ABSTRACTS
SA HEART® CONGRESS 2019

Integrating the prevention and control of rheumatic heart disease into country health systems: A systematic review

Jessica Abrams*, Mark Engel#, David Watkins†, Leila Abdullahi* and Liesl Zühlke‡

*Department of Paediatrics and Child Health, University of Cape Town, Rondebosch, South Africa. #Department of Medicine, University of Cape Town, Rondebosch, South Africa. †Department of Medicine, University of Washington, Seattle, Washington, United States of America. ‡Red Cross War Memorial Children's Hospital and the University of Cape Town, Rondebosch, South Africa

Introduction: Rheumatic heart disease (RHD), a sequel to StrepA pharyngitis and acute rheumatic fever (ARF), is a significant cause of morbidity and mortality amongst disadvantaged populations. Following a 2018 World Health Assembly Resolution on RHD, an evidence-based approach is needed to guide the implementation of RHD programmes which are integrated into national health systems. We assessed the effectiveness of programmes targeting RHD prevention and control according to the extent and nature of integration into the health system, with a view to inform best practice and identify key knowledge gaps.

Methods: We searched electronic databases and grey literature, complemented by hand searching, in order to identify studies reporting on prevention and control programmes for populations at risk for StrepA pharyngitis, ARF and/or RHD. Eligible studies were published in English between 1990 and 2017. RHD programme integration was analysed according to an established framework. Programme effectiveness data were extracted and analysed using a results-chain framework. A meta-analysis was performed on secondary prophylaxis adherence. The quality of studies was assessed using peer-reviewed checklists (CASP and PRISM).

Results: The search yielded 658 publications, from which 5 observational studies met with the inclusion criteria. Studies were similar in extent and nature (health system function). None of the programmes was completely integrated, or non-integrated. A single study reported on the impact of the programme. Secondary prophylaxis adherence improved amongst partially integrated RHD programmes (RR, 1.18 [95% CI, 1.03 - 1.36], 3 studies, n=618). Risk of bias was low in 2 studies, and indeterminable in the remaining 3.

Conclusion: There is evidence that partially integrated RHD programmes are beneficial for a number of study outcomes. This review provides a starting point for the design and implementation of future RHD programmes by outlining current best practice for integration and identifying key gaps in knowledge.

Infective endocarditis at Dr George Mukhari Academic Hospital: Correlating echocardiography findings with intra-operative findings

Jamila Khatoon Adam* and Musawenkosi Henema#

*Durban University of Technology, KwaZulu-Natal, Durban, South Africa. #Dr George Mukhari Academic Hospital, Ga-Rankuwa, Pretoria, South Africa

Introduction: Infective endocarditis is a serious disease associated with poor prognosis, despite improvements in medical and surgical therapies. The project aimed to compare echocardiographic findings (transthoracic echocardiographic TTE) with intra-operative findings in patients with infective endocarditis.

Methods: The cohort consisted of 40 patients with infective endocarditis. Two techniques were used to assess the infective endocarditis: echocardiography and intra-operative findings (visual and histology). Blood samples were cultured to demonstrate the presence of micro-organisms. The researcher performed an echocardiogram to assess: which valve was affected, the left ventricular endiastolic diameter, the left ventricular ensystolic diameter, the shortening fraction, the ejection fraction and the size of the vegetation/mass or abscess. For patients requiring heart surgery, the cardiac surgeon performed the valve replacement and the intra-operative findings were assessed visually to confirm the presence of vegetation or abscess and leaflet destruction. During the operation a biopsy sample was taken for histological examination to confirm the presence of vegetation or abscess. The researcher was blinded to the findings in the theatre.

Results: The histology confirmed echocardiographical and intra-operative findings. The intra-operative and echocardiography findings showed: 80% vegetation, 5% perforation, 10% pseudo-aneurysms and 5% abscesses. The prognosis of patients with poor ejection fraction (40% - 50% EF) was poorer than those with good ejection fraction. The clinical findings of all patients confirmed infective endocarditis, 80% blood cultures were positive and 20% were negative. There were 17.5% patients who showed poor correlation and 82% patients showed moderate correlation between echocardiographical and post-operative findings.

Conclusion: A total of 20% had stenosis and 32% of 80% of patients who had infective endocarditis, had regurgitation. There was an overall moderate association (r=0.68) between echocardiography and intra-operative findings in all patients for LVES.

Use of single pill combination anti-hypertensive medications in a tertiary health institution cardiology clinic in Nigeria

Ojonojima Ajanya, Dike Ojji, Augustine Odili, Jacob Alfa, Bolaji Abdullahi, Ada Nwankwo, Anita Nnamonu, Taiwo Adedokun, Moses Durotoluwa and Henry Oshaju

University of Abuja Teaching Hospital, Gwagwalada-Zuba, Gwagwalada, Nigeria

Introduction: The majority of patients with hypertension require 2 or more medications to provide adequate blood pressure (BP) control. In addition, contemporary guidelines on the management of hypertension favour the use of single pill combinations (SPCs) as they simplify the treatment regimen and decrease the daily pill burden for patients, both of which are associated with improved adherence. In spite of this, no study in our context has assessed the proportion of patients on SPC anti-hypertensive therapy.

Methods: We prospectively collected detailed clinical data from 373 patients with a primary diagnosis of hypertension attending the University of Abuja Teaching Hospital cardiology clinic between 2016 and 2017.

Results: A total of 373 patients, with a mean age of 50.6 ± 12.3 years and mean body mass index of 31.2 ± 6.5kg/m^2 on anti-hypertensive treatment were evaluated. Baseline mean systolic and diastolic BPs were 161.1 ± 3.1mmHg and 95.4 ± 15.6mmHg, respectively. Mean pulse pressure was 56.6 ± 18.1mmHg. A total of 212 (56.8%) patients were on a single pill combination, with 32.5% on angiotensin receptor blocker (ARB) plus hydrochlorothiazide (HCT), 18.9% on angiotensin converting enzyme inhibitors (ACEIs) plus HCT, 9.9% on amlodipine (AML) plus ARB, 3.3% on AML plus ACEI, 3.8% on thiazide-like diuretic plus atenolol, 29.2% on HCT plus amiloride and 2.4% on a triple combination of AML+ARB+HCT.

Conclusion: Our study showed that over 50% of our patients were on single pill combination anti-hypertensive medications.

A descriptive study of adult mitral valve disease at a tertiary referral centre

Ebrahim Banderker*, Merika Tsitsi# and Ruchika Meel#

*Gauteng Department of Health, Johannesburg, South Africa. #Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: There is limited literature regarding the current clinical characteristics of patients with mitral valve disease (MVD). Therefore, this study aimed to systematically document the clinical and demographic characteristics of patients with MVD.

Methods: This was a cross-sectional descriptive sub-study to a larger ongoing study on valvular heart disease (VHD) at the Chris Hani Baragwanath Academic Hospital (CHBAH) valve clinic. All data were extracted from clinic files and a preliminary analysis of data regarding patients with MVD was performed.

Results: The study comprised 134 patients with MVD. The mean age was 50 ± 13.3 years with 77% being females. The majority were of African ethnicity (96%). Most patients were in New York Heart Association functional class II (54%). The predominant mitral valve lesion was mitral regurgitation (39%) followed by mixed mitral valve disease (38%) and mitral stenosis (23%). The main aetiology of MVD was rheumatic heart disease (80%), mitral valve prolapse was noted in 11%, myxomatous and degenerative disease was present in 5%. Infective endocarditis was noted in 3%. Severe MVD was present in 51% of patients. Thirty percent of the patients had concomitant involvement of other valves. The main co-morbidities were hypertension (30%) and HIV (12%). The main reason for initial hospitalisation was heart failure (78%). Twenty two percent had recurrent admission for heart failure (HF). Ninety four percent of patients were on HF treatment. Fourteen patients were on rheumatic fever prophylaxis. None of the patients presented for surgery had coronary artery disease (75%). MVD was complicated with pulmonary hypertension (28%) and atrial fibrillation (14%) in 57 patients.

Conclusion: Mitral valve disease is common at CHBAH. The current patients tend to be older females with co-morbidities. The majority of patients presented in HF. The predominant aetiology was chronic rheumatic heart disease and acute rheumatic fever was rare.

Molecular typing of non-invasive group A streptococcal infection at Groote Schuur Hospital, Cape Town

Dylan Barth*, Preneshni Naicker#, Kelin Engel#, Babu Muhamed#, Bongani Mayosi#, Jim Dale† and Mark Engel#

*Telethon Kids Institute, Perth Children's Hospital, Perth, Australia. #Department of Medicine, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa. †University of Tennessee, Tennessee, United States of America

Introduction: Group A streptococcus (GAS) is responsible for a wide range of non-invasive (non-iGAS) and invasive group A streptococcal (iGAS) infections and continues to be a major cause of premature death and morbidity. Primary prevention strategies have focused on the development of a vaccine; the most advanced being a 30-valent vaccine. We aimed to describe the molecular characteristics of iGAS isolates, particularly in respect to how they compare and contrast with non-iGAS isolates. We also sought to investigate the potential coverage from the putative M-protein vaccine.

Methods: We conducted a prospective passive surveillance laboratory study, from February 2016 - March 2017, amongst samples submitted to the National Health Laboratory Service (NHLS) from patients attending public health facilities in Cape Town. We documented demographic data, clinical presentation, laboratory data and emm types which cause non-iGAS and iGAS infections. The study was approved by the UCT HREC (R006/2015).

Results: GAS was commonly isolated from pus swabs, blood, deep tissue and aspirates. Common clinical presentations included: wound infections (20%), bacteraemia (15%), abscesses (9%) and septic arthritis (8%). Two-hundred and thirty-three isolates were available for emm typing, from which 46 different emm types were identified. The most prevalent emm types were: M76 (16% of isolates), M81 (10%), M80 (6%), M43 (6%) and M183 (6%) and these were almost evenly distributed between non-iGAS and iGAS isolates. Vaccine coverage for non-iGAS and iGAS infection in our setting was 60% and 59% respectively, notably lower than coverage in developed countries. Four of the most prevalent emm types are not included.

Conclusion: Emm-types from GAS isolated from patients with iGAS did not differ significantly from those isolated from non-iGAS cases. Furthermore, this research indicates a potentially low coverage of the M-protein vaccine in our setting and emphasises the need for a reworking of the potential vaccine formulation to improve coverage in high burden settings.

The missing piece study: A surveillance study for Strep A pharyngitis and Impetigo in the Kimberley, Australia

Dylan Barth*, Neomie Dickerson*, Robyn Macarthur#, Coco Chou†, Marianne Mullane*, Jonathan Carapetis* and Asha Bowen*

*Telethon Kids Institute, Perth Children's Hospital, Perth, Australia. #Derby Aboriginal Health Service, Derby, Western Australia. †Princeton University, New Jersey, United States of America.

Introduction: Acute rheumatic fever (ARF) is the most common cause of acquired heart disease in childhood. Although a causal pathogenic pathway has been confirmed between pharyngitis and subsequent ARF, a plausible link has been proposed between Strep A Impetigo and ARF. This hypothesis is supported by high rates of ARF in Australian Aboriginal populations where Impetigo is endemic and Strep A pharyngitis rare. A key piece of missing evidence is the documentation that Strep A pharyngitis is truly rare. We aimed to evaluate the concurrent burden of Strep A pharyngitis and Impetigo in Aboriginal children (5 - 15 years) in the Kimberley, Western Australia.

Methods: This school-based study in 2 remote schools is designed to collect clinical, serological, microbiological and molecular data on Strep A pharyngitis and Impetigo in Australia. This study comprised 2 components: (a) Screening the entire consented population 3 times per year and (b) weekly surveillance for symptomatic pharyngitis and Impetigo. Surveillance included: a history, clinical examination, photographs, swabs and a dried blood spot specimen for Anti-Streptolysin O titres (ASOT). All swabs were cultured for isolate identification, followed by characterisation of the molecular epidemiology using whole genome sequencing (WGS) to determine the vaccine coverage of the 30-valent vaccine formulation. Preliminary results are reported from screening visit 1.

Results: We enrolled 124 children; 76 male (61%) and 62 (50%) identified as Aboriginal. The prevalence of sore throat and skin sores were 10% (n=13) and 27% (n=33), respectively. Fifty one percent (n=52) of the children had an ASOT reading of >200 IU. Throat swabs (n=118) and skin swabs (n=39) will undergo laboratory and molecular evaluations.

Conclusion: This work has important implications for guidelines and policies targeting primary prevention of Strep A infections driving high rates of ARF and RHD in Australian Aboriginal children. We anticipate our sequencing results of Strep A will further contribute to informing vaccine initiatives.

Comprehensive needs assessment for arterial hypertension management cascade at an urban hospital in a low-income country

Neusa Bay*, Edna Juga#, Ana Olga Mocumbi#, Carlos Macuacua†, José João† and Maria Helena da Costa‡

*MIHER Mozambique Institute for Health Education and Research, Maputo, Mozambique. #Instituto Nacional de Saúde, Maputo, Mozambique. †Universidade Eduardo Mondlane, Maputo, Mozambique. ‡Hospital Geral de Mavalane, Maputo, Mozambique

Introduction: Hypertension is the leading preventable risk factor for premature death and disability worldwide, but global hypertension disparities are large and have been increasing. Despite Mozambique's increasing trend in prevalence, the levels of awareness, treatment and control are low. Our study aimed to describe the hypertension care cascade and identify gaps in availability and affordability of services for its control.

Methods: From September 2018 - December 2018 we conducted a needs assessment of hypertension care provision at a first-referral urban hospital in Mozambique's capital. Questionnaires, surveys and guides for direct observation of services were developed based on merging and adapting the Package of Essential NCD interventions for primary health care in low-resource settings (PEN), the Service Availability and Readiness Assessment (SARA) and the lean healthcare (LHC) approach.

Results: We found critical gaps in human resources, clinical equipment, diagnostics and medicine availability. Less than 2% of adults were diagnosed as having hypertension (2 464/159 303) of which 21.4% (527.3) were severe and complicated. No flow according to hypertension severity, nor an integrated chronic case management system existed. There were long patient waiting times for first evaluation, blood collection, chest x-ray and medicine dispensing, requiring at least 5 hospital visits. Availability of medicines recommended by the national medicines list was 12.82% on average. Patients spent up to 24.4% of their monthly wage to purchase one single medicine, equivalent to approximately 8 days of work. Lack of surveillance systems and irregular supply chains were also major barriers to hypertension control.

Conclusion: Health facility readiness to address arterial hypertension in this highly prevalent urban setting in Mozambique was low, with marked unavailability of trained health professionals, clinical equipment, diagnostics and medicines. Low medicines affordability, lack of guidelines and absence of efficient supply chain were major barriers to care. Health facility quality improvement measures are recommended.

Heart catheterisation in adults in a sub-Saharan tertiary centre: An 8-year experience

Tantchou Tchoumi Cabral, Jean Claude Ambassa and Charles Mvondo

Cardiac Centre Shisong, Kumbo, Cameroon

Introduction: The goal of the investigation was to analyse the results of heart catheterisation in the Shisong Cardiac Centre from December 2010 - December 2017.

Methods: This retrospective study was done at the Shisong Cardiac Centre in adult patients who had undergone a procedure in the catheterisation laboratory from December 2010 - December 2017.

Results: Three hundred and sixty-five adult patients underwent cardiac catheterisation during the study period, 126 female and 239 male. The mean age at presentation was 52.6 ± 12.9 years. Patients hailed from neighboring countries: Nigeria n=5 (1.3%), Tchad n=3 (0.8%), Equatorial Guinea n=4 (1%) and Democratic Republic of Congo n=2 (0.5%). Patients also came from all 10 regions in Cameroon: Littoral n=122 (33.2%), Centre n=127 (34.8%), North-West n=47 (12.9%), South-West n=17 (4.5%) , West n=26 (7.1%), North n=7 (1.8%), Adamaoua n=8 (2.1%), Far North n= 5 (1.3%), South n=2 (0.5%) and East n=4 (1%). Diagnostic coronarography (in cases where coronary artery disease was suspected) and presurgical coronarography were the main procedures performed in 171 (46.8%) and 146 patients (40%), respectively. Diagnostic coronarography was positive in 31 cases (8.4%). In patients with ischaemic heart disease, percutaneous intervention with dilatation of the coronary arteries and implantation of stents was done in 19 cases (5.2%). The remaining 12 cases (3.2%) were mainly lesions that could be addressed by coronary artery grafting surgery alone. These procedures were all performed successfully. In grown-up congenital heart disease patients, diagnostic catheterisation was done in 48 cases, interventional catheterisation namely pulmonary artery valvuloplasty, patent ductus arteriosus closure, atrial septal defect closure and decoarctation of the aorta were done in n=11 (3.4%), n=9 (2.4%), n=12 (3.2%), n=6 (1.6%) cases, respectively.

Conclusion: Coronary heart disease was confirmed by angiography in 8.4% cases and amongst adult congenital heart disease patients, atrial septal defect was the pathology most often managed. Heart catheterisation at the Shisong Cardiac Centre is performed with good results.

Symptomatic children with post-rheumatic valvulopathies in natural history: A 5-year follow-up

Tantchou Tchoumi Cabral and Jean Claude Ambassa

Cardiac Centre Shisong, Kumbo, Cameroon

Introduction: The aim of the study was to investigate the pattern of valvular lesions, the mortality and the challenges in a 5-year follow-up of symptomatic children with post rheumatic valvulopathies in natural history in St. Elizabeth Catholic General Hospital cardiac centre.

Methods: This retrospective analysis included 95 patients, aged between 5 and 16 years, who could not have surgery done in the cardiac centre from July 2008 - July 2013. Data from patients' records, 2-dimensional echocardiographic studies and electrocardiograms were reviewed. Patients and their families were contacted every 6 months. The duration of the follow-up was 60 months.

Results: The 95 symptomatic patients were aged between 5 and 16 years old with a mean age of 12.4 ± 4.5 years. Mitral regurgitation was the most common echocardiographic diagnosis present in 51.7% patients; 13.3% patients had mixed mitral valve disease and 35% had pure mitral stenosis. Pulmonary hypertension was the most common echocardiographic complication of the disease in 87% of cases. Clinically, complications of the disease included: congestive heart failure, fatigue, growth retardation and sudden death. On presentation, 78% of cases were admitted. Mortality in 2 years was 55% and in 5 years 75%.

Conclusion: Post-rheumatic mitral valve regurgitation is the pathology most commonly encountered. Pulmonary hypertension is the most common echocardiographic complication of the disease. In our setting, 5-year mortality is very high.

Prevalence of erectile dysfunction amongst ambulant hypertensive males at a tertiary level hospital in Kenya

Malcolm Correia[*], Elijah Ogola[#], Joshua Kayima[#], Mark Joshi[#] and David Silverstein[*]

[*]The Nairobi Hospital, Nairobi, Kenya. [#]University of Nairobi, Nairobi, Kenya

Introduction: Hypertension affects 22% of the world's population and is a risk factor for cardiovascular disease (CVD) including stroke and coronary artery disease (CAD) in relation to atherosclerosis. The underlying pathophysiological link between hypertension and vasculogenic erectile dysfunction (ED) is endothelial dysfunction. The common risk factors for ED and atherosclerosis include: hypertension, age, cigarette smoking and hazardous alcohol consumption. The aim of this study was to investigate the prevalence of ED, cigarette smoking and alcohol consumption and explore their correlation and associated risk factors amongst male hypertensive patients.

Methods: In this hospital-based cross-sectional study done over 7 months, 385 hypertensive males, aged 30 - 70 years on follow-up at Kenyatta National Hospital out-patient clinic for at least 1 month, were consecutively recruited. Patients with diabetes, genital abnormalities, on phosphodiesterase or sex hormone therapy, advanced chronic kidney, liver disease and heart failure were excluded. A targeted clinical history was taken and physical examination, including anthropometric measurements, was performed and data entered into standardised questionnaires. The IIEF-5 questionnaire was used to determine the prevalence of ED using 95% confidence interval. Logistic regression analysis was used to explore for factors associated with ED.

Results: A total of 385 participants were recruited with mean age 56.7 years (SD 11.3). ED prevalence was 94.5% (95% CI 92.2 - 96.6%), most of which was mild in severity (70.1%). ED prevalence showed no correlation with age, hypertension duration, cigarette smoking, alcohol consumption, weight, waist-hip ratio or class of anti-hypertensive agent.

Conclusion: We document a high prevalence of ED amongst male hypertensive, non-diabetic population, in this index study. ED is an early marker of atherosclerotic disease and it therefore suggests a high cardiovascular risk. Detection of ED is important for optimal individual cardiovascular disease risk stratification and management with the potential for improved anti-hypertensive adherence.

Prevalence of peripheral arterial disease amongst ambulant hypertensive males at a tertiary level hospital in Kenya

Malcolm Correia[*], Elijah Ogola[#], Joshua Kayima[#], Mark Joshi[#] and David Silverstein[*]

[*]The Nairobi Hospital, Nairobi, Kenya. [#]University of Nairobi, Nairobi, Kenya

Introduction: Hypertension affects 22% of the world's population and is a risk factor for cardiovascular disease including stroke and coronary artery disease. The common risk factors for peripheral arterial disease (PAD) and atherosclerosis include: hypertension, age, cigarette smoking and hazardous alcohol consumption. The worldwide prevalence of PAD is estimated to be up to 29% and is an independent risk factor for cardiovascular morbidity and mortality. The aim of this study was to investigate the prevalence of PAD, cigarette smoking and alcohol consumption and explore their correlation and associated risk factors amongst male hypertensive patients.

Methods: In this hospital-based cross-sectional study done over 7 months, 385 ambulant hypertensive male patients at the Kenyatta National Hospital on follow-up in the medical outpatient clinics were enrolled consecutively in the study by convenience sampling after informed consent had been obtained. A targeted clinical history, physical examination and anthropometric measurements were obtained by standard procedure and data were entered into questionnaires. PAD was determined using the ankle brachial index.

Results: The prevalence of PAD was 49.9% (95% CI 44.7 - 55.1%), increasing above 50 years of age. History of smoking had a prevalence of 54.2% and was associated with a nearly 2-fold risk of PAD (OR 1.8 [95% CI 1.2 - 2.7], p=0.005). Fourteen percent of patients displayed histories of hazardous alcohol consumption showing a protective benefit in PAD (OR 0.6), but not deemed statistically significant. The duration of hypertension from diagnosis was not significantly associated with PAD. An elevated waist-hip ratio was noted to be protective with an OR 0.4 (95% CI, p<0.001) in PAD.

Conclusion: There is an increased prevalence of PAD amongst the male hypertensive, non-diabetic population. These findings may be used to justify the assessment for PAD for early detection, prevention and management in order to prevent the progression of PAD and improve quality of life.

Challenges to addressing the knowledge gap on neglected cardiovascular diseases through community-based studies: Exploring endomyocardial fibrosis

Basilio Cumbane, Jenisse Jonas, Rolando Jive and Ana Mocumbe

MIHER Mozambique Institute for Health Education and Research, Maputo, Mozambique

Introduction: Despite ongoing globalisation, a huge gap still exists between developed and developing countries in terms of health disease research. This is even more evident for cardiovascular diseases viewed within the context of steady globalisation, point-of-care devices and internet accessibility. Amongst the developing world countries, sub-Saharan Africa has a huge deficit of accurate and well-defined health data to inform policy making and care provision planning, in particular for neglected cardiovascular diseases. Endomyocardial fibrosis (EMF) is the most common restrictive cardiomyopathy worldwide. It is characterised by the deposit of fibrous tissue in the endomyocardium, leading to progressive heart failure and death, if left untreated. Efforts to understand EMF pathogenesis and natural history are slow in endemic areas for this condition with a small number of original researches undertaken up to date. Moreover, community-based research in endemic areas is lacking due to a shortage of expertise and material resources to undertake it.

Methods: Descriptive research based on a case study of community-based research in an endemic area in southern Mozambique. The research aim was to acquire a deeper knowledge regarding current challenges being faced. Lessons learned are discussed to help improve future implementation of similar studies in Mozambique and other areas. We support our case study with a literature review on recent advances and perspectives in diagnosis and managements of EMF.

Results: The prevalence of EMF in a rural area of Mozambique was almost 20%. This shows that echocardiographic screening facilitates the sensitivity and precision of diagnosis by an early detection of the disease in asymptomatic individuals.

Conclusion: EMF has a higher prevalence in rural poor communities in Mozambique. Despite geographical and administrative challenges to conducting these studies, recent advances in medicine (such as point-of-care diagnostics, heart failure biomarkers and new imaging techniques) have opened new perspectives for high quality research through collaborative partnerships and regional initiatives.

First degree atrioventricular block is associated with troponin T release and hypertrophic remodelling in males with African ancestry: The SABPA study

Rhena Delport*, Madelein Griffiths# and Leone Malan#

*University of Pretoria, Pretoria, South Africa. #Hypertension in Africa Research Team (HART), North-West University, Potchefstroom, South Africa

Introduction: First degree atrioventricular block (1oHB) is most commonly observed in males with African ancestry and may increase cardiovascular risk. The clinical relevance of 1oHB is investigated to establish associations with race, atherosclerosis and myocardial injury.

Methods: A target-population study included a bi-racial cohort (n=385) with similar socio-economic status (African ancestry/Blacks: n=179, European ancestry/Whites n=206, aged 20 - 65 years). Ambulatory 24-hour blood pressure (BP) and electrocardiogram (ECG), 10-lead ECG and fasting blood samples were obtained. High-sensitivity cardiac troponin T (cTnT) was deemed to reflect the degree of myocardial injury and remodelling or emergent atherosclerosis. B-mode ultrasound images of the left carotid intima-media thickness of the far wall (L-CIMTf) and left cross-sectional wall area (L-CSWA) were obtained as measures of subclinical atherosclerosis.

Results: First degree atrioventricular block was observed in 39% of all males and 2% of white females. Accumulative CAD burden was observed in Blacks, evidenced by concurrent hypertension and 1oHB (23%) compared with Whites (7%), and in addition, a higher number of silent myocardial

ischaemic events as well as a higher degree of L-CIMTf remodelling (p≤0.05). Significant positive associations were observed only in the sub-group of Black males with 1oHB between L-CIMTf and cTnT [Adj. R2=0.36; ß=0.46 (0.17; 0.75), p≤0.05] as well as L-CSWA and cTnT [Adj. R2=0.30; ß=0.42 (0.12; 0.71), p≤0.05].

Conclusion: Subclinical atherosclerosis was associated with cTnT release in Black males with prevailing 1oHB, suggesting increased susceptibility for hypertrophic remodelling and/or ischaemic heart disease in this race group. These findings support concerns expressed regarding 1oHB and adverse cardiovascular outcomes and mortality.

Evaluation of life-threatening chest pain in a resource-poor setting

Alfred Doku and Mark Tettey

School of Medicine and Dentistry, University of Ghana, Accra, Ghana

Introduction: Chest pain is a common symptom encountered at emergency departments worldwide. An estimated 25% of the general population experience chest pain during their lifetime, some of which heralds a life-threatening cardiovascular disease (CVD). Cardiovascular diseases are leading causes of death in adult Africans and can present as chest pain. Prompt identification of underlying cause/s of chest pain is essential to avoid delay and fatal misdiagnosis. In resource-poor clinical settings, as seen in Africa, evaluation of life-threatening chest pain is important to shape clinical practise and policy and to direct resource allocation. This study evaluated the occurrence of life-threatening chest pain in Accra, Ghana.

Methods: This was a cross-sectional study done at the emergency departments of 2 leading tertiary hospitals, the Korle Bu Teaching Hospital and the 37 Military Hospital, in Accra, Ghana. Consecutive adult patients, aged 18 years and older, presenting with acute chest pain at the emergency departments between April and June 2018, were enrolled in the study. Descriptive and cross-tabulation analysis was performed. The results were presented in tables and graphics.

Results: Two hundred and twenty-seven patients presented with acute chest pain at the emergency department of the 2 tertiary hospitals during the study period. The mean age of patients was 55.0 ± 17.2 years. Life-threatening conditions presenting with chest pain occurred in 89 (39%) patients and included: acute coronary syndrome (68.5%), acute left ventricular failure (16.9%) and pulmonary embolism (12.4%) and acute chest syndrome (2.2%). Seventy percent presented 24 hours after onset of life-threatening chest pain and only 7.8% arrived in an ambulance. None of the pulmonary embolism patients had a CT pulmonary angiogram done and only 5 (8.2%) acute coronary syndrome had a coronary angiogram.

Conclusion: Life-threatening chest pain is common and associated with delayed presentation at the facility level. Emergency pre-hospital care is not well developed, the non-affordability and low availability of modern care facilities hamper proper care of patients.

Clinical assessment and outcome of chest pain in a sub-Saharan African setting

Alfred Doku and Mark Tettey

School of Medicine and Dentistry, University of Ghana, Accra, Ghana

Introduction: Pre-hospital care response teams as well as structured protocols for the assessment of chest pain are absent in most African countries. Delayed presentation and poor clinical assessment lead to adverse outcomes in patients with chest pain. We sought to characterise the epidemiology and clinical process of assessing patients presenting with acute chest pain to the 2 leading tertiary care centres in Accra, Ghana.

Methods: A structured questionnaire was administered to extract demographic data and clinical details of patients with chest pain.

Results: There were 4 607 patients (55.0 ± 17.2 years) who presented to the emergency units. Acute chest pain prevalence was 4.9%. Public transport (46%) was the most common means of transportation, the ambulance service was used in only 3.4% of cases. Acute coronary syndrome (ACS) was the leading source of acute chest pain (26.9%) followed by gastroesophageal reflux disease GERD (22.9%). Investigation of acute chest pain did not often follow best practice guidelines.

Conclusion: There has been a shift in the epidemiology of acute chest pain in Ghana. Efforts to increase physician awareness and best practices are urgently required.

Identifying risk factors for failure of radial artery access during coronary angiography in a South African population

Rudolf du Toit [*] ***and Jacques Doubell*** [#]

[*]Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. [#]Stellenbosch University and Tygerberg Hospital, Bellville, South Africa

Introduction: Radial artery (RA) access is preferred to femoral access for coronary angiography but it poses a greater technical challenge with unique complications. It may require multiple puncture attempts, has a higher cannulation failure rate and can be complicated by radial artery spasm (RAS), radial artery pulsation loss (RAPL) and radial artery occlusion (RAO). Predictors of radial artery access failure include the size of the radial artery with higher failure rates in small individuals and females.

Methods: Patients undergoing coronary angiography via RA access at Tygerberg Hospital from April 2017 - July 2018 were recruited. The RA was assessed by ultrasonography before and after the procedure. All ultrasound assessments were performed with a GE Logiq E (22MHz probe). The RA diameter was measured 2 - 5cm proximal to the styloid process. During the procedure the number of puncture attempts, cannulation success and RAS were recorded. Post procedurally the RA was assessed by ultrasound for local complications and patency assessed clinically and by ultrasound.

Results: A total of 1 156 patients were included. The mean RA diameter prior to cannulation was 2.28mm (+ 0.47mm). The mean number of puncture attempts was 2.64 (+12.79). Cannulation success was high (95.8%) with low complication rates (RAS 4.4%, RAPL 4.2% and RAO 4.8%). A negative correlation was found between the pre-procedural RA diameter and the number of puncture attempts (Spearman's rho -0.173, p<001). Females were found to have a significantly smaller radial artery diameter than males with a mean of 2.05mm (+0.39mm) in females compared to 2.41mm (+0.46mm) in males (p<0.001). There were also significantly more radial artery puncture attempts in females compared to males (p=0.001) as well as higher cannulation failure rates in females (7.3%) when compared to males (2.6%) (p<001). Patients with hypertension had significantly more radial artery puncture attempts (p=0.047). Diabetes Mellitus (p=0.038) and dyslipidaemia (p=0.35) were also associated with more radial artery puncture attempts.

Conclusion: RA size in the South African population is similar to that seen in the rest of the world. In experienced centres the success rate for RA access is high with low complication rates. RA diameter is a predictor to RA cannulation success and should be taken into consideration when performing trans-radial coronary angiography, particularly in hypertensive, dyslipidaemic and diabetic females.

The South African SHARE-TAVI registry: Incidence and risk factors leading to conduction disturbances requiring permanent pacemaker implantation

Rudolf du Toit [*]***, Hellmuth Weich*** [*]***, Anton Doubell*** [*] ***and the SHARE-TAVI contributors Elizabeth Schaafsma*** [#]

[*]Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. [#]SHARE Registry, SA Heart® Association, Tygerberg Hospital, Bellville, South Africa

Introduction: Transcatheter aortic valve implantation (TAVI) has been implemented successfully in South Africa, the first case performed in 2009. The SHARE-TAVI registry, established in 2014, monitors VARC-2 (Valve Academic Research Consortium-2) clinical endpoints. One of these endpoints, the most common complication post TAVI, is the development of heart block requiring permanent pacemaker implantation (PPI). The incidence of PPI in international registries ranges from 13% - 17.5%. No data from Africa on PPI has been published to date.

Methods: The aim of this observational study was to report the PPI rate in the SHARE-TAVI registry and determine the clinical, electrocardiographic and procedural predictors of PPI. This was done by analysing the registry data and performing a folder review, including detailed recording of pre- and post-procedural electrocardiographic parameters.

Results: A total of 305 subjects from both the public and private sectors were analysed. The PPI rate was 9%. Third degree atrioventricular block at the time of implant was the most common indication for PPI. No clinical predictors of PPI were found. Procedurally, self-expanding valves (PPI rate 14% vs. 6% for balloon-expanding valves, p=0.02) and valve size were correlated with the need for PPI. Baseline ECG predictors of PPI were axis deviation, QRS duration and conduction delay, most notably a pre-existing right bundle branch block. PPI did not influence functional class, need for repeat hospitalisation or mortality at 30-day and 1-year follow-up.

Conclusion: A PPI rate lower than that reported in large international registries was found. Predictors of PPI and the influence PPI on outcomes were similar to those reported in international data.

Association of diabetes and arterial hypertension in an elderly Moroccan population

Monia El Mourid, Zakaria Qechchar, Fatima Ez-zahraa Talhi, El Mehdi Aqli, Leila Azzouzi and Rachida Habbal

Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: The combination of hypertension and diabetes is particularly common in elderly people. It is responsible for an increase in cardiovascular risk and can cause early damage to degenerative diabetes. This study focused on the epidemiological, clinical and biological characteristics of a population of patients with associated hypertension and diabetes.

Methods: A prospective and descriptive study of 321 patients, including 120 with a hypertension and diabetes combination, aged 65 years or older, presenting at the cardiology department of Ibn Rochd University Hospital in Casablanca, from June 2015 - April 2017.

Results: The mean age of our patients was 68.3 ± 3.1 years, with a clear female predominance (89.3%). The diagnosis of diabetes preceded that of hypertension in 42.7%. Sixty percent of patients had Grade I hypertension. Mean BMI was 28.1 ± 4.6kg/m^2. Dyslipidemia was present in 56.7% of our patients with mainly hypo HDLemia (82%) and hyper LDLemia (57%). Macrangiopathy was found in 52% of patients dominated by the occurrence of ischaemic heart disease in 32%. It was significantly more common in patients with LDL-c ≥1g/l and hypoHDLemia. The microangiopathy present in 73% of cases was significantly related to hyperglycemia, glomerular filtration rate and triglyceride levels.

Conclusion: The population of hypertensive and diabetic patients is a relatively frequent population exposed to cardiovascular complications, headed by ischaemic heart disease. Hence the interest in full management from the moment of diagnosis of diabetes and hypertension to the prevention of cardiovascular risk and specific therapy.

Is obesity a prognostic risk factor in pulmonary embolism? A Moroccan experience

Monia El Mourid, Fatima Ez-zahraa Talhi, Zakaria Qechchar, Salma Zenouaki and Leila Azzouzi

Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: Obesity is associated with many cardiovascular risk factors which could trigger venous thrombo-embolism such as venous stasis and decreased mobility. Its prevalence is rapidly increasing, not only in developed countries but across the world. It has been demonstrated as an independent risk factor to pulmonary embolism (PE). However, only few studies have investigated this parameter as a prognostic factor in PE. We suggest that obesity could be associated with a worst clinical presentation, echocardiographic parameters, prognosis and mortality.

Methods: This prospective study was conducted with 120 patients admitted for PE to the cardiology intensive care unit at Ibn Rochd University Hospital in Casablanca, Morocco, between January 2016 and December 2018. We divided our patients into: G1 with obesity (BMI >30kg/m^2) and G2 without obesity (BMI <30g/m^2). We compared clinical features, echocardiography characteristics and prognosis.

Results: Mean age was 54.3 ± 16.77, sex ratio=0.3. G1 represented 28%. Clinically, 56% in G1 vs. 43% in G2 had dyspnea, 20% vs. 10% had oedema, 12% vs. 2% had hemoptyisis and 10% vs. 3% presented with signs of cardiogenic shock (p<0.001). Rhythm disorders were not more frequent than in G2. Diagnosis was assessed by echocardiography and thoracic angio scanner. An intracavity thrombus was found in 8% vs. 2%, right ventricular dysfunction in 24% vs. 15% (p=0.016). Paradoxal septum and pulmonary hypertension occurred in more than 56% of G1 vs. 34% in G2 (p=0.004). Thrombolysis was used in 4% of G1 and not done in G2 (p<0.001). Treatment with non-fractional heparin and oral anticoagulation was initiated in all the other patients without any difference being noted in the 2 groups. Mortality occurred in 3% of G1 vs. 1% of G2 (p>0.01).

Conclusion: In our study, obese patients were more symptomatic, had more echocardiographic signs of pulmonary embolism and presented more cardiogenic shock than the non-obese group. However, mortality was not significantly more prevalent.

Persistent pre-eclampsia: A survey of Moroccan women

Monia El Mourid[*], Fatima Ez-zahraa Talhi[*], Zakaria Qechchar[*], Hind Tahri[*], Asmaa Assal[†], Houcine Boufettal[#], Leila Azzouzi[*] and Rachida Habal[*]

[*]Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco. [#]Gynaecology Department, Ibn Rochd University Hospital, Casablanca, Morocco. [†]Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: Pre-eclampsia (PE) is a combination of pregnancy-induced hypertension (≥140/90mmHg) and proteinuria greater than or equal to 300mg per 24 hours above 20 weeks of amenorrhea. It usually disappears within 24 - 48 hours after delivery. However, it can persist after placental evacuation and up to 6 weeks after delivery.

Methods: This is a retrospective study of 547 cases of PE collected in the Gynaecology and Obstetrics C department of Ibn Rochd Hospital, Casablanca, for a period of 3 years (2016 - 2018). Two groups were identified. In Group 1 (n=504) PE immediately disappeared in the postpartum and a Group 2 (n=43) PE persisted. We tracked patients' progress, before and after delivery.

Results: PPE represented 8%. Mean age was 29.15 ± 15.13 years, with a prevalence of 72% between 25 and 35 years, age >35 years was a factor of disappearance of PPE. Factors related to the persistence of pre-eclampsia were mainly: pauciparity in 61%, history of PE in 4.7%, gestational age <36 weeks in 56%, severe PE in 14.7%, hypotrophy in 6%, eclampsia in 2% and massive 24 hours proteinuria ≥3mg/24h in 60% (all p were <0.001%) in comparison with Group 2 . The clinical examination showed blood pressure >160/110mmHg in 20.4%, SBP >170mmHg in 13%, DBP >110 mmHg in 9%. Oedema was present in 70%. A vaginal delivery was done in 44% of cases, caesarean section was recommended in 56% of cases. Conservative treatment was adopted in 22% of cases; 15.05% required immediate use of intravenous antihypertensive treatments.
Conclusion: PE is still common in developing countries. It remains a major cause of maternal and foetal morbidity and mortality. Our study confirms the seriousness of persistent pre-eclampsia which carries a high risk of maternal complications.

Is the presence of an initial hypo albuminemia at admission for acute coronary syndrome a bad prognostic?

Monia El Mourid, Zakaria Qechchar, Fatima Ez-zahraa Talhi, Amine Boutaleb, Salim Arous, Ghali Bennouna and Rachida Habbal
Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: Several studies have shown that a decrease in serum albumin level is associated with an increased risk of occurrence of a cardiovascular event and heart failure. In acute coronary syndrome, a decrease in serum albumin is generally associated with severe coronary lesions, increased long-term mortality and the occurrence of heart failure. The aim of our study is to ascertain whether the presence of such hypo albuminemia during admission to hospital for acute coronary syndrome is, or is not, a risk factor for the development of cardiac insufficiency de novo during hospitalisation, as well as its precise impact on hospital mortality.
Methods: This is a retrospective study of 132 patients hospitalised for acute coronary syndrome in the cardiology department of CHU Ibn Rochd Casablanca between April 2016 and September 2017. Patients with heart failure were excluded. Patients were divided into quartiles (Q) according to their initial serum albumin level: Q1: <35.0g/l; Q2: 35.1 - 38.0g/l; Q3: 38.1 - 40.8g/l; Q4: >40.8g/l.
Results: The mean age was 58 ± 11.2 years, with a clear male predominance (64.3%), the rate of hypertension was 39%, diabetes was 42.9% and smoking was 47%. The rate of onset of de novo heart failure (36%, 21.9%, 13.2% and 12.9% for Q1, Q2, Q3 and Q4, respectively, p<0.0001) and hospital mortality (7.8%, 3.5%, 1.90%, and 1.2% for Q1, Q2, Q3 and Q4, respectively, p<0.0001) were significantly higher when albumin levels were lower.
Conclusion: In patients with ACS, an initial serum albumin level <35.0g/l is a predictive criterion for de novo heart failure and hospital mortality. In this clinical situation, hypoalbuminemia would reflect the presence of an underlying inflammatory state.

Correlation between global longitudinal strain and diastolic left ventricular function in hypertensive patients

Monia El Mourid, Zakaria Qechchar, Fatima Ez-zahraa Talhi, El Mehdi Aqli, Imad Nouamou, Leila Azzouzi and Rachida Habbal
Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: Heart failure with preserved LVEF is an important cause of mortality and morbidity in hypertensive patients. A close correlation between impaired diastolic function and longitudinal systolic dysfunction could have several explanations. The diastole is a dependent energy process, especially during its first phase. It also includes active systolic components during the iso volumetric relaxation phase, in addition, the achievement of intrinsic myocyte function is part of hypertensive pathology, as evidenced by recent studies.
Methods: This work consisted of performing a full echocardiography study in a series of 111 hypertensive patients (25 - 75 years of age), including biplane Simpson LVEF, left indexed ventricular mass the diastolic function and finally the study of LV longitudinal deformation by speckle tracking technique (GLS). Patients with secondary hypertension, leaking or stenosing valvulopathy, arrhythmia and history of coronary insufficiency were excluded from this study.
Results: Of the 111 hypertensive patients, 75 (67.5%) had diastolic function impairment, of which 20 patients (18%) had high filling pressures. A total of 49.39% had echocardiographic hypertrophy of the left ventricular, almost all of these (20 patients) had a low GLS. There is a statistically significant relationship between the decrease in GLS and the elevation of left ventricular filling pressures in hypertensive patients. These results suggest that the increase in filling pressures can be closely associated with the atrioventricular interaction in patients with hypertension, a perfect correlation with the achievement of longitudinal systolic function and diastolic function.
Conclusion: A linear relationship is noted between left ventricular mass increase, diastolic dysfunction and LV systolic dysfunction.

Peak aortic jet velocity and its correlation with the severity of aortic stenosis: A Moroccan experience

Monia El Mourid, Fatima Ez-zahraa Talhi, Zakaria Qechchar, Isis Azannai, Leila Azzouzi and Rachida Habbal

Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: The definition of very severe aortic stenosis (AS), based on peak aortic jet velocity (Vmax), remains unclear with a 5-m/s cut-off in the US and 5.5m/s noted in European guidelines. There are limited data regarding risk stratification based on Vmax in patients with severe AS. The aim of this study was to compare the clinical features and echocardiographic parameters in patients with Vmax >5m/s and <5m/s.

Methods: We achieved a prospective, single-centre study from October 2017 - January 2019, of patients followed for valvulopathies in the cardiology department of the Ibn Rochd University Hospital, Casablanca, Morocco. We included all patients with severe AS defined by a Vmax >4m/s, Gmoy >40mmHg and AS <0.6cm/m². Our patients were divided into 3 groups : G1: Vmax 4 - 4.4m/s, G2: Vmax 4.5 - 4.9m/s and G3: >5m/s.

Results: A total of 73 patients had AS and 34 of them (46%) had severe AS. The mean age was 62.24 (± 12.08) and sex ratio 0.9. The number of patients was 17 in G1, 10 in G2 and 6 in G3. Sixty-six percent in G3 had dyspnea >II NYHA vs. 88% in G1 and 2.16 vs. 5% had angina, no one had syncopa in G3 vs. 1 in G1 and 2. No patient in G3 had left or right ventricular heart failure. Electrically, 77% in G1, 80% in G2, and 66% in G3 of patients were in sinus rhythm. Fifty percent vs. 33% in G3 had repolarisation disorders. Left ventricular hypertrophy was found in 70% in G1 and 2 vs. 50% in G3. A left ventricular dysfunction (LV) was discovered in 30% of the 3 groups by the Simpson Biplan method and right ventricular dysfunction in 10% in G1 and 2 vs. 16% in G3 (p>0.001).

Conclusion: In our study Vmax >5m/s was not correlated to worse presentation, though another study is being done to assess the prognosis of this Vmax on long term morbidity and mortality.

Prevalence and related factors of metabolic syndrome in hypertensive patients in a Moroccan population

Monia El Mourid, Zakaria Qechchar, Fatima Ez-zahraa Talhi, El Mehdi Aqli, Imad Nouamou, Leila Azzouzi and Rachida Habbal

Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: Metabolic syndrome (MS) is an emerging entity which refers to the grouping together of, in the same person, several metabolic abnormalities which each predisposed to cardiovascular risk. In hypertensive patients cardiovascular diseases are the main cause of mortality and the prevalence of MS is poorly known. The objective was to determine the prevalence of MS, and its associated factors, in a sample of patients with high blood pressure in a Moroccan population.

Methods: Cross-sectional study involving 221 patients with arterial hypertension (>20 years). The following measures were performed: blood pressure; body mass index (BMI); plasma glucose and lipid levels. Blood pressure criterion: mean systolic blood pressure >140mmHg and/or diastolic blood pressure >90mmHg. The diagnosis of metabolic syndrome is retained according to WHO criteria and NCEP-ATP III criteria.

Results: A total of 221 hypertensive patients were analysed, 80.53% were women, the mean age was 60 ± 10 years. The prevalence of MS was 69.11%, mainly amongst the women. Central obesity was the most common component of MS, accounting for 72.39% of patients (12.3% of men and 87.7% of women). Amongst other factors, low HDL-C was present in 66.51% (20.67% of men and 79.33% of women), hyperglycemia in 70.13% (16.28% of men and 83.72% of women) and high triglycerides in 67.42% (20.81% of men and 79.19% of women).

Conclusion: The prevalence of metabolic syndrome is high in patients with high blood pressure. This highlights the importance of routine screening of hypertensive patients for other risk factors for cardiovascular disease.

Prevalence of confusion in cardiogenic shock

Monia El Mourid, Fatima Ez-zahraa Talhi, Zakaria Qechchar, Salim Arous, Imad Nouamou, Ghali Bennouna and Rachida Habbal

Cardiology Department, Ibn Rochd University Hospital, Casablanca, Morocco

Introduction: Cardiogenic shock is defined as a failure of the heart pump to supply the needs of the body. It is an important cause of cardiovascular mortality, especially when it is of coronary origin. The clinical symptoms are haemodynamic, respiratory but also neurological.

The objective of our study is to study the prevalence of confusion among patients admitted with cardiogenic shock.

Methods: We carried out a prospective, mono-centric study over a period of 18 months, from 1 January 2017 - 1 June 2018, involving 22 patients admitted for cardiogenic shock in cardiac intensive care unit in the cardiology department of Ibn Rochd Hospital, Casablanca.

Results: The average age of our patients was 65.14 years, with a sex ratio of 1.7, the origin of the cardiogenic shock was a coronary syndrome in 72%, mainly STEMI. The delay compared to the beginning of the pain was between 6 and 12 hours in 11.5% only. At admission, mean PAS was 77mmHg and

mean PAD 55mmHg, mean Fc was 102bpm, 59% were in PAO and 9.1% had poorly tolerated arrhythmia. Neurological signs, dominated by confusion, were present in 40.9%. The patients were revascularised in 27% of cases but the prognosis was poor with a death rate of 86.4%.

Conclusion: Cardiogenic shock remains a major public health problem in Morocco and a major cause of cardiovascular death. It is of the utmost importance to implement cardiogenic shock prevention and palliation measures and to raise awareness as to an early consultation period.

Emergency-NGO Salam Centre for Cardiac Surgery (SCCS), Sudan: Quality assessment of Warfarin treatment in patients with mechanical heart valves

Nicoletta Erba*, Giulia Pedroni#, Sohayda Hussein Abdallah Abdallah#, Lorenzo Valgoi†, Alessandro Mocini†, Franco Masini†, Martin Langer†, Gina Portella†, Alessandro Salvati#, Giorgio Brogiato# and Gino Strada#

*Salam Centre for Cardiac Surgery, Emergency-NGO, Khartoum, Sudan. Italian Federation of Anticoagulation Clinics (FCSA). #Salam Centre for Cardiac Surgery, Emergency-NGO, Khartoum Sudan.

Introduction: The SCCS has been active in Khartoum since 2007 and, up to 31 January 2019, 5 184 patients had been submitted for mechanical valve replacement (MVR) and started on vitamin K antagonist (VKA) therapy. Our aim is to evaluate the quality of VKA treatment by Time in Therapeutic Range (TTR),[1] a tool to assess VKA therapy.

Methods: In a prospective observational study which lasted 6 months (1 August 2018 - 31 January 2019), 45 419 samples from 3 639 patients were analysed. TTR was calculated through the use of PARMA GTS® (WERFEN), a software for VKA management. In accordance with the different target values of International Normalised Ratio (INR), patients were divided into 2 groups: Group A = target 2.5 (aortic valve without thrombotic risk); Group B = target 3.0 (mitral, multiple valves, aortic valve with thrombotic risk). Individual TTR is rated as good if the value is in range >70% of the time.

Results: TTR was available for 3 111 patients, 444 (14%) belonging to Group A and 2 667 (86%) to Group B. Global median TTR was 53% (IQR: 35 - 70), 67.5% (IQR: 51 - 83) in Group A and 51% (IQR: 34 - 67) in Group B. A good quality (TTR >70%) was achieved in 45.8% and 20.8% of patients in Group A and B respectively (p≤0.0001).

Conclusion: The quality of anticoagulation in patients with MVR is not well known in western or developing countries. The Italian PLECTRUM multicentre study[2] involved 2 357 patients. Median TTR was 60%. A Malaysian study[3] showed a mean TTR of 57.1% in 107 patients. Our global results are slightly worse. TTR is better in low INR target patient group. This is also true in cited studies. Improved education and organisation efforts are needed to further improve quality of treatment.

[1] Rosendaal Thromb Haemost 1993;69:236 [2] Poli, et al. Int Jour of Card 2018;267: 68-71. [3] Tan CSY, et al. Glob Hear 2018;13:241

Emergency-NGO Salam Centre for Cardiac Surgery (SCCS), Sudan: Gender and age related adherence to Vitamin K Antagonists (VKA) treatment after mechanical heart valve replacement

Nicoletta Erba*, Giulia Pedroni#, Shadia Mohamed Osman Taha#, Lorenzo Valgoi#, Alessandro Mocini#, Franco Masini#, Martin Langer#, Gina Portella#, Alessandro Salvati# and Gino Strada#

*Salam Centre for Cardiac Surgery, Emergency-NGO, Khartoum, Sudan. Italian Federation of Anticoagulation Clinics (FCSA). #Salam Centre for Cardiac Surgery, Emergency-NGO, Khartoum Sudan.

Introduction: Time in Therapeutic Range (TTR) is a tool used to evaluate the quality of VKA treatment. A good TTR depends on the prescriber's expertise and the patient's compliance. In African countries, many cultural and socio-economic reasons can influence the achievement of a good TTR. Weight varies with gender and age. Our aim is to investigate the role of these factors in regard to TTR.

Methods: In a prospective observational study, from 1 August 2018 - 31 January 2019, 45 419 samples from 3 639 patients were analysed. TTR was then calculated[1] through the use of PARMA GTS® (WERFEN) software for VKA management. Patients were grouped according to gender and age (3 groups: A: ≤20 years, B: 21 - 40 years and C: >41 years).

Results: TTR was calculated for 3 111 patients: 45.2% were female; the median TTR was 50% (IQR 33 - 67) for female patients and 56% (IQR 38 - 73) for males (NS). The median TTR in the 3 age groups was 44% (IQR 27 - 60), 53% (IQR 35 - 70) and 59% (IQR 42 - 73) (p≤0.0001). A worse TTR in females was seen in every age group: in Group A: 34% for females, 37% for males; Group B: 40% for females, 46% for males; Group C: 47% for females and 51% for males.

Conclusion: The worse treatment quality is observed in younger patients, both in Western and low-income countries. Treatment strategies for young patients with chronic diseases is a subject of debate. Also, teenagers with mechanical valves require specific approaches. Economic factors and education levels could be part of the reason why the worse quality treatment is found with females. Our data show the importance of a gender and age specific approach to the management of patients taking oral anticoagulants.

[1] Rosendaal Thromb Haemost 1993;69:236

Emergency-NGO Salam Centre for Cardiac Surgery (SCCS), Sudan: Role of remoteness in adherence to Vitamin K Antagonists (VKA) treatment after heart valve replacement

Nicoletta Erba*, Giulia Pedroni#, Lina Mohamed Osman#, Lorenzo Valgoi#, Alessandro Mocini#, Franco Masini#, Martin Langer#

*Salam Centre for Cardiac Surgery, Emergency-NGO, Khartoum, Sudan. Italian Federation of Anticoagulation Clinics (FCSA). #Salam Centre for Cardiac Surgery, Emergency-NGO, Khartoum Sudan.

Introduction: The SCCS has been active in Khartoum since 2007 and, up to 31 January 2019, 5 184 patients had received mechanical valve implants and were started on VKA therapy. VKA treatment is periodically monitored by Prothrombin Time-International Normalised Ratio (INR) in the SCCS-Oral Anticoagulant Clinic (OAC) or, where necessary, in external laboratories. In this case INR data are sent to the OAC and the VKA prescription is returned to the patient via phone call, WhatsApp or email. Quality is checked by Time in Therapeutic Range (TTR).[1] Our aim is to compare the TTR of patients living around Khartoum with those living in Darfur, a region of Sudan far from the SCCS.

Methods: In this prospective observational cohort study of 6 months (1 August 2018 - 31 January 2019) we analysed and compared data from patients with different access points to care. Global and individual TTR are extracted from PARMA GTS® (WERFEN), a software dedicated to VKA management. Data are reported as median and accordingly rated as GOOD (>70% in range), INTERMEDIATE (50% - 70%) and POOR (<50% in range).

Results: TTR was available for 873 patients living in the Khartoum State (K) and for 519 in Darfour (D). The median TTR was 56 (IQR: 38 - 72) (K) and 47 (IQR: 31 - 65.5)(D) (NS). The quality of treatment was rated as GOOD in 28.3% (K) vs. 21.2% (D), as INTERMEDIATE in 33.6% (K) vs. 24.8% (D) and as POOR in 38.1% (K) vs. 54% (D). Results were significantly worse in Darfur ($p<0.001$).

Conclusion: Many factors, including: distance, transport, laboratory availability, phone and internet connections, and drug availability, can interfere with VKA treatment. The Darfour area is poor and situated far from Salam OAC where patients receive complete monitoring free of charge, counselling and drug supply. Improvement of VKA treatment in remote and rural regions is a priority for EMERGENCY-NGO.

[1] Rosendaal Thromb Haemost 1993;69:236

A rare case of bilateral pheochromocytoma, paragangliomas and hypertrophic cardiomyopathy

Ellise Gambahaya and Ruchika Meel

Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Pheochromocytoma/paragangliomas are relatively rare catecholamine secreting tumours which are associated with a range of cardiovascular effects. Notably, pheochromocytoma has been reported to cause cardiomyopathies which include tachycardia induced cardiomyopathy, stress cardiomyopathy and hypertrophic cardiomyopathy.

Methods: We report the case of a 20-year-old male patient who presented with bilateral pheochromocytoma, paragangliomas and hypertrophic cardiomyopathy.

Results: A 20-year-old man presented with a 3-day history of abdominal pain and vomiting following a forceful blow to the abdomen. On examination his blood pressure was 145/80mmHg with a tachycardia of 110bpm. Abdominal examination was significant for a tender left upper quadrant mass. Examination of the cardiovascular system revealed a laterally displaced forceful apical impulse with an ejection systolic murmur heard loudest at the left sternal edge. He admitted to episodes of palpitations and sweating, however, he denied suffering from headaches or tremors. He also denied any episodes of elevated blood pressure. Electrocardiogram showed left ventricular hypertrophy with a strain pattern. An echocardiogram was significant for severe concentric left ventricular hypertrophy (interventricular septal thickness of 20mm and posterior wall thickness of 18mm) with preserved systolic and diastolic function. However, myocardial global longitudinal strain was reduced at -12%. Systolic anterior motion of the anterior mitral valve leaflet was not demonstrated. Left ventricular outflow tract peak pressure gradient was 17mmHg at rest. A computed tomography scan of the abdomen revealed bilateral adrenal and para-aortic masses and computed tomography of the chest showed multiple lung nodules. Urine normetanephrines were elevated (39 251nmol/24hours) as well as urine vanillymandelic acid (79.6umol/24hours). The patient was commenced on atenolol and doxazosin in preparation for surgical excision.

Conclusion: We have reported a case of hypertrophic cardiomyopathy with radiological and biochemical evidence of pheochromocytoma and parangagliomas.

Evaluation of myocardial reperfusion by intravenous thrombolysis in acute coronary syndromes with persistent ST-elevation

Ngoné Diaba Gaye[†], Aliou Alassane Ngaide[*], Malikit Abdoulaye Moctar[#], Ngoné Diaba Gaye[†], Maimouna Sow[‡], Momar Dioum[◊], Fatou Aw[‡], Sérigne Mor Beye[§], Salimatou Dela Diallo[#], Simon Antoine Sarr[‡], Mouhamed Haris[#] and Alassane Mbaye[#]

[*]University Cheikh Anta DIOP of Dakar/General Hospital of Grand Yoff, Dakar, Senegal. [#]General Hospital of Grand Yoff, Dakar, Senegal. [†]Institute of Medico-Social Foresight Hospital, Dakar, Senegal. [‡]Hospital Aristide Le Dantec, Dakar, Senegal. [◊]FANN National Hospital, Dakar, Senegal. [§]Saint Louis General Hospital, Dakar, Senegal

Introduction: The rapid and effective management of acute coronary syndrome with the ST segment has become a subject of constant challenge with the importance of speedy management being stressed. The objective of this work was to evaluate myocardial reperfusion by thrombolysis in a cardiology service in Dakar, Senegal.

Method: This prospective study was conducted from January - December 2016 in the cardiology department of Grand Yoff General Hospital. We have included thrombolysed STM + IDMs. The success of fibrinolysis was defined according to clinical criteria (disappearance of chest pain) and electrocardiography (decrease of AST at least 50%). Data analysis was done using SPSS software version 17.0. A value of $p<0.05$ was considered significant.

Results: Of the 145 IDMs seen during the study period, 61 (8.13%) were thrombolysed. Mean age was 59 years and the sex ratio was 2.21. The average chest pain - thrombolysis time was 5.74 hours. The success rate of fibrinolysis was 59.02%. In multivariate analysis, the independent predictor of successful fibrinolysis was delayed thoracic pain - emergency arrival less than or equal to 180 minutes. In contrast, diabetes ($p=0.05$), hypertension ($p=0.025$) and female sex ($p=0.035$) were factors associated with increased time to fibrinolysis. The most common complication was intracerebral haemorrhage (3.30%). Hospital mortality was 6.6% in relation to cardiovascular collapse and ventricular fibrillation.

Conclusion: Our study shows that reperfusion delays were long. Fibrinolysis was successful given the short time period.

Evaluation of the therapeutic observance of outpatients with hypertension at the Cardiology Department of Grand Yoff General Hospital in Dakar, Senegal

Ngone Diaba Gaye[*], Aliou Alassane Ngaide[#], Maimouna Sow[†], Momar Dioum[◊], Fatou Aw[†], Serigne Mor Beye[§], Salimatou Dela Diallo[#], Cheikh Gaye[#], Joseph Salvador Mingou[†], Simon Antoine Sarr[†] and Alassane Mbaye[#]

[*]Medico-Social Foresight Institute, Cheikh Anta Diop University, Dakar, Senegal. [#]General Hospital of Grand Yoff, Dakar, Senegal. [†]Aristide Le Dantec Hospital, Dakar, Senegal. [◊]FANN National Hospital, Dakar, Senegal. [§]Saint Louis General Hospital, Dakar, Senegal

Introduction: Hypertension is a global public health problem and one of the leading causes of early death worldwide. Non-adherence remains a real problem in the management of high blood pressure. The aim of this study was to evaluate the determinants of therapeutic observance in hypertensive patients at Grand Yoff General Hospital.

Methods: This was a cross-sectional study, from 7 August 2017 - 6 October 2017, of outpatients at the Grand Yoff General Hospital cardiology department. Therapeutic compliance was assessed using the Girerd compliance assessment test which consisted of 6 questions which patients had to answer with yes or no. Data collection was done using the Sphins V.5 software. A value of p less than 0.05 was considered significant.

Results: Ninety-nine patients were enrolled. The mean age was 61.4 ± 11.6 years with extremes of 25.0 and 82.0 years. The sex ratio H/F was 0.5. Prevalence of tobacco and alcohol consumption was respectively 4% and 5%. Average body mass was 26.6 ± 5.9kg/m² and 73.7% of patients had a sustainable physical activity. Mean systolic blood pressure was 150 ± 20mmHg. Mean diastolic blood pressure was 88 ± 12mmHg. A total of 74.7% of patients followed a salt restricted diet. Blood pressure was controlled in 35.4% of patients. Other cardiovascular risk factors were: dyslipidemia (49.5%), obesity (26%) and diabetes (21%). A total of 54.6% patients had compliance issues and 9.1% were poor observers.

Conclusion: Improving adherence to treatment in our context requires better education of patients and the implementation of a specific national programme for the control of blood pressure.

Pattern of coronary artery disease in Black African women: About 92 cases

Ngone Diaba Gaye*, Fatou Aw#, Simon Antoine Sarr#, Aliou Alassane Ngaide†, Momar Dioum‡, Mouhamadou Bamba Ndiaye#, Maboury Diao#, Serigne Cheikh Ndao◊ and Serigne Abdou Ba#

*Medico-Social Foresight Institute, Cheikh Anta Diop University, Dakar, Senegal. #Aristide Le Dantec Hospital, Dakar, Senegal. †General Hospital of Grand Yoff, Dakar, Senegal. ‡FANN National Hospital, Dakar, Senegal. ◊Principal Military Hospital, Dakar, Senegal

Introduction: To study the prevalence and pattern of CAD among women undergoing CAG in Dakar.
Methods: Data of 92 women who underwent CAG for suspected CAD over 3 years were retrospectively analysed. They were classified into a young group (age <55 years) and elderly group (age ≥55 years).
Results: Overall, prevalence of obstructive coronary artery disease was 53.3%. Multivessel disease was found in 35.9% of cases. There was a greater prevalence of obstructive CAD (35 vs. 14; p=0.51), especially double vessel and triple vessel disease in the elderly group while normal coronaries were more prevalent in the young group. The prevalence of LMD was 4.4% and exclusively found in elderly women. The pattern of involvement of coronary arteries was the same for both groups; left anterior descending artery was the most commonly affected vessel.
Conclusion: This study demonstrates that CAD is present in groups, such as young women, not previously considered at risk.

CAMISSA: The contemporary study of acute myocarditis in sub-Saharan Africa

Karim Hassan*, Philip Herbst*, Anton Doubell*, Dan Zaharie*, Gert Van Zyl# and Charles Kyriakakis*

*Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #National Health Laboratory Services, Johannesburg, Gauteng, South Africa.

Introduction: The aetiology and estimated incidence of acute myocarditis (AM) remains undefined in Africa. Whilst cardiac magnetic resonance (CMR) provides a provisional non-invasive diagnosis, endomyocardial biopsy (EMB) remains the gold standard. The developed world has experienced a shift in the viral epidemiology of AM and the European Society of Cardiology's most recent position statement on myocarditis recommends both CMR and EMB as the standard of care in suspected cases. We report on the interim results of the study.
Methods: A cohort of patients from a single tertiary centre in South Africa will be recruited from January 2018 - December 2022. All patients presenting or referred to the centre with clinically suspected AM will be investigated according to ESC recommendations on myocarditis. This includes blood tests (inflammatory markers, cardiac enzymes, HIV and hepatitis C serology and ANA in females), a standard 12-lead electrocardiogram, transthoracic echocardiography, coronary angiography, CMR and EMB. Enrolment is ongoing.
Results: A total of 48 (mean age 41.3 ± 13.3 years, 65.3% male) clinically suspected cases of AM were identified between January 2018 and June 2019. Twenty-six patients presented with symptoms of ACS, 16 with heart failure, 4 with ventricular tachycardia and 2 with heart block. At index presentation, 33 had an elevated hs–Trop T. CRP was elevated in 20 of these patients and in isolation in another 6. Thirty-three patients met the Lake Louise criteria on CMR, of which 5 fulfilled the Dallas criteria and 15 the immunohistochemical criteria on EMB. Eight CMR negative cases were found to have AM on EMB. Twenty-nine were PCR positive for cardiotropic viruses.
Conclusion: This study demonstrates the heterogeneity in presentations and provides insight into the possible viral pathogens within our local setting. This appears to be similar to those reported in the developed world. To our knowledge, this is the first study to evaluate AM in Africa.

Transcatheter interventions in the management of coarctation of the aorta: An 18-year single centre South African experience

Shenaaz Ghulam Hoosain and Antoinette Cilliers

Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Transcatheter interventions are an alternative to surgery in the management of native and recurrent non neonatal coarctation of the aorta (CoA). This study reports on an 18-year experience of transcatheter interventions in the management of CoA at the Chris Hani Baragwanath Academic Hospital in the Department of Paediatrics.
Method: Retrospective record review.
Results: From 2001 to 2019, 28 patients (mean age 14 years, range 10 weeks - 36 years) with native (13/28, 46%) or postoperative (15/28, 54%) CoA were treated via a transcatheter approach. Intravascular stent implantation (ISI) was done in 20 patients (n=28, 71%) and Balloon angioplasty (BA) in 8 patients (n=28, 29%). The choice between BA vs. ISI depended on the patient's age and weight. Ten (n=15, 67%) patients with postoperative CoA had

ISI and 5 (n=15, 33%) had BA. Native CoA was treated with ISI in 10 patients (n=13, 77%) and with BA in 3 (n=13, 23%) patients. Covered stents (14/20, 70%) were used more often for complex and tighter CoA than bare stents (6/20, 30%). Success rate in the whole group was 96%. The average reduction in the peak to peak gradient was 88% (ISI) and 68% (BA). Acute complications occurred in 18% (5/28). This included haemodynamic instability, stent migration, Takatsubo cardiomyopathy, peripheral vascular and neurological complications. Hypertensive arteriopathy remained as a chronic complication. Re-intervention using a transcatheter approach was required in 5 patients (n=28, 18%).

Conclusion: Transcatheter approaches in the management of CoA are relatively safe and effective in a resource limited centre. The spectrum of patients treated at our institution has increased with lower rates of acute and chronic complications and this can most likely be attributed to the use of covered ISI, increased case experience and the adoption of appropriate techniques.

Bicuspid aortic valve disease: A rare finding in South African children of black African descent

Luke Hunter*, Mark Monaghan#, Guy Lloyd†, Alfonso Pecoraro*, Anton Doubell* and Philip Herbst*

*Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #Kings College Hospital, London, United Kingdom. †Barts Heart Centre, St Bartholomew's Hospital, London, United Kingdom

Introduction: Congenital bicuspid aortic valve (BAV) is considered the most common congenital heart defect. A notable finding from previous studies suggests that populations of African American descent are less affected by this condition and have a milder phenotype of BAV dysfunction. To date, there are no epidemiologic studies documenting BAV incidence in South Africa.

Methods: Cases of BAV were retrospectively identified from the Echo in Africa database (an ongoing large-scale RHD echocardiographic screening project in the Western Cape). BAV is defined as a congenital fusion (complete or partial) of 2 aortic valve cusps. BAV is classified according to the leaflet morphology (type 1, 2, 3) ± aortopathy. The reported incidence of BAV was classified according to racial demographic (White, Black African and Mixed race - a South African ethnic group of Khoisan-European-African-Malay mixed ancestry).

Results: A total of 6 171 studies from secondary schoolchildren (aged 13 - 18) was evaluated. Of these, 2 334 participants (37.8%) were black African, 2 984 (48.3%) were mixed race and 853 (13.8%) were white. Sixteen cases (0.26%, 95%, CI 0.16 - 0.42) of BAV were identified in our cohort with a male predominance (68%). Eleven cases were identified amongst white children (1.29%, 95%, CI 0.72 -2.29), 4 cases amongst mixed race children (0.13%, 95%, CI 0.05 - 0.34) and 1 case amongst black African children (0.04%, 95%, CI 0.01 - 0.24). Type 1 leaflet morphology was observed in 9 cases, types 2 and 3 in 1 case respectively and 4 cases of partial fusion of the left- and non-coronary cusps were observed. Five cases of aortopathy were identified.

Conclusion: Our data provide the first description of BAV incidence in South Africa and supports the notion of a possible protective trait amongst our black African population. Further research is required to determine what genetic and/or environmental factors may be responsible for this noteworthy finding.

The Echo in Africa project: A 5-year experience of cardiac screening in South African school children

Luke Hunter*, Mark Monaghan#, Guy Lloyd†, Alfonso Pecoraro*, Anton Doubell* and Philip Herbst*

*Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #Kings College Hospital, London, United Kingdom. †Barts Heart Centre, St Bartholomew's Hospital, London, United Kingdom

Introduction: In 2014, SUNHEART, a non-profit organisation established by the Division of Cardiology at Tygerberg Academic Hospital (TBH) and the British Society of Echocardiography (BSE), launched the Echo in Africa project. The primary aim of the study was to determine the echocardiographic prevalence of RHD amongst schoolchildren living in underserved communities in the Western Cape, South Africa.

Methods: Selected secondary schools in the greater Cape Town and Winelands districts were invited to take part in the study. All enrolled participants (aged 12 - 19) underwent a screening study with a hand-held (HH) device [General Electric (GE™) V-scan]. Children with an abnormal HH study (defined as MR jet >1.5cm or AR jet >0.5cm or any other morphological features of RHD, congenital or acquired heart disease) were comprehensively re-evaluated with a GE™ Vivid I portable laptop machine enabling classification according to the current World Heart Federation (WHF) criteria for RHD diagnosis.

Results: Over a 5-year period, a total of 5 138 participants (mean age 15.5 years) were screened, 3 324 (64.6%) were female. Comprehensive echocardiography identified 44 cases of WHF "definite" RHD (8.3 cases /1 000; 95% CI, 6.2 - 11.1 cases/1 000) and 89 cases of WHF "borderline" RHD (16.9 cases/1 000; 95% CI, 13.6 - 20.5 cases/1 000).

Conclusion: We present data from the largest echocardiographic RHD screening cohort assembled in South Africa, reflecting one of the highest reported RHD prevalence rates in the world. Further study is necessary to determine whether routine echocardiographic screening should be incorporated into a national health initiative to combat RHD.

Anterior mitral valve leaflet restriction: A common variant amongst South African children

Luke Hunter*, Mark Monaghan#, Guy Lloyd†, Alfonso Pecoraro*, Anton Doubell* and Philip Herbst*

*Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #Kings College Hospital, London, United Kingdom. †Barts Heart Centre, St Bartholomew's Hospital, London, United Kingdom

Introduction: The World Heart Federation (WHF) criteria for echocardiographic diagnosis of RHD rely on the use of colloquial terms such as dog-leg to define AMVL restriction rather than a strict, reproducible definition. We recognise AMVL restriction when the tip of the leaflet is seen to point away from the interventricular septum and towards the posterior left ventricular (LV) wall at peak diastole in the parasternal long axis (PSLAX) view. This definition risks inclusion of a finding commonly identified in our high-risk screening programme (Echo in Africa - EIA) which demonstrates gradual AMVL bowing (so-called slow-bow) from the proximal to mid-leaflet but with free motion (fluttering) of the tip during diastole. We propose that this is a normal variant of the AMVL and is unrelated to the RHD process, provided no concomitant morphological features of RHD are identified.

Methods: Retrospective analysis of EIA data obtained from children (aged 13 - 18) attending 2 separate South African schools with a documented high- and low-RHD prevalence. Cases of AMVL restriction were identified and classified according to the definitions provided above.

Results: A total of 941 screening studies (HR cohort n=577/LR cohort n=364) were evaluated. Seventy-four cases of AMVL restriction (12.82%, 95%, CI 10.34 - 15.80) were identified in the HR cohort of which 8 cases demonstrated AMVL-tip restriction (1.39%, 95%, CI 0.70 - 2.71) and 65 cases demonstrated slow bow (11.27%, 95%, CI 8.94 - 14.11). There were no cases of AMVL-tip restriction observed in the LR-cohort and 35 cases of slow-bow (9.62%, 95%, CI 7 - 13.08).

Conclusion: Our results support the hypothesis that slow-bow AMVL restriction is a common variant of the AMVL amongst South African school children and unrelated to the RHD process. Further research is required to investigate the exact mechanism underlying this form of AMVL restriction.

Epidemiology of heart failure in sub-Saharan Africa: Republic of the Niger

Ali Touré Ibrahim, B. Dodo, H. Saley, M. Arzika, K. Souley, A.Z. Zakarya, H.K. Soumana, M. Aichatou, D.K. Sambou, I. Coulidiati, I. Arzika, Ô. Yahaya and O. Moustapha

Lamorde Teaching Hospital, Niamey, Niger

Introduction: Heart Failure (HF) is a common cardiac disease which occurs in 2% - 3% of the world's adult population. This translates to 23 million people globally, 10% - 20% of these individuals being 70-years-old and older. In Africa, hospital-based studies reveal the following incidences of HF in patients <45 years: RCI 40%, Sénégal 37.7% and Togo 28.6%. A high mortality rate of 45% - 60% in 5 years is recorded in this cohort of patients.

Methods: This is a 9-year retrospective/prospective study done at the cardiology department of the Lamorde Teaching Hospital from January 2010 - September 2018. Inclusion criteria stated that all patients admitted for HF, consequently diagnosed on clinical and echocardiographical findings, could be admitted to the study.

Result: From 1 January 2010 - 30 September 2018 (105 months): 1 447 patients were diagnosed with HF from a possible 3 021 cardiac patients. The prevalence of HF was 47.88% in 105 months, equivalent to 13 - 14 cases per month and approximately 1 case every 2 days. The principal aetiologies were: DCI (26.74%), ischaemic HD (4.63%), dysthyroiditis (0.34%), PPCM (12.85%), HBP (45.75%), pericarditis (0.48%) and valvulopathy (9.19%). Management of these HF cases are discussed within our context.

Conclusion: In most African countries heart failure is due to hypertension cardiomyopathies and valvular diseases, most often associated with anaemia and infection. The prevention of these cases should be prioritised to avoid late stage HF with significant mortality and morbidity.

Knowledge gaps amongst rheumatic heart disease post-surgical patients and the impact of education

Olukemi Ige, Christopher Yilgwan, A.T. Larab and Fidelia Bode-Thomas

Heart Aid Trust plc., Jos, Nigeria

Introduction: Rheumatic heart disease (RHD) is totally preventable by the appropriate management of streptococcal sore throat and rheumatic fever (RF). In Africa, however, many patients present with advanced disease. We sought to identify RHD knowledge gaps among post-surgical RHD patients and evaluate the impact of education provided about the disease.

Methods: As part of the "Kick rheumatic heart disease out of Plateau State" project, a focus group discussion (FGD) was conducted amongst post-surgical RHD patients. Baseline knowledge of sore throat, RF and RHD was assessed. After a lecture on RHD, their knowledge was reassessed. Content analysis using codes and themes was used.

Results: Fifteen females participated in the FGD; many attributed a sore throat to eating hot foods, taking cold drinks and said it could result in fever, one said it was a bacterial infection. After the lecture, Group A ß haemolytic streptococcus infection was the only cause mentioned, while RF and RHD were named as complications. Before the lecture, RF was attributed to an infection that may have been present at birth, to heart failure or, in one instance, to a genetic problem. One participant had never heard of RHD and many said sore throat could be treated with potash solution, salt-water gargle or over-the-counter drugs. After the lecture, RF as a complication of sore throat was the most common response. The majority said they would now go to the hospital if they had a sore throat while others said avoiding cold drinks would suffice.

Conclusion: Our cohort of post-surgical RHD patients demonstrated significant misconceptions and knowledge gaps which the information, provided in lecture form, served to improve. Education of RHD patients/relatives about the disease should be a continuous process and the ready availability of culturally relevant educational materials will help to facilitate this process.

Challenges in the management of infective endocarditis in a developing country

Oukemi Ige*, Fatima Baba#, Christopher Yilgwan* and Fidelia Bode-Thomas*

*University of Jos, Jos, Nigeria. #Jos University Teaching Hospital, Jos, Nigeria

Introduction: The diagnosis of infective endocarditis (IE) in Nigeria is still challenging as health care expenditure is mostly out-of-pocket. Also, the high rate of antibiotic use before presentation increases the rate of culture negative infections, thereby affecting outcomes. We evaluated the outcomes of children diagnosed with IE at a tertiary hospital in Jos, Nigeria.

Methods: A prospective study in which children with a diagnosis of definite or possible IE were recruited over a period of 18 months using the modified Duke's criteria. Demographic, laboratory and echocardiographic findings were documented. Data were analysed using STATA 14.0.

Results: A total of 31 children were recruited with 16 (51.6%) males; mean age of 10.9 years. Fourteen (45.2%) of the 31 children had definite IE. RHD was the most common underlying cardiac disease followed by congenital heart disease (CHD). Only 1 child had no underlying heart disease whilst another had dilated cardiomyopathy. The mean duration of illness before diagnosis was 41.7 days; range of 4 - 180 days. Previous antibiotic use was present in 18 (58.1%) children, vegetations in 12 (38.7%) while cultures were positive in 6 (19.4%) children. Eighteen children (58.1%) died. Mortality was more frequent among children who were older [11.5 years (95% CI 8.2, 14.8 years) vs. 9.2 years (95% CI 4.4, 13.9 years), p=0.4], had a lower fractional shortening [26.1% (95% CI 19.0, 33.1%) vs. 34.1% (95% CI 19.5, 43.8%), p=0.21] and a longer mean duration of illness [50.1 days (95% CI 19.0, 81.2 days) vs. 21.1 days (11.2, 47.1 days), p=0.34]. These differences were, however, not statistically significant.

Conclusion: The high rate of previous antibiotic use and low rate of culture positive cases contribute to challenges in the management of IE in Nigeria. A high index of suspicion would promote earlier diagnosis and treatment.

Reproductive health services and cardiovascular health: The RESCUE RHD project pilot phase (small grant)

Keila Jamal

Mozambique Institute for Health Education and Research (MIHER), Maputo, Mozambique

Introduction: Results from the largest rheumatic heart disease registry in sub-Saharan Africa (REMEDY), reported considerable more women in their reproductive age as men. Recognising that RHD disproportionately affects females, and that it is a significant cause of morbidity and maternal mortality, the UN has recently recommended its inclusion in maternal and child health programmes. Our project is a step towards guaranteeing better access to reproductive health services for women living with CVD (including RHD) in Mozambique.

Methods: The project was aimed at improving knowledge of common CVD (including RHD) and improving access to care for women of child-bearing age. This phase ran for a period of 6 months, 2018 – 2019, and comprised 3 main activities: (1.) starting up joint obstetric clinic integration with 2 referral hospitals, (2.) holding 3 workshops with gynaecologists in Maputo City and (3.) conducting 3 focus group discussions with CVD patients in order to identify potential peer supporters.

Results: The joint clinic currently has a 5-member team: 1 cardiologist, 2 gynaecologists, 1 general practitioner and 1 nurse. A registry of women of reproductive age with CVD was created and submitted for approval by the ethics committee; 15 patients have been registered. On average, training workshops contained 23 participants who indicated overall satisfaction with the knowledge gained. We identified 6 patients to become peer supporters (5 females). These patients have good communication skills, are willing to work with their peers and have received training. From focus group discussions, 3 major themes were identified: family planning, pregnancy and adherence to treatment.

Conclusion: Pilot activities to implement health education showed an improvement in knowledge and identified peer-supporters within the group of RHD patients. Workshops which facilitate interaction between clinicians and patients have been used to build a sense of team and prepare the peer educators in relevant themes, as raised by patients.

Fibrosis and autonomic dysfunction in Africans: The SABPA prospective study

Esmé Jansen van Vuren, Annemarie Wentzel, Leoné Malan and Nicolaas Malan

North-West University, Mahikeng, Vanderbijlpark, South Africa

Introduction: Fibrosis increases the burden on the heart through mechanisms related to ischaemic heart disease risk. Compensatory blood pressure, increased to alleviate perfusion deficits, may facilitate sympathetic hyperactivity, attenuate heart-rate-variability (HRV) and enhance fibrosis. The aim of this study was therefore to determine whether fibrosis, as indicated by the inflammation-coagulation ratio (C-reactive protein:fibrinogen) relates to time-domain HRV parameters.

Methods: The Sympathetic Activity and ambulatory Blood Pressure in Africans (SABPA) prospective cohort study was conducted on African and Caucasian teachers (n=359), aged 20 - 65 years, over a 3-year period. Ambulatory blood pressure and ECG measures were used to determine 24-hour HRV time domain measures (standard deviation of intervals/SDNN, heart rate triangular index/HRVti which provides an estimate of the overall HRV; and the root mean square of successive differences between adjacent RR intervals/RMSSD). Both SDNN and RMSSD reflect vagus nerve-mediated autonomic control of the heart. Fasting blood samples were obtained to determine C-reactive protein (CRP) and fibrinogen levels.

Results: Africans revealed a higher CRP:fibrinogen ratio ($p<0.001$) and a lower HRVti ($p<0.001$) compared to Caucasians. In Africans, HRVti was inversely associated with CRP:fibrinogen ($\beta= -0.13$, $p=0.04$). Furthermore, CRP:fibrinogen increased the likelihood for SDNN <100ms [R2 0.33, OR 5.00 (95% CI 1.01, 24.79); $p=0.05$] in Africans.

Conclusion: Fibrosis facilitated autonomic nervous system dysfunction and may increase the risk for depressed HRV and ischaemic heart disease in Africans.

Timing of pericardectomy in tuberculosis-related pericardial constriction

Thadathilankal Jess John, Alfonso Pecoraro, Anton Doubell and Phillip Herbst

Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa.

Introduction: Constrictive pericarditis (CP) is seen as the final manifestation of a wide range of pericardial pathologies. Tuberculosis remains one of the major causes of CP in the developing world with various local trials quoting development of CP in tuberculous effusions ranging from <1 to 23.8%. CP is potentially curable when treated early with pericardectomy. There are, however, no RCTs studying the timing of pericardectomy in tuberculous CP where patients are often initially identified in the so-called effusive-constrictive phase of the disease. Early surgery before onset of NYHA III or IV symptoms, and prior to myocardial atrophy ensues, is suggested. Current recommendations, based on expert opinions, suggest waiting 6 - 8 weeks after initiation of anti-TB therapy to identify patients who have developed CP who would benefit from pericardectomy.

Method: We describe the clinical evolution of an organised tuberculous effusion in a 52-year-old HIV-positive female.

Results: A 52-year-old HIV-positive female was diagnosed with an organised pericardial effusion with features supporting a clinical case definition of tuberculous effusion. Initial echocardiogram revealed effusive-constrictive physiology. On review, 3 months after initiation of anti-tuberculous therapy, echocardiographic as well as clinical findings were in keeping with constrictive pericarditis and the patient was booked for a pericardectomy. Due to defaulting follow-up, the patient was re-admitted for surgery at 6 months on completion of anti-tuberculous therapy. On clinical evaluation prior to surgery, there was complete resolution of failure symptoms with no features of constriction on repeat echocardiogram.

Conclusion: This case highlights the paucity of data regarding the optimal timing of pericardectomy in tuberculous constrictive pericarditis. It also encourages further research into the use of novel imaging modalities, including cardiac MRI and/or PET, in identifying patients with persistent pericardial inflammation who may benefit from anti-inflammatory therapy or a longer period of anti-tuberculous therapy before decisions regarding pericardectomy are made.

Antiretroviral therapy-naïve HIV-infected patients are predisposed to abdominal obesity and high-density lipoprotein/apolipoprotein A-1 impairment

Festus Kamau*, Miguel Frias#, Sandrine Lecour†, Ingrid Webster*, Sabrina Pagano#, Nicolas Vuilleumier# and Hans Strijdom*

*Division of Medical Physiology, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #Diagnostic Department, University Hospital of Geneva, Geneva, Switzerland. †Hatter Institute for Cardiovascular Research in Africa, Department of Medicine, Faculty of Health Sciences, University of Cape Town, Rondebosch, South Africa

Introduction: Metabolic and cardiovascular-related morbidities pose serious challenges in the management of HIV/AIDS-infected patients, despite the widespread use of antiretroviral therapy (ART). In sub-Saharan Africa the burden of obesity and its associated cardiovascular risk in these populations remain poorly characterised. Our aim was to investigate metabolic/cardiovascular risk and endothelial dysfunction in HIV/AIDS-infected patients from the Western Cape region.

Methods: Participants were recruited from the Western Cape province (South Africa) from an ongoing cohort study (EndoAfrica) and assigned to 3 groups (n=50/group): HIV-free [HIV(-)], HIV-infected [HIV(+)] with/without ART (tenofovir, emtricitabine and efavirenz) exposure. Subsequently, patients were subjected to health screening, anthropometric assessments, biochemical analyses and vascular endothelial structure/function [carotid-intima media thickness (CIMT) and flow-mediated dilatation (FMD)] assessments.

Results: The study population was composed of 1:2.2 male:female ratio and mean age of 37.12 ± 8.47 years. No significant differences in the 10-year Framingham general cardiovascular risk were observed among the 3 groups. However, >75% of HIV(+) ART(-) patients were obese [waist: hip ratio >0.90, in both male and female participants vs. <0.85 in HIV(-) and HIV(+) ART(+); p=0.001]. Abdominal obesity in ART-naïve HIV-infected patients was associated with significantly lower, apolipoprotein A-1, and high-density lipoprotein (HDL) levels <1.20 mmol/L compared to >1.20mmol/L in HIV(-) and HIV(+) ART(+) groups; p=0.03. In addition, circulating interferon-gamma and cell adhesion molecules, ICAM-1 and VCAM-1 levels, were elevated in HIV(+) ART(-) patients. However, the % FMD and CIMT remained unaltered among the three groups.

Conclusion: Our findings indicate that before ART exposure, HIV-infected participants were predisposed to the development of abdominal obesity with associated impairment of HDL concentration/composition. They were also prone to inflammation. These alterations were not present in ART-exposed participants. However, the 10-year general cardiovascular risk and vascular/endothelial function were altered by neither HIV infection nor by ART use and approximated that of the general population.

Outcomes of 626 echocardiographically guided pericardiocentesis: A retrospective, single centre, observational cohort study in a South African tertiary referral centre

Sumanth Karamchand*, Rory Leisegang#, Charles Kyriakakis* and Anton Doubell*

*Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #Department of Pharmacology, Uppsala University, Uppsala, Sweden.

Introduction: Echocardiographically-guided percutaneous pericardiocentesis (EGPP) is well established as a safe procedure with a low rate of minor and major complications in high-income countries. There is a paucity of data on its feasibility and safety in resource-limited settings. The primary objective of this study was to describe and evaluate EGPP outcomes and complications, in a South African tertiary referral centre, and to compare the rate of complications with the internationally accepted standard. Secondary objectives included evaluating the optimal route of access and identifying potential risk factors for procedure-related complications.

Methods: All EGPP performed between 1 January 2008 and 31 October 2018 were included. Pericardiocentesis procedural reports and clinical notes were evaluated to determine the aetiology of the pericardial effusion, pericardial access site, procedural success, volume of fluid aspirated and procedure related complications.

Results: During the 10-year study period, 626 EGPP were performed on 558 patients (mean age ±SD: 40 ± 15 years); survival was assessed in 201 patients. The leading aetiology was tuberculous-pericarditis (81.0%); iatrogenic cardiac catheterisation-related effusions comprised 1.3%. Overall, EGPP procedural success rate was 95% and 6-month survival was 98% (95% CI: 95 - 99), with a total procedure-related complication prevalence of 6.5% (95% CI: 4.5 - 8.9%); (major: 1.7%; minor: 4.8%), compared to a complication rate of 4.7% (major: 1.2%; minor: 3.5%) in the largest series from the Mayo Clinic. The preferred site of access, as per ultrasound-guidance, was the trans-apical route (55%). After adjusting for confounding variables in a multivariate analysis, multiple punctures were associated with procedure-related complications [odds ratio 7.0 (95%) confidence interval (CI): 3.30 -14.90].

Conclusion: Tuberculosis is the leading cause of pericardial disease and is associated with significant mortality. EGPP is associated with a low prevalence of complications in our centre, with major procedure related complication prevalence comparable to that of a leading centre from a high-income country. After adjusting for confounders in a multivariate analysis, multiple punctures were highly associated with an increased risk of procedure-related complications.

Thrombus aspiration in combination with glycoprotein IIb/IIIa inhibitors with, or without, stent implantation in patients presenting with STEMI and high thrombus burden

Konstantinos Kintis, Emmanouel Papadakis, Dionisis Antonatos, Christos Mantis, Charis Armonis, Konstantinos Thomopoulos, Michael Koutouzis, Ioannis Tsiafoutis, Areti Poulianitou, Kyriakos Dimitriadis and Sotiris Patsilinakos

Konstantopoulio General Hospital, INea Ionia, Greece

Introduction: High thrombus burden is an independent risk factor for death and complications, including no reflow, during primary percutaneous coronary intervention (PCI) for STEMI. The aim was to investigate whether a strategy of thrombus aspiration in combination with glycoprotein IIb/IIIa inhibitors without stent implantation is associated with a reduced incidence of slow- or no-reflow, and other thrombotic complications compared with stenting in patients with high thrombus burden.

Methods: A total of 210 patients with STEMI and high thrombus burden (thrombolysis in myocardial infarction thrombus grade ≥3) treated with thrombus aspiration in combination with glycoprotein IIb/IIIa inhibitors with or without stent implantation. Patients were divided into 2 groups: non-stent PCI group (deferred stenting, n=105) and stent PCI group (immediate stenting, n=105). A new catheterisation and deferred stent implantation was performed 48 - 72 hours after primary PCI. The end points were a myocardial blush grade of 0 or 1 (defined as absent or minimal myocardial reperfusion, respectively) and the postprocedural frequencies of a TIMI flow grade of 3, complete resolution of ST-segment elevation immediately after primary PCI, target vessel revascularisation, reinfarction, death and the combination of major adverse cardiac events by 30 days after randomisation.

Results: A myocardial blush grade of 0 or 1 occurred in 26.3% of the patients in the stent PCI group and in 17.1% of those in the non-stent PCI group ($p<0.05$). Complete resolution of ST-segment elevation occurred in 86.6% and 78.2% of patients, respectively ($p=0.35$). At 30 days, the rate of death in the stent PCI group and non-stent PCI group was 1.7% and 1.0%, respectively ($p=0.33$) and the rate of adverse events was 12.1% and 2.2%, respectively ($p<0.01$).

Conclusions: Thrombus aspiration, in combination with glycoprotein IIb/IIIa inhibitors without immediate stenting, is an applicable and effective method in a large majority of patients with myocardial infarction with ST-segment elevation and a high thrombus burden.

Factors affecting radiation exposure during transradial diagnostic coronary angiography

Konstantinos Kintis, Emmanouel Papadakis, Dionisis Antonatos, Christos Mantis, Charis Armonis, Konstantinos Thomopoulos, Michael Koutouzis, Ioannis Tsiafoutis, Areti Poulianitou, Kyriakos Dimitriadis and Sotiris Patsilinakos

Konstantopoulio General Hospital, INea Ionia, Greece

Introduction: The transradial approach during diagnostic cardiac catheterisation is being increasingly adopted as the preferred vascular access, although it is associated with increased radiation exposure when compared to the femoral access. The aim was to evaluate the factors affecting radiation exposure using the transradial approach including: radial side, catheter size and clinical determinants.

Methods: Our population consisted of 1 021 consecutive patients without a previous history of CABG (673 males, aged 66 years) which underwent diagnostic coronary angiography. Cardiac catheterisations performed via right or left radial approach using 5 or 6 French (Fr) diagnostic catheters. The primary end-points of the study were: procedural success, fluoroscopy time (FT), dose-area product (DAP), air kerma (AK) and amount of contrast agent.

Results: In the total population, FT was negatively related to height ($r=-0.100$, $p<0.001$) and positively associated with age ($r=0.111$, $p<0.001$). Dose-area product was positively associated with weight ($r=0.424$, $r<0.001$), height ($r=0.222$, $r<0.001$), BMI ($r=0.361$, $r<0.001$) and BSA ($r=0.418$, $r<0.001$). Independent-samples t-test indicated that the male sex, compared to the female sex, was characterised by increased DAP (30 221 ± 9 543 vs. 23 208 ± 5 651mGycm2, $p<0.001$), increased AK (458 ± 59 vs. 352 ± 53mGy, $p<0.001$), but decreased FT (2.88 ± 1.00 vs. 3.18 ± 0.79 minutes, $p<0.05$). The group of 6 Fr, compared to the group of 5 Fr, was characterised by increased DAP (29072 ± 9 387 vs. 25 825 ± 4 861mGycm2, $p<0.001$) and AK (441 ± 61 vs. 392 ± 49mGy, $p<0.001$). Finally, the left radial grouped when compared to the right radial group was characterised by an increased FT (3.27 ± 0.80 vs. 2.86 ± 0.73 minutes, $p<0.01$).

Conclusions: In patients undergoing transradial diagnostic coronary angiography, radial side, catheter size and clinical characteristics are factors of radiation exposure and FT in patients. These findings imply that operators seem to be less familiar with the left side approach.

Coronary artery ectasia, an independent predictor of high thrombus burden in patients presenting with ST-elevation myocardial infarction

Konstantinos Kintis, Emmanouel Papadakis, Dionisis Antonatos, Christos Mantis, Charis Armonis, Konstantinos Thomopoulos, Michael Koutouzis, Ioannis Tsiafoutis, Areti Poulianitou, Kyriakos Dimitriadis and Sotiris Patsilinakos

Konstantopoulio General Hospital, INea Ionia, Greece

Introduction: High thrombus burden is an independent risk factor for death and complications, including no reflow, during primary percutaneous coronary intervention (PCI) for ST-elevation myocardial infarction (STEMI). The aim of this study was to determine the potential association between coronary artery ectasia (CAE) and high thrombus burden during primary PCI.

Methods: A case control study was performed based on a prospective cohort of STEMI patients from January 2010 - December 2018. Thrombus burden was classified by an investigation prior to wire crossing based on the thrombolysis in myocardial infarction (TIMI) thrombus grade (higher thrombus grade, greater thrombus burden). Thrombus burden (grade ≥3 or <3) was pre-specified as the primary subgroup analysis. Control subjects were 2 consecutive STEMI patients after each case, with low thrombus burden (grade <3). CAE was defined as dilatation of an arterial segment to a diameter of at least 1.5 times that of the adjacent normal coronary artery.

Results: In the high thrombus burden group, frequency of CAE was significantly higher (23.8% vs. 3.9%, p<0.01) compared to the control group. After multivariate analysis, CAE remained a strong and independent predictor of high thrombus burden (OR 13.9, CI 4.7 - 41.2, p<0.01).

Conclusion: CAE is a strong and independent predictor of high thrombus burden during primary PCI for STEMI. Future studies should assess optimal treatment.

The use of 4 French diagnostic catheters can minimise radiation exposure through radial approach

Konstantinos Kintis, Emmanouel Papadakis, Dionisis Antonatos, Christos Mantis, Charis Armonis, Konstantinos Thomopoulos, Michael Koutouzis, Ioannis Tsiafoutis, Areti Poulianitou, Kyriakos Dimitriadis and Sotiris Patsilinakos

Konstantopoulio General Hospital, INea Ionia, Greece

Introduction: The use of small catheters for coronary angiography can reduce the risk of vascular complications, but data on radiation exposure comparing the use of 4 French (Fr) diagnostic catheters with larger sized catheters are lacking. The aim of this study was to evaluate the safety, feasibility and radiation exposure using 4 Fr diagnostic catheters through radial approach.

Methods: One hundred and twenty consecutive patients, without previous history of CABG (70 males, aged 66 years), underwent transradial coronary angiography after randomisation. Sixty procedures were performed using 4 Fr diagnostic catheters and 60 were performed using 5 Fr diagnostic catheters. The primary end-points of the study were: procedural success, fluoroscopy time (FT), dose-area product (DAP), air kerma (AK), number of catheters and amount of contrast agent.

Results: Independent-samples t-test indicated that the group of 5 Fr, compared to the group of 4 Fr was characterised by increased FT (3.36 ± 1.10 vs. 2.27 ± 0.89 minutes, p<0.001), DAP (30 205 ± 9 423 vs. 22 367 ± 5 761mGycm2, p<0.001), AK (443 ± 63 vs. 329 ± 51mGy, p<0.001) and amount of contrast agent (25 ± 3 vs. 20 ± 2ml, p<0.05). There were no significant differences in procedural success and number of catheters between the groups. Multiple regression analysis revealed that the size of diagnostic catheter and weight were independently associated with DAP (R2=0.44, p<0.001) and AK (R2=0.53, p<0.001).

Conclusions: The 4 Fr diagnostic catheters are associated with decreased radiation exposure in patients undergoing transradial diagnostic coronary angiography, as reflected by decreased DAP, AK and FT values. These findings imply that catheter size should be taken into account to help minimise radiation dose.

Transradial coronary angiography in severe aortic stenosis: Left vs. right approach and 5 vs. 6 French diagnostic catheters

Konstantinos Kintis, Emmanouel Papadakis, Dionisis Antonatos, Christos Mantis, Charis Armonis, Konstantinos Thomopoulos, Michael Koutouzis, Ioannis Tsiafoutis, Areti Poulianitou, Kyriakos Dimitriadis and Sotiris Patsilinakos

Konstantopoulio General Hospital, INea Ionia, Greece

Introduction: Screening coronary angiography to assess associated coronary artery disease is important in patients with severe aortic stenosis (AoS), while the transradial approach is being increasingly adopted as the preferred vascular access. The aim of this study was to evaluate the safety and feasibility of using the left radial compared to the right radial approach and 5 French (Fr) compared to 6 Fr diagnostic catheters.

Method: A total of 200 patients with severe AoS and without a previous history of CABG (112 males, aged 73 years) underwent transradial coronary angiography. One hundred and thirty-six procedures were performed using the right (R) radial artery and 64 using the left (L) radial artery, while 100 were performed using 5 Fr diagnostic catheters and 100 6 Fr diagnostic catheters. Thus, 4 groups of patients were distinguished (R5, R6, L5 and L6). The primary end-points of the study were: procedural success, fluoroscopy time (FT), dose-area product (DAP) and amount of contrast agent.

Results: One-way analysis of variance between groups shown statistically significant difference in mean scores of FT and DAP between the 4 groups [F (3, 193)=10.8, p<0.0001 and F (3, 192)=4.8, p<0.05, respectively]. Post-hoc comparisons using the Tukey HSD test indicated that the mean FT and DAP for group R5 were differed significantly from the other 3 groups (6.67 ± 3.10 vs. 3.06 ± 1.89 minutes, p<0.001 and 38 627 ± 16 423 vs. 29 437 ± 15 761Gycm2, p<0.05, respectively). Amongst the other 3 groups, the FT and DAP were not significantly different. Multiple linear regression revealed that the radial approach, Fr diagnostic catheters and BMI were the independent predictors of FT after controlling for other variables (R2=0.378, p<0.001).

Conclusions: Right radial approach in conjunction with 5 Fr diagnostic catheters is accompanied by augmented FT and DAP in patients with severe AoS undergoing coronary angiography. These findings imply that catheter size and radial approach should be taken into account in these patients.

DORV spectrum: 45 patients over the past 10 years at Chris Hani Baragwanath Academic Hospital

David Kloeck[*] and Antoinette Cilliers[#]

[*]Gauteng Department of Health, Johannesburg, South Africa. [#]Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: DORV refers to a heterogeneous series of associated congenital cardiac anomalies that involve the right ventricular outflow tract in which both of the great (aorta and pulmonary) arteries arise entirely, or predominantly, from the right ventricle. The dysmorphology of DORV can vary from Tetralogy of Fallot-like anatomy on one end of the spectrum to complete transposition of the great arteries on the other end.

Methods: A retrospective descriptive study was done for the period June 2009 - June 2019. Data were extracted from the paediatric cardiology electronic database at CHBAH and additional information was obtained from hospital records.

Results: Forty-five patients were diagnosed with DORV, 30 (67%) male and 15 (33%) female. Age at first diagnosis ranged from day 1 of life to 2 years 3 months old, mean age of 8 months 3 weeks old (median of the data set=2 months old). Patients referred from Gauteng 36 (80%), North West province 6 (13.3%), Limpopo 1 (2.2%) and SADC 2 (4.4%). Using a surgical approach classification for DORV: 14 subaortic VSD (31.1%), 7 Fallot-type (15.56%), 5 Taussig Bing (11.11%), 13 multiple/remote VSD (28.89%) and 6 Hypoplastic RV/LV (13.33%). Cardiac surgical procedures were performed on 16 patients (35.56%). Associated documented dysmorphology in 21 patients (46.67%). Nine (20%) children demised with 7 (18%) children lost to follow-up.

Conclusion: DORV is a heterogenous congenital cardiac disease with multiple other cardiac and non-cardiac associations which require individualised patient management.

Regulation of cardiomyocytes hypertrophy: Impact of oestrogen and progesterone

Vitaris Kodogo*, Karen Sliwa* and Feriel Azibani#

*Hatter Institute for Cardiovascular Research in Africa, Department of Medicine, Faculty of Health Sciences, University of Cape Town, Rondebosch, South Africa. #University of Laribosiere, Paris, France

Introduction: Oestrogens and progestogens peak during pregnancy and could be responsible for the regulation of physiological and pathological pregnancy-related cardiac hypertrophy. However, the responsiveness of a target cell to a hormone also depends on the abundance of the target cell's hormone receptors, and influences exerted by other hormones. The interaction of oestrogen and progesterone as well as their involvement in the regulation of cardiac hypertrophy is not clear. This study elaborates on pregnancy hormones interactions and pathways involved during the regulation of cardiac hypertrophy.

Methods: Cardiomyocytes (H9C2) were treated with isoproterenol between passages 18 and 23 to induce cardiac hypertrophy. The hypertrophic cells were then treated with varying doses of individual and combinations of oestrogen and progesterone. The treated cells were stained with phalloidin immunofluorescent dye and cell sizes were measured by Image J software (NIH, USA). Real time PCR (Applied Biosystems, Life Technologies, USA) was used to validate cardiac hypertrophy and to distinguish between physiological and pathophysiological gene expression in the different treatments. Ongoing western blot experiments will determine the pathways involved and their interaction.

Results: Oestrogen does not induce hypertrophy on cardiomyocytes, even with increased dose. However, it inhibits cardiac hypertrophy induced by both isoproterenol and progesterone ($p<0.0001$). Cotreatment with isoproterenol and progesterone increased cell size. There was no difference between the hypertrophy induced by isoproterenol and that induced by progesterone alone, or a combination of both. Real time PCR of B-MHC and BNP confirmed the induction of pathological hypertrophy by isoproterenol and the hindering of pathological hypertrophy by oestrogen. However, progesterone does not induce the expression of foetal genes. However, progesterone increases overall protein synthesis. Combining oestrogen and progesterone promotes the expression of physiological genes.

Conclusion: Oestrogen prevents pathological cardiac hypertrophy induced by isoproterenol. Progesterone induces hypertrophy in cardiomyocytes by increasing protein synthesis. Combining progesterone and oestrogen promotes physiological hypertrophy.

A review of the access and socio-economic burden of cardiac surgery in South Africa

Jithan Koshy, Leon Scheepers, Annalize Ventzel and Jehron Pillay

Eastern Cape Department of Health, Bhisho, Eastern Cape, South Africa

Introduction: Cardiac surgical services in South Africa have been provided by public and private health care providers since the advent of cardiac surgery. Our study intends to describe in detail the access and socio-economic burden of cardiac surgery in the country.

Methods: We reviewed the distribution and services provided by cardiac surgical facilities within the country to evaluate the socio-economic burden of cardiac surgery.

Results: There are currently 91 health facilities in South Africa which offer cardiology, cardiac or thoracic surgery services. Of these facilities, 68 have cardiac catheterisation laboratories and 62 can facilitate open-heart surgery. Of these 62 facilities, 16% are public and 84% private. There are 132 registered cardiothoracic surgeons within these facilities with 67% in private practice alone, 8% in private and partly in public, 18% in public and partly in private and 6% in public alone. About 44% of them work in the Gauteng province, 26% in the Western Cape, 14% in KwaZulu-Natal and the rest in each of the other provinces. Nationally, about 8 400 open heart operations are conducted annually of which 29% are public and 71% private. An estimated 40% of all open-heart operations are conducted in Gauteng province. Our study estimated that the total public expenditure on cardiac surgery amounted to about ZAR300 million annually to conduct 2 450 operations nationally. The estimated ratio of the number of operations to the population 1: 5 422 in the Western Cape and 0:5 797 300 in Limpopo. Private sector cost was over ZAR1.6 billion a year accounting for about 2.8% of the total medical schemes hospital expenditure annually and 1.5% of the total out of pocket expenditure.

Conclusion: There is a marked inequality in access to cardiac surgery within the health sectors. The burden of access and unmet need of cardiac surgery remain high in both sectors.

A case of left heart aneurysm at the University Hospital Centre of Brazzaville

Ngolo Letomo, Gankama Thibault, Ondze Kafata and Ellenga Mbolla

University Hospital Centre of Brazzaville, Brazzaville, Republic of Congo

Background: Cardiac aneurysm is a well-defined entity with the first case reported by John Hunter in 1757.
Patient and method: This abstract presents the case of a 19-year-old man who was seen in external consultation at the University Hospital Centre.
Results: The patient presented with heart failure. Electrocardiogram (EKG) reported a sinus rhythm, chest x-ray showed a cardiomegaly and biology was without particularity. Transthoracic cardiac ultrasound showed a bulky aneurysm in doppler grade 3 leakage. A rare case of posterior leaf aneurysm was reported. Transesophageal echocardiography is much more sensitive. Endocardial sequela remains a possible aetiology but only a myocardial biopsy could inform further.
Conclusion: Heart aneurysm is a very rare pathology. Its location on posterior valve mitral is exceptional. The treatment in our country is limited to that afforded to heart failure. Surgery remains a dream.

Cardiovascular magnetic resonance characterisation of the phenotype of resistant uncontrolled hypertension

Pheletso Letuka

University of Cape Town, Rondebosch, South Africa

Introduction: Patients with resistant hypertension, who never achieve blood pressure (BP) control despite maximal medical treatment, represent a distinctive phenotype which differs from the extensive proportion of patients whose BP can be controlled. Our aim is to identify patients with resistant uncontrolled hypertension and to compare their phenotype to resistant controlled hypertensives and healthy controls.
Methods: Fifty patients were enrolled from the Groote Schuur Hospital Hypertension Clinic: 30 with resistant uncontrolled hypertension, the other 20 with resistant controlled hypertension. Twelve age- and sex-matched healthy controls were enrolled. Assessments included clinical examination, electrocardiography, echocardiography, applanation tonometry, serum biomarkers and cardiovascular magnetic resonance (CMR).
Results: Patients with RHTN had significantly higher systolic (155.6 ± 21.6mmHg, p<0.0001), diastolic (88.4 ± 14.5mmHg, p=0.03) BP, mean arterial BP (115.4 ± 17.2mmHg, p=0.004) and pulse pressure (67.3 ± 14.2mmHg, p=0.001). Furthermore, they had significantly lower small artery elasticity (4.1 ± 2.1 vs. 6.9 ± 3.6 vs. 3.3 ± 1.3ml/mmHgx100, p<0.0001) and higher systemic vascular resistance (1 754 ± 418.4 vs. 1 363 ± 371.5 vs. 1 907 ± 474dyneXsecXcm-5, p=0.002). On CMR, both patient groups had lower left ventricular (LV) end-systolic volumes (p=0.02), higher LV stroke volume (p=0.006) and LV ejection fraction (p<0.0001). Both groups of patients had higher right ventricular ejection fraction (p<0.0001).
Conclusion: In summary, patients with resistant uncontrolled hypertension are more likely to suffer target end organ damage as a result of vascular and concentric remodelling.

Adherence to secondary prophylaxis for rheumatic fever with Benzathine penicillin: Pilot programme in Maputo, Mozambique

Edna Lichucha and Ana Olga Mocumbi

Instituto Nacional De Saúde, Marracuene District, Mozambique

Introduction: Rheumatic heart disease (RHD) is the result of an immune process resulting from Group A Beta-haemolytic streptococcal infection. It is a public health problem in Mozambique, given the high prevalence in school populations with the first indication for cardiovascular surgery due to acquired disease. In the absence of a surveillance system for RHD, we performed a prospective observational study and we implemented a pilot prevention and control programme to assess adherence to secondary prophylaxis using Benzathine penicillin G (BPG).
Methods: We conducted the study from November 2017 - October 2018 at Maputo Central Hospital. The BPG injection sessions are held twice a week, Tuesdays and Thursdays, at the Cardiology Unit. Standardised data were collected from each patient regarding socio-demographic characteristics, place of residence, clinical history and events related to BPG-injection. Descriptive statistics were used to analyse data.
Results: We recruited 105 patients, 70 (66.67%) were female; mean age 20, SD 6 years. Thirteen participants (12.4%) were children aged 8 - 12 years and 38 (36.2%) were adolescents. The majority of the participants 67 (63.8%) were students. We administered 1 139 doses of BPG, of which 864 (75.85%) were on schedule. For 134 (11.76%) doses, patients were out of schedule for more than 5 days, and for 141 (12.38%) there was up to 5 days delay. Two deaths (2/1 139 injections) occurred during BPG-injection, both in adolescents with severe disease in whom no classic signs of anaphylaxis

occurred. Adherence to BPG was 76%, not reaching the 80% considered acceptable by the WHO; it did not vary over the year. The longest distance participants travelled from home to the hospital was 15.8km and 14 (13.3%) participants who were not adherent, resorted to this group.

Conclusions: Adherence to secondary prophylaxis with BPG was low. A need exists to better understand the underlying reasons for deaths related to BPG.

Predictors of 1-year survival in South African transcatheter aortic valve implant candidates

Jacques Liebenberg, Hellmuth Weich and Anton Doubell

Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa.

Introduction: Transcatheter aortic valve implant (TAVI) is undergoing rapid expansion internationally. In lieu of local resource constraints, a major challenge in applying this technology is the identification of patients most likely to benefit. The development of risk prediction models has proven elusive with reported area-under-the-curve (AUC) of 0.6 - 0.65. The available models were developed in a first world setting and may not be applicable to South Africa. The purpose of this study is to evaluate unique South African parameters in TAVI outcome prediction.

Methods: Our experience and VARC defined outcomes with 244 successive TAVI implants were previously reported. This cohort was now used to evaluate preprocedural variables for their impact on 1-year survival using univariate and multivariate models.

Results: Factors found not to correlate with outcome included: age, renal function, aortic valve gradients as well as the commonly used surgical risk prediction models - the STS and Euro SCORE. Factors best associated with 1-year survival were: left ventricular end-diastolic dimension (LVED) (mm), body mass index (BMI) (kg/m^2) and ejection fraction (EF)(%) (favouring smaller LVED and higher EF and BMI), absence of atrial fibrillation (AF), as well as 3 novel parameters: independent living, ability to drive a car and independent food acquisition/cooking. Discriminant analysis of these factors yielded an AUC of 0.8 (CI 0.7 - 0.9) to predict 1-year survival with resubstitution sensitivities and specificities of 72% and 71% respectively.

Conclusion: Apart from existing predictors, we identified 3 novel risk predictors (independent living, ability to drive a car, and independent food acquisition/cooking) for 1-year survival. In this early evaluation, these parameters performed well with an AUC higher than the parameters used in many international studies. The parameters are inexpensive and easily obtained at the initial patient visit. If externally validated, they may be valuable in assessing prospective South African TAVI candidates.

A rare case of giant circumflex coronary artery aneurysm in an elderly female

Liam Lorentz*, Ananius Tshiove# and Ruchika Meel#

*Chris Hani Baragwanath Academic Hospital, Johannesburg, South AfricaAfrica. #Chris Hani Baragwanath Academic Hospital and the University of the Witwatersrand, Johannesburg, South AfricaAfrica

Introduction: Giant coronary artery aneurysms are rare. Multiple causative factors have been reported such as: atherosclerosis, Takayasus arteritis, congenital disorders, Kawasaki disease and coronary intervention. Herein, we describe a rare case of a giant circumflex coronary artery aneurysm.

Methods: We describe a case of giant circumflex artery aneurysm using echocardiography and a contrast-enhanced 128-slice multidetector computed tomography (MDCT).

Results: A 74-year-old female presented with symptoms of dyspnoea and atypical chest pain of 1-month duration. She had no history of previous hospitalisation or any known co-morbidities. Her resting electrocardiogram demonstrated atrial ectopic beats. Chest x-ray revealed an enlarged cardiac silhouette. All blood tests were normal. Echocardiogram showed bi-atrial enlargement and mildly reduced left and right ventricular systolic function. There was moderate to severe functional tricuspid regurgitation and moderate mitral regurgitation complicated by pulmonary hypertension. A large aneurysm involving the circumflex artery was noted to arise in the atrio-ventricular groove, it had a beaded tortuous appearance and continuous flow was noted in the structure on Doppler study. It was pulsatile in nature and compressed the lateral left atrial wall. Patient underwent cardiac CT which revealed a giant tortuous left circumflex coronary artery. There was enlargement of the entire circumflex from the ostia to the distal artery. The distal artery was aneurysmal (56.8 x 10.9mm) as it drained into the coronary sinus through a fistula, which resulted in left to right shunt and this likely contributed to the patient's symptoms. She refused any form of intervention and was put on medical therapy, including beta blockade, aspirin and diuresis.

Conclusion: We have presented an unusual case of giant circumflex coronary artery aneurysm with a fistula into the coronary sinus. Additionally, MDCT allowed visualisation of the coronary artery aneurysm and its anatomic relationship to the adjacent structures.

Investigating key factors that influence quality of life in implantable cardioverter defibrillator patients in the cardiac clinic at Groote Schuur Hospital

Anna Louisa Luscombe[*], Charle Viljoen[#], Wisdom Basera[†], Mark Verryn[†], Khonzanani Mbatha[‡] and Chin Ashley[◊]

[*]Department of Psychology, University of South Africa, Pretoria, South Africa. Division of Cardiology, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa. [#]Division of Cardiology, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa. [†]Department of Medicine, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa. [‡]Department of Psychology, University of South Africa, Pretoria, South Africa. [◊]Division of Cardiology, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa

Introduction: An implantable cardioverter defibrillator (ICD) can be lifesaving. Quality of life (QOL), however, can be influenced by patient-, disease- and ICD-related factors. Factors which influence QOL have not been investigated in South Africa. This study aimed to identify patient demographic, clinical, ICD and support characteristics associated with anxiety, depression and QOL in a cohort of ICD patients followed up in the ICD clinic at Groote Schuur Hospital (GSH).

Method: A descriptive, cross-sectional study was performed. Patients completed a Demographic and Clinical Questionnaire, the Hospital Anxiety and Depression Scale (HADS) and the SF-36v2 Health Survey. Descriptive analyses of the questionnaires were performed.

Results: Seventy patients (mean 57 years, 65% male) participated in the study. Most (86%) patients had ICDs implanted for secondary prevention and 79% had a history of documented ventricular tachycardia, 60% of patients had received prior ICD shocks. The HADS scale showed that 20 (28.6%) patients suffered from anxiety (scores >8) and 15 (21.4%) from depression (scores >8). The SF-39v2 survey showed impaired QOL (scores <50) in all patients: Physical Component Summary (PCS) 43.83 (SD 9.43); Mental Component Summary (MCS) 47.81 (SD 10.71). Key factors associated with anxiety, depression and QOL were: being female (anxiety), unemployed (low physical QOL), physically and emotionally dependent (low mental well-being), palpitations, inappropriate shocks, cardiac pre-occupation, ICD failure fear (anxiety, depression, low QOL) and >5 shocks (anxiety, depression). Counselling was important for most patients (90%) and 44% felt communities did not understand ICDs. Patients with a positive outlook were 10.46 times more likely to have mental well-being.

Conclusion: This study showed that patients with ICDs have a high prevalence of anxiety, depression and impaired QOL which are strongly associated with low socio-economic status, ICD concerns and support. This highlights the need for clinical, psychological and social support of patients living with ICDs.

Effect of mitral valve replacement on left ventricular function in subjects with severe rheumatic mitral regurgitation

Sharen Maharaj[*], Datshana Prakesh Naidoo[#] and Somalingum Ponnusamy[*]

[*]Department of Health, Dalbridge, Durban, KwaZulu-Natal, South Africa. [#]University of KwaZulu-Natal, Durban, KwaZulu-Natal, South Africa

Introduction: Outcomes in patients with severe mitral regurgitation (MR) and impaired ejection fraction (EF) is poorly described in the developing world where rheumatic heart disease is endemic. This study describes the effects of mitral valve replacement (MVR) on left ventricular (LV) function in patients with rheumatic MR.

Methods: This is a retrospective analysis of all subjects with severe rheumatic MR undergoing MVR over a 9-year period (2005 - 2013). Clinical and echocardiographic parameters were recorded pre-operatively, at 2 weeks, 6 weeks to 3 months and 6 months following MVR.

Results: Of 132 patients included in the study, 66% (n=87) were NYHA class III - IV and 38% (n=50) presented with heart failure. Pre-operatively, 28% (n=37) of subjects had impaired LV function (EF <60%), and the mean LVEDD and LVESD was 60.7 ± 7.9mm and 39.9 ± 7.2mm, respectively. The mean LA size was 61.2 ± 12.6mm. Paired analysis of 83 patients with complete datasets revealed that the EF was >55% in 87% (n=72) pre-operatively, and this number fell to 20% (n=17) at 2 weeks post-operatively (p<0.001, 95% CI 0.02 - 0.09). At 6-month follow-up the EF was >55% in 60% (n=53) (p<0.001, 95% CI 0.1 - 0.5). In this subset of patients, pre-operative mean LVEDD and LVESD were 60.2 ± 7.9mm and 39.9 ± 6.6mm, respectively. The mean LA size was 61.9 ± 10.1mm. Pre-operative EF was 63% (IQR 58 - 70%) and 57% (IQR 52 - 63%) at 6-month follow-up (p<0.001).
On multivariate analysis only the ESD emerged as a significant predictor of postoperative LV dysfunction.

Conclusion: Impaired LV contractility is frequently common in chronic severe MR and fails to recover fully by the 6-month visit in over a third of subjects. The less than ideal post-operative outcome calls for early evaluation of subjects with severe MR with a view to timeous surgery in order to ensure preservation of ventricular function.

Efficacy and safety of different dosages of Rosuvastatin in Bangladeshi patients: A multi-centre real-world study

Abdullah Al Shafi Majumder*, Toufiqur Rahman#, A.K.M. Monwarul Islam†, Mohammad Ullah‡ and Alimur Reza◊

*Popular Medical College and Hospital, Dhaka, Bangladesh. #Colonel Malek Medical College, Manikganj, Bangladesh. †National Institute of Cardiovascular Diseases, Dhaka, Bangladesh. ‡Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh. ◊Beximco Pharmaceuticals Ltd, Dhaka, Bangladesh

Introduction: Dyslipidemia, a risk factor for ischaemic heart disease and stroke, is a major contributing cause to the disease burden in Bangladesh. Rosuvastatin is one of the most potent statins available for reducing low-density lipoprotein cholesterol (LDL-C) levels. It is widely prescribed and well accepted by the patients in Bangladesh. The cost of Rosuvastatin is similar to that of other statins used in Bangladesh. However, the effectiveness of Rosuvastatin in Bangladesh has not been adequately studied. Therefore, this study was conducted in an effort to understand the efficacy and safety of Rosuvastatin in a real-world setting in Bangladesh.

Methods: This was a single-arm, non-intervention, multi-centre, real-world study conducted in Bangladesh. Adult patients prescribed Rosuvastatin (5, 10 or 20mg) were enrolled in the study. The patients were observed with the objective of assessing the percentage change from baseline in serum lipid profile and assessing the proportion of patients reaching the LDL-C target goal of <100mg/dL after 12 weeks of therapy.

Results: A total of 280 patients were enrolled, with mean age 51.56 years, mean body mass index (BMI) 26.43kg/m^2, mean baseline LDL-C 155.35mg/dL. Overall, the mean LDL-C levels declined by 32.1% (49.9mg/dL) from baseline to end-of-study, while the mean TC levels declined by 24.8% (58.8mg/dL) and the mean HDL-C level increased by 16.71% (5.7mg/dL). The proportion of patients who attained the LDL-C goal (LDL-C <100mg/dL) in 5, 10 and 20mg dosage group was 24%, 49.21% and 65.71%, respectively. On logistic regression analysis, higher BMI and use of clopidogrel reduced the odds of attaining LDL-C goal. Overall, 10.4% of all patients reported an adverse event (AE) at the end of the study. Most AEs were reported in the muscle (6.5%) and GI categories (6.8%).

Conclusion: This study demonstrates that all dosages of Rosuvastatin was effective in lowering TG and raising HDL-C in addition to lowering its primary target LDL-C in Bangladesh. High dosages of Rosuvastatin have no significant safety risk in Bangladeshi patients.

Chronic stress phenotype and brain-heart injury

Leone Malan, Faans Steyn and Pieter van Vuuren

North-West University, Mahikeng, Vanderbijlpark, South Africa

Introduction: Ongoing ischaemia activates calcium-binding protein B (S100B) release from astrocytes in the brain, retinal ganglion cells and myocardium. S100B elevations were associated with depression, brain injury, optic nerve axon damage and glaucoma risk in rodent models. Whether S100B release will reflect these changes in the human brain-heart axis when stress is evident is not known and thus assessed in this study.

Methods: A clinical diagnostic instrument was validated to phenotype chronic emotional stress (STRESS). A prospective bi-ethnic sex cohort (n=359; aged 46 ± 9 years) with similar socio-economic status was stratified into STRESS cases and controls. Three-year changes (Δ) were obtained for ambulatory 24-hour BP, fasting serum S100B and high-sensitive cardiac troponin T (cTnT). Serum was analysed by electrochemiluminescence immunoassays. At 3-year follow-up, retinopathy was quantified from digital images in the mydriatic eye and diastolic-ocular-perfusion-pressure, indicative of perfusion deficits and glaucoma risk, was measured.

Results: Irrespective of race, STRESS cases (n=236; men=64%) showed increased risk (p≤0.001) with prevalence exceeding established cut-points for chronic 24-hour hypertension (≥130 and/or 80mmHg: 90% vs. 10%), S100B (≥0.1 µg: 67% vs. 33%) and cTnT (≥4.2 ng/L: 77% vs. 23%) compared to controls (n=123). STRESS cases presented increased retinopathy (71% vs. 29%) and diastolic-ocular-perfusion-pressure levels (p≤0.001) compared to controls at 3-year follow-up. Consistent higher S100B [odds ratio 1.13 (95% CI 1.0 - 1.2), p=0.02] and diastolic-ocular-perfusion-pressure [odds ratio 1.21 (95% CI 1.1 - 1.11), p≤0.001] levels were associated with STRESS. Controls demonstrated values within established reference ranges and no associations with risk markers.

Conclusion: Novel data are presented where a chronic stress phenotype was associated with perfusion deficits in the human brain-heart axis. Homeostatic reflexes may facilitate blood pressure increases to alleviate perfusion deficits and explain the strong interdependency of STRESS on hypertension prevalence. Early screening for STRESS and diastolic-ocular-perfusion-pressure may lessen susceptibility of brain-heart injury and glaucoma risk.

Pulmonary atresia with intact ventricular septum: A review of 2 cases that underwent attempted radiofrequency perforation at Chris Hani Baragwanath Academic Hospital

Vijay Mammen and Antoinette Cilliers

Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Pulmonary valve atresia with intact interventricular septum (PA-IVS) is defined by a membranous or muscular atresia of the right ventricular outflow tract and an intact ventricular septum. Early establishment of antegrade flow through the atretic pulmonary valve (PV) should be considered, if the anatomy is favourable. This gives the right ventricle the maximum opportunity to increase in size. This can be done with catheter valvotomy using radiofrequency perforation of the PV or surgery. Radiofrequency perforation of the PV is the current standard of care in suitable patients.

Methods: Two cases of PA-IVS that underwent attempted radiofrequency perforation of the PV in 2018 at Chris Hani Baragwanath Academic Hospital (CHBAH) were reviewed.

Results: Case 1 was a 10-day-old female (3.5kg) with a tripartite right ventricle (RV), well developed infundibulum, tricuspid valve (TV) z-score of -2.9, TV to mitral valve (MV) ratio of 0.6:1, membranous PV plate diameter of 5mm - 6mm (-3.7 - -2.5 z-score) and no RV-dependent coronary circulation. We performed radiofrequency perforation and subsequent balloon dilatation of the PV that was successful. The patient is currently 8 months old and doing well. Case 2 was a 2-month-old female (3.8kg) with a small bipartite RV, underdeveloped infundibulum, TV z-score of -1.7, TV:MV ratio of 0.56:1, membranous PV plate diameter 3.5mm - 5 mm (-6.6 - -4.1 z-score) and no RV-dependent coronary circulation. She also had an Ebstenoid-like TV and moderate to severe TV regurgitation. The procedure was unsuccessful. We also had the added complication of an inadvertent perforation of the right ventricular outflow tract which caused a small pericardial effusion that subsequently resolved. The patient was awaiting a BT-shunt procedure but subsequently demised before surgery due to sepsis.

Conclusion: PA-IVS can safely be managed with radiofrequency perforation of the PV, if the anatomy is favourable. However, patient selection is an important step to acquiring a successful result.

Congenital heart disease in Angolan children: From diagnosis to surgical treatment

Valdano Manuel[*], Gade Miguel[#], Humberto Morais[†], Maria Ana Sampaio Nunes[‡], Sebastiana Gamboa[◊], Albino Pedro[#], Gilberto Leon[#], Manuel Pedro Magalhâes[‡], Telmo Martins[#] and António Pedro Júnior[#]

[*]Clinica Girassol, Luanda, Angola. [#]Cardio-Thoracic Centre, Clínica Girassol, Luanda, Angola. [†]Cardiology Department, Hospital Militar Principal/ Instituto Superior, Luanda, Angola. [‡]Cardio-Thoracic Centre, Clínica Girassol, Luanda, Angola. Paediatric Cardiology Department, Cardiac Surgery Department, Portuguese Red Cross Hospital, Lisbon, Portugal. [◊]Paediatric Hospital David Bernardino, Luanda, Angola

Introduction: In developing countries, the prenatal diagnosis of congenital heart disease (CHD) is scarce and few have benefited from surgical treatment. Angola is not unique in this African reality. We share the experience of a cardiothoracic centre in Angola which aims to treat simple to complex CHD in the context of Portugal-Angola collaboration.

Methods: This is a retrospective study of patients younger than 18-years-old with CHD who underwent surgery in a single centre in Angola from 2011 - 2017.

Results: We operated 1 691 patients with mean age of 4.2 years (range 0 - 19.7), weight 12.7kg (2.4 - 65); 906 were females (53.6%) and 785 (46.4%) were male. Only 421 (24.9%) patients were operated under the age of 1 year. The most common acyanotic CHD was ventricle septal disease with 429 (25.6%) patients and cyanotic CHD was tetralogy of Fallot with 238 (14.1%) patients. We performed 659 (39%) surgeries for complex CHD. There were 243 cases of post-operative complications (14.4%), of these, 4.5% (11) needed re-operation. The most common complication was pericardial/pleural effusion. The in-hospital mortality was 104/1 691 (6.2%).

Conclusion: Congenital heart surgery can be done with safe and good results in Angola. Early detection, a referral system and follow-up must be improved. Due to a lack of resources, we should focus on the treatment of curable malformations.

Infective endocarditis: A retrospective review and 10-year experience at SBAH

Dellina Manzini [*] ***and Jayneel Joshi*** [#]

[*]Department of Health, Pretoria, South Africa. [#]Steve Biko Academic Hospital, Pretoria, South Africa

Introduction: Infective endocarditis (IE) is a rare and potentially devastating form of acquired heart disease that can cause significant morbidity and mortality in paediatric patients, particularly those with pre-existing congenital heart disease (CHD).

Aim: To evaluate patients who were diagnosed with IE over a 10-year period; focusing on risk factors, treatment modalities and mortality.

Methods: A retrospective descriptive study was conducted over a 10-year period at Steve Biko Academic Hospital (SBAH), to review patients who were diagnosed with infective endocarditis for the period June 2009 - June 2019. Data was extracted from the paediatric cardiology book database and hospital records. Additional information was obtained from our laboratory electronic data base.

Results: A total of 39 patients were diagnosed with infective endocarditis during the study period. The age ranged from the neonatal period (21 days) to the teenage years (17 years). The most common bacterium isolated was Staphylococcus aureus and the most common fungus was Candida Albicans. In the neonatal population, risk factors for developing infective endocarditis was the presence of central lines, prematurity and fungal septicaemia. Risk factors for infective endocarditis in the older population was pre-existing CHD and previous surgery for CHD. Following diagnosis, 4 patients (10%) underwent surgical vegetectomy. The majority of patients were treated medically with antibiotics for a minimum duration of 6 weeks (90%). There was a high case fatality rate 8/30 (21%).

Conclusion: Infective endocarditis remains an acquired heart disease with a high mortality with well identified risk factors. Due to the acute and complicated course, high awareness and prompt diagnosis as well as adequate prophylaxis is crucial.

Relationship between micro-albuminuria and reduced glomerular filtration rate with blood pressure level in Black hypertensive patients in Brazzaville (Republic of the Congo): Preliminary results

Bertrand Fikahem Ellenga Mbolla [*]***, Arousse Mampouya*** [#]***, Christian Kouala Landa*** [†]***, Koumou Fylla-Onanga*** [#] ***and Suzy-Gisele Kimbally Kaky*** [*]

[*]Faculty of Health Sciences, Marien Ngouabi University, Brazzaville, Republic of the Congo. [#]Laboratory of Biochemistry; University Hospital of Brazzaville, Brazzaville, Republic of the Congo. [†]Department of Cardiology, University Hospital of Brazzaville, Brazzaville, Republic of the Congo

Introduction: The evaluation of micro-albuminuria/glomerular filtration rate (GFR) is difficult due to its availability and low-income patients. The purpose of this study was to determine the frequency of micro-albuminuria and reduced GFR.

Method: This cross-sectional study was conducted from June 2018 - December 2018 in Black hypertensive outpatients at the University Hospital of Brazzaville. Low income was defined as income below the minimum monthly salary in the Republic of the Congo. The GFR was calculated by the MDRD formula. The grading of hypertension was done in accordance with the 2018 ESH hypertension guidelines.

Results: In total, 104 patients (57 women) were included. The patients resort in a low-income bracket (n=27.26%). Hypertension (HT) was identified and treated (n=74, 71.2%). Treatment included: ACE inhibitors (n=48, 46.2%) and calcium channel blockers (n=46, 44.2%). The mean systolic blood pressure (BP) was 172.6 ± 2407mmHg, and 104.8 ± 15mmHg for diastolic BP. The level of HT was grade 1 (n=17, 16.3%), grade 2 (n=26, 25%) and grade 3 (n=59, 56.7%). The mean blood creatinine was 12.6 ± 9.5mg/L and the average GFR was 83.8 ± 35.3mL/min. Micro-albuminuria was noted in 39 cases (37.5%). Reduced GFR was reported in 29 cases (28%). The relationship between micro-albuminuria and BP level was: grade 1 HT (n=7, 41%, OR 1.2, 95% CI 0.4 - 3.47), grade 2 (n=7, 27%, OR 0.52, 95% CI 0.19 - 1.4), grade 3 (n=24, 40%, OR 1.37, 95% CI 0.61 - 3.07). The relationship between reduced GFR and BP level was: grade 1 HT (n=7, 41%, OR 2.06, 95% CI 0.7 - 6), grade 2 (n=8, 30.7%, OR 1.2, 95% CI 0.45 - 3.18) and grade 3 (n=13, 22%, OR 0.51, 95% CI 0.21 - 1.21).

Conclusions: Micro-albuminuria/reduced GFR are frequent and associated with high BP levels in hypertensive patients. Action must be taken to identify common biological cardiovascular risk-factors.

Quality of life in patients with chronic heart failure in Brazzaville (Republic of the Congo)

Bertrand Fikahem Ellenga Mbolla*, Bijou Moualengué#, Solange Flore Mongo Ngamami#, Christian Kouala Landa#, Rog Paterne Bakekolo#, Jospin Makani Bassakouahou#, Meo Ikama* and Suzy-Gisèle Kimbally Kaky

*Faculty of Health Sciences, Marien Ngouabi University, Brazzaville, Republic of the Congo. #Department of Cardiology, University Hospital of Brazzaville, Brazzaville, Republic of the Congo

Introduction: Chronic heart failure (CHF) is worldwide regarded as a public health problem which impacts patients' everyday lives. The aim of this study was to determine the associated poor quality of life (QoL) factors in patients with CHF.

Methods: This cross-sectional study was conducted from March to December 2018 at the Department of Cardiology of the Teaching University Hospital of Brazzaville. We included outpatients with compensated CHF following an ambulatory consultation. The Framingham criteria were used for the diagnosis of HF. For the evaluation of QoL, the Minnesota Living with Heart Failure Questionnaire (MLHFQ) was used.

Results: Ninety-one patients, 58 women (63.7%), were included. The mean age was 61.8 ± 12.7 years. Patients were aged 60 years and older (n=48, 52.8%) and belonged to a low-income bracket (n=79, 86.8%). CHF had been evolving for over 3 years in 28 cases (30.8%). Rehospitalisation for HF was 39 (42.9%). Comorbidities were hypertension (n=58, 63.7%) and diabetes (n=10, 11%). Left ventricular ejection fraction was under 40% in 52 cases (57.1%). Patients had poor adherence in 25 cases (27.5%). Stress dyspnea was reported in 27 cases (29.7%). The mean MLHFQ score was 18 ± 14.9 points (range: 0 and 78 points). Poor QoL was noted in 17 cases (18.7%). The psychological and physical domains contributed to poor QoL. The associated factors of poor QoL were: rehospitalisation (n=39, 42.9%, OR 4.18, 95% CI 1.3 - 13.1, p=0.02), dyspnea (n=27, 29.7%, OR 13.9, 95% CI 3.9 -49.2, p<0.001), poor adherence (n=10, 58.8%, OR 5.6, 95% CI 1.8 - 17.2, p=0.002), tachycardia (n=10, 58.8%, OR 6.7, 95% CI 2.1 - 21, p=0.001) and reduced mobility during the 6 minute walk test (n=4, 23.5%, OR 14, 95% CI 1.7 - 113, p=0.006). Low income was not associated with poor QoL (n=14, 82.4%, OR 0.64, 95% CI 0.15 - 2.6, p=0.5).

Conclusion: Factors associated with poor quality of life in patients living with CHF are: rehospitalisation, dyspnea, reduced mobility and poor adherence. Effective actions must be taken to improve therapeutic education.

Atrial myxoma: A report of 5 cases

Moleboheng Molopa*, Shungu Mogaladi# and Ruchika Meel†

*Gauteng Department of Health, Johannesburg, South Africa. #Charlotte Maxeke Johannesburg Academic Hospital, Johannesburg, South Africa. †Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Atrial myxomas are rare tumours with an occurrence of 0.02%. There are few case reports from Africa, the last report comprised 5 patients over a period of 10 years. Herein, we report 5 cases of atrial myxoma over the period of a year.

Methods: We reviewed clinical, echocardiographic and histology of 5 cases of atrial myxoma which were operated on at Charlotte Maxeke Academic Hospital over a 1-year period.

Results: Five patients with atrial myxoma are described. The case series comprised 4 females and 1 male with a mean age of 44.8 years (youngest 23 and oldest 79 years), all Africans. Dyspnea and coughing being the most common presentation and a tumour plop was heard in all patients with left atrial (LA) myxoma. Systemic embolic presentations included dry gangrene of the left hand 5th digit and expressive aphasia. Ascites and pedal oedema were noted with right atrial (RA) myxoma. Twenty percent presented with anaemia needing transfusion. On echocardiography, all had preserved ejection fraction, atrial myxoma was noted in the LA in 60% of the patients and 40% in the RA. Forty percent of patients had functional tricuspid regurgitation and 40% had mitral inflow obstruction. The mean size of the myxoma on echocardiography was 12mm x 22mm. Intra-operatively, all specimens were pedunculated, friable gelatinous masses with mean size of 10mm x 25mm. One RA myxoma was protruding into the IVC, deep hypothermic circulatory arrest was initiated to inspect the IVC for tumour extension. Modified De Vega tricuspid annuloplasty was performed in patients with RA myxoma. Histological findings were in keeping with atrial myxoma in all cases. Mean post-operative stay was 5 days. All patients had uneventful hospital stays and were discharged home and remained well on follow-up.

Conclusion: We have described 5 cases of myxoma with unique presentations.

Tricuspid atresia: A retrospective review and 20-years' experience at a large SA tertiary care centre

Mohamed Monareng and Antoinette Cilliers

Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Tricuspid atresia (TA) accounts for 1% - 3% of congenital heart defects. It is the third most common form of cyanotic congenital heart lesions. It is a single ventricle defect and results from a complete lack of formation of the tricuspid valve that leads to hypoplasia, or absence of the right ventricle. The objectives of this study was to review cases with TA seen at Chris Hani Baragwanath Academic Hospital (CHBAH) Paediatric Cardiology Unit (PCU), Soweto, Gauteng, over a 20-year period and to document the clinical outcomes.

Methods: Retrospective, descriptive study of children diagnosed with TA over the past 20 years. Data were extracted from the paediatric cardiology electronic database at CHBAH.

Results: A total of 115 patients were diagnosed with a median age at diagnosis of 2 months (range, day 1 - 23 years). Female to male ratio 1:0.85. The most common anatomical types were: type 1 (82.6%), type 2 (16.5%) and type 3 (0.9%). Of type 1, 62% had 1B, 21% had 1A and 17% had 1C. Of type 2, 37% had 2B, followed by 32% for both types 2A and 2C. Only 1 patient had type 3B and none had 3A. Most frequent presenting feature was cyanosis (100%). A total of 54 patients underwent surgery; 33 had a Blalock-Taussig (BT) shunt initially of which 7 proceeded to at Glenn shunt and 1 to a Fontan operation. Fifteen patients had an initial Glenn shunt of which 1 had a Fontan. Six patients with increased pulmonary blood flow had an initial pulmonary artery band of which 1 proceeded to a Glenn shunt. The overall case fatality rate was 26% ascribed to the cardiac lesion and sepsis post-surgery.

Conclusion: The majority of patients have TA 1B. Management is a series of complex operations. Only half of the study cohort underwent surgery. The case fatality rate is high.

Special features of acute coronary syndrome in Ramadan: Prospective study of a North-African population

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Data on the effect of Ramadan on coronary heart disease are rare and controversial. The purpose of our survey is to determine the impact of Ramadan on the prevalence of acute coronary syndrome (ACS) in a population of patients followed in our cardiology department.

Methods: This is a prospective study, carried out at the Department of Cardiology and Vascular Diseases in our setting during 2 successive Ramadan periods (2017 - 2018) for a duration of 3 months (1 month before, 1 month during and 1 month after Ramadan). We included all patients admitted for ACS during the study period. The data were collected on a standardised form. We performed a mono- and multivariate analysis of the results.

Results: During the 6-month period of the study, we included 153 patients admitted for ACS with (43%) and without (57%) ST-segment elevation. The prevalence of ACS amongst hospitalised patients over this period was 15% a month before Ramadan, 19% during Ramadan and 27% a month after Ramadan. According to the results of the multivariate analysis, the risk of ACS is not increased in the Ramadan month, and is greater during the following month. In a subgroup analysis of the population of patients with ACS occurring during the month of Ramadan, we found an increased risk of ACS in men over 60 years of age, and those with hypertension or diabetes. The period including Ramadan and the month following it is not associated with an increased risk amongst subjects with no more than 1 cardiovascular risk factor (other than age, hypertension and type 2 diabetes).

Conclusion: The prevalence of ACS is not increased in the month of Ramadan, except in elderly hypertensive and diabetic patients. The increased risk of ACS the following month can be explained by the inadequate lifting of the dietary restriction. More studies need to be done to better explain this difference in prevalence.

Peripheral arterial disease of the lower limbs in Moroccan hypertensive non-diabetic patients, prevalence and determining factors: Prospective survey of 273 patients

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Peripheral arterial disease (PAD) of the lower limbs is just a single aspect of the multivessel disease. It announces cardiovascular accidents. The early screening of PAD is a major issue. The purpose of this study was to evaluate the prevalence of PAD of the lower limbs in asymptomatic patients with hypertension, and to determine risk factors, or associations of risk factors, most frequently responsible for the pathological ankle-brachial index (ABI) (<0.9).

Methods: We conducted a prospective survey, of 13 months' duration from November 2016 - December 2017, in Mohammed the VIth University Hospital of Marrakech, Morocco. A total of 273 hypertensive patients followed-up in this setting were included.

Results: The mean population age was 62.09 years (27 - 88 years), with a male predominance (67.76%). The prevalence of PAD was 28.94%. Risk factors, or risk factors significantly associated with PAD (Chi-square Pearson test), are: • Male gender 72%. • Tobacco use 56%. • Obesity (BMI>=30) 15.8%. • Dyslipidemia and grade 3 hypertension 23.4%

Conclusion: PAD of the lower limbs is a particular location of the atheromatous process as well as a marker of its diffusion. As a result of this study, we recommend the screening of asymptomatic PAD in all hypertensive patients by measuring the ankle-brachial index.

Evaluation of patients' knowledge regarding the management of their treatment with Vitamin K Antagonist drugs: Prospective study of about 100 patients

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Vitamin K antagonists (VKA), the most widely prescribed oral anticoagulant treatment, carries a significant iatrogenic risk, often secondary to insufficient information shared with patients regarding the management of their treatment.

Methods: This was a descriptive cross-sectional survey conducted at our medical centre. A questionnaire (19 items) was administered to patients who had recently been on VKA (for at least 1 week) on 3 short assessment visits at an approximate 1-month interval. We evaluated their initial knowledge level and then recorded the evolution of their knowledge through 3 assessment sessions. During this period all patients received normal care from their attending physician. Duration of the study was 29 months, including recruitment and monitoring of patients (January 2015 - May 2017).

Results: One hundred patients were included in the study, 47 men and 53 women. The average age was 38 ± 16 years old. Valvular diseases and venous thromboembolism justifying the institution of VKA treatment were noted in 35% and 27% of cases, respectively. Thirty-nine percent of patients indicated that they had not received information regarding their treatment. The names of the VKA and the exact reason for the treatment were known in 25% and 30% of cases, respectively, at the first consultation. Thirty-six patients cited INR as a laboratory-based monitoring of treatment and only 28 patients were aware of the target values. The majority of patients were unaware of the risks of overdose (60%) and underdosing (52%). Nonsteroidal anti-inflammatory drug self-medication was reported by 26 patients. A positive evolution of knowledge at the end of the study was noted in only 58 patients, but with an average score not exceeding 09 ± 2/19 items.

Conclusion: Patients' knowledge of VKA management was fragmentary and insufficient to ensure safe and effective treatment. At the end of this study, we created an information booklet regarding the monitoring of patients under VKA in French and Arabic.

Peripheral arterial disease of the lower limbs in asymptomatic diabetic patients: Prevalence and determining factors

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Peripheral arterial disease (PAD) of the lower limbs is an important predictor of cardiovascular disease. It is, however, still underdiagnosed in asymptomatic diabetic patients, free of cardiovascular disease. The purpose of this study is to determine the prevalence and risk factors for PAD in an asymptomatic population of diabetic patients at low, or intermediate, risk of cardiovascular disease, with a history free of cardiovascular disease.

Methods: This was a prospective study conducted over a 14-month period, from November 2017 - January 2018. A total of 309 diabetic patients were included from 2 diabetes centres. PAD was defined as an ankle-brachial index (ABI), less than 0.9.

Results: Amongst the 309 patients, the ankle-brachial index (ABI) was <0.9 in 98 (31.71%) patients who were considered to have PAD. The ABI was >1.3 in 36 (11.35%) patients who had suspected mediacalcosis. The average age of the PAD population was 56.2 years. Female gender predominated (57%). The mean duration of diabetes was 11 years, 80% type II diabetes. PAD of the lower limbs was mild in 26 patients (26.53%), moderate in 49 (50%) and severe in 23 (23.46%). Duplex Doppler commonly showed lesions of the femoral and tibial arteries. Factors associated with PAD were advanced age ($p<0.0001$), duration of diabetes >6 years ($p<0.0001$), uncontrolled diabetes as assessed by HbA1c levels >7% ($p<0.0001$), elevated fasting glucose levels ($p=0.039$), hypertension ($p<0.0001$) and dyslipidemia ($p<0.0001$). For mediacalcosis, male gender was the only factor identified.

Conclusion: Primary prevention outpatient screening of asymptomatic diabetic patients with lower, or intermediate, cardiovascular risk can identify numerous patients with PAD. Advanced age, mean duration of diabetes over 6 years, uncontrolled diabetes, hypertension and dyslipidemia were predictive factors for diabetic PAD of the lower limbs in our population.

Left ventricular diastolic dysfunction in normotensive non diabetic patients with abdominal obesity

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Abdominal obesity is an independent risk factor for cardiovascular disease. The effect of abdominal obesity on myocardial function in young obese patients remains unknown.

Methods: To assess the influence of obesity on left ventricular function, 50 obese asymptomatic patients [mean body mass index (BMI) 35.8 ± 4.2kg/m^2 and mean age 39.2 ± 2.4 years] without evidence of heart disease were evaluated by echocardiography.

Results: Results showed that diastolic dysfunction was present in 21 (42%) patients. Diastolic dysfunction was more common amongst females (68.18%) when compared to males (50.17%). The mean left ventricular mass index was 103 ± 22g/m^2.

Conclusion: In conclusion, diastolic dysfunction might be an early indicator of cardiac involvement in obesity.

Left ventricular diastolic dysfunction in type II diabetes mellitus with preserved systolic function: Prevalence and associated factors

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Doppler echocardiography has contributed significantly to identifying the existence of a distinct diabetic cardiomyopathy, independent of concomitant risk factors. The objective of our study was to evaluate the prevalence of diastolic dysfunction, and identify its associated factors, in type II diabetic patients in light of the 2016 recommendations of the American Society of Echocardiography.

Methods: A cross-sectional observational study, with a descriptive and analytic focus, was done over a 6-month period from July - December 2017. We studied 66 asymptomatic patients with type II diabetes mellitus without evidence of cardiovascular involvement, blood pressure less than 130/80mmHg and with a maximal treadmill exercise test showing no ischaemia. LVDD was evaluated by Doppler echocardiography.

Results: The mean age of our population, was 42 ± 9 years with extremes ranging from 39 - 84 years. A female predominance (68%) was noted with a sex ratio of 2.14. The prevalence of diastolic dysfunction was 27%. Factors associated with this change in diastolic function were advanced age ($p<0.0001$), duration of diabetes >10 years ($p<0.0001$), uncontrolled diabetes as assessed by HbA1c levels >7% ($p<0.0001$) and elevated fasting glucose levels ($p=0.039$), obesity ($p<0.0001$), dyslipidemia ($p<0.0001$) and menopause ($p=0.002$).

Conclusion: Diastolic dysfunction affects a significant percentage of patients with type II diabetes. Therefore, we propose strict glycaemic control in those subjects at-risk as well as early cardiographic echo screening to improve their management and to limit their progression to more serious complications.

Metabolic syndrome in hypertensive women

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Metabolic syndrome (MetS) is recognised as a cluster of cardiovascular risk factors. Appropriate treatment can reduce cardiovascular morbidity and mortality. However, cardiologists may not routinely diagnose MetS.

The aim of this study was to identify the prevalence of MetS amongst hypertensive women and to study the characteristics of this population.

Methods: We studied 248 hypertensive women, median age 61 years (range 18 - 86). Ten percent of them were diagnosed with MetS. A health questionnaire, including personal history of hypertension, diabetes mellitus (DM), smoking habits and medication, was completed for all participants. Waist circumference and blood pressure were measured and plasma glucose and a complete lipid profile were done.

Results: One hundred and twenty-two patients (49.19%) met the criteria for MetS. We divided our patients into 3 groups according to their age (<40, 40 - 65 and >65 years). No statistical significant difference was noted in the prevalence of MetS in these 3 groups (50.7, 43.6 and 53% respectively).

Concerning MetS related factors: increased waist circumference was by far the most common (86.88%). There was no significant difference in the prevalence of MetS in women with controlled or uncontrolled HTA.

One hundred and eight females from a possible 248 (43.54%) were diabetics. The majority (92, 85.18%) met the criteria for MetS.

Conclusion: Our results suggest that the prevalence of MetS dramatically increases amongst hypertensive women and that its prevalence is not influenced by age. Awareness should be raised amongst cardiologists as to the prevalence of MetS.

Hypertensive patients: Evaluation of a therapeutic education programme

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: Evaluation of a therapeutic education programme for hypertensive patients with personalised objectives which stretches over a 6-month period.

Methods: A prospective single-centre study, involving 106 patients, was conducted as follows: • Initial collection of epidemiological, clinical and paraclinical data from patients in normal consultation. • Each patient received a therapeutic personalised education session on how to use the hypertension follow-up notebooks developed by the work team. • The effectiveness of the education programme was monitored in 3 evaluation consultations over the 6 months of the survey.

Results: A total of 106 patients participated in the study: mean age 47 ± 10 years; 62.26% of them male (66 patients). Essential hypertension in 95.28% of patients, grade II to III, uncontrolled in approximately 70% of patients with an average evolution period of 9.5 ± 7.5 years.

At 6 months, a significant decrease in SAP (from 154 ± 3 - 143 ± 3mmHg, $p<0.01$) and DAP (from 95 ± 2 - 87 ± 2mmHg, $p<0.01$) was noted, 50.7% vs. 33.8% of patients have SAP and DAP in the therapeutic objectives. The monitoring of dietary and physical activity objectives is correlated with the decrease in BP ($p<0.05$). A significant increase in self-monitoring with therapeutic decision-making ($p<0.01$) was evident. A significant decrease in hypertension-related distress and feelings of failure ($p<0.01$) were noted. Success rate amongst patients who chose the objective reduce salt: 53%, reduce fat: 50%, walk several times/week (30 min): 88%, exercise at least once/week: 22% with 67% of participants having at least one physical activity objective in place. No significant decrease in weight (-0.6 ± 4.1kg) but 39% lost at least 2kg.

Conclusion: A therapeutic education programme, with personalised objectives, can yield significant results at 6 months in terms of BP, dietetics and physical activity, self-monitoring of hypertension whilst it can simultaneously lead to a reduction in feelings of distress.

Which factors could be associated with Iatrogenic adverse events related to Vitamin K Antagonist? Prospective survey of 150 patients

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: A major public healthcare problem exists regarding the use of vitamin K antagonists (VKA). Because of their narrow therapeutic index, they expose patients to 2 major risks: thrombosis and haemorrhage. These risks place VKA at the top of the list of iatrogenic risks.

Methods: We conducted a prospective survey over a 23-month period. All patients admitted to cardiology consultation, who had recently been placed on anticoagulation therapy using VKA, were included. A follow-up for a period of 1 year ± 3 months (thus 3 - 4 follow-up consultations) was done to detect adverse iatrogenic events related to health care practices of medical doctors and pharmacists and/or the behaviour of patients regarding their treatment.

Results: A total of 150 patients, treated with vitamin K antagonists, was included in the survey. Sixty-eight of the patients (45.33%) presented with: an iatrogenic haemorrhagic 38% (57 patients) or ischaemic event 7.33% (11 patients) during a follow-up period of 1 year ± 3 months. From amongst the 68 patients, 21 had a prescription of VKA that did not take into account their past medical history ($p=0.0003$). The prescription of an incorrect dose and/or administration frequency is more common in the group of patients that presented minimal haemorrhage ($p<0.0001$). The non-intervention of the pharmacist regarding medical indications, contra-indications and incorrect doses were observed in 72% of these patients with an iatrogenic incident ($p<0.0001$). Self-medication, aleatory VKA use, insufficient INR control and poor compliance to treatment are factors which increase the iatrogenic risk of vitamin K antagonists ($p<0.0001$).

Conclusion: The beneficial effects of vitamin K antagonist treatment rely on compliance to the prescriber's recommendations as well as biological testing follow-up, especially in the case of the elderly. Efficient intervention of pharmacists when dispensing the medication as well as thorough therapeutical management, facilitated by intensive education, are key.

Does any correlation exist between pulmonary hypertension severity and left ventricular diastolic function indices in hypertensive patients? Prospective study of about 150 hypertensive patients

Maryam Mouadili

CHU MED VI Marrakech Maroc, Marrakesh, Morocco

Introduction: An association between pulmonary hypertension and left ventricular diastolic dysfunction in hypertensive patients has been observed. However, the relation between the severity of pulmonary hypertension and different indices of diastolic dysfunction remains unclear. The objective of this study is to explore the relationship between the severity of pulmonary hypertension and different indices of LV diastolic dysfunction in hypertensive patients.

Methods: A total of 150 asymptomatic hypertensive patients were included in our study. Clinical history of all patients was recorded along with a clinical examination and echocardiography. LV dimensions, systolic and diastolic function and systolic pulmonary artery pressure (SPAP) were measured. We classified the patients into 2 groups according to presence, or absence, of diastolic dysfunction.

Results: Patients with diastolic dysfunction had significantly higher SPAP ($p<0.00001$) and significantly higher incidences of severe pulmonary hypertension ($p=0.034$). There was a significant positive correlation between SPAP and E/E' ratio ($r=0.354$, $p=0.00013$), and between SPAP and systolic blood pressure ($r=0.231$, $p=0.231$), and a significant negative correlation between SPAP and E/A ratio ($r=0.289$, $p=0.0019$), and between SPAP and E wave DT ($r=0.265$, $p=0.0047$). Independent predictors for the presence of severe pulmonary hypertension were E/E' >15, E/A <1, and E wave DT <60.

Conclusion: Hypertensive patients with diastolic dysfunction had a higher systolic pulmonary artery pressure and a higher incidence of severe pulmonary hypertension. Systolic pulmonary artery pressure showed a significant correlation with LV diastolic dysfunction indices.

Cardiac manifestations of congenital rubella syndrome

Davidzo Murigo-Shumba, Ebrahim Goolam Mahomed Hoosen, Andiswa Nzimela and Marelize Bosman

University of KwaZulu-Natal, Durban, KwaZulu-Natal, South Africa

Introduction: Maternal rubella infection in early pregnancy may result in Congenital Rubella Syndrome (CRS). Among the birth defects encountered with CRS are cardiac and eye malformations. CRS is a vaccine preventable condition. In South Africa, rubella containing vaccines (RCVs) are not included in the Expanded Programme of Immunisation (EPI). The objective of the study was to describe the characteristics of CRS patients with congenital heart defects (CHDs) at Inkosi Albert Luthuli Central Hospital (IALCH) over a 12-month period.

Methods: Hospital records of all patients with CHD and diagnosis of CRS from May 2018 - April 2019 were reviewed.

Results: Nine patients with CRS and a cardiac lesion were seen during the 12-month period. Two mothers reported a rash suggestive of rubella during early pregnancy. Findings at birth included prematurity (6 patients) and microcephaly (6 patients). Cardiac abnormalities included patent arterial duct in all patients. In addition, 3 had coarctation of the aorta, 2 had supravalvular pulmonary stenosis and 1 patient had a ventricular septal defect. Six patients underwent cardiac surgical intervention. Of the 3 who did not have cardiac surgery, 2 did not require surgery while the other patient succumbed to septic shock before surgery. Eye manifestations in 7 patients included: cataracts, microphthalmos, nanophthalmos and cornea opacification. Two patients demised, 1 before surgery and the other succumbed to ICU related complications post-surgery.

Conclusion: CRS remains a significant cause of morbidity and mortality in KwaZulu-Natal. Further studies are necessary as the introduction of RCVs to the EPI in South Africa, if feasible, could significantly reduce CRS cases.

Prevalence of rheumatic heart disease in Zambian school children

John Musuku

Ministry of Health, Lusaka, Zambia

Introduction: In recent years, following robust epidemiologic studies, the large global burden of rheumatic heart disease (RHD) has come to light. As an operational research component of a broader programme aimed at primary and secondary prevention of RHD, we sought to determine the current prevalence of RHD in the country's capital, Lusaka, using a modern imaging-based screening methodology. In addition, we evaluated the practicality of training local radiographers in echocardiography screening methods.

Methods: Utilising a previously validated, abbreviated screening protocol, echocardiography was conducted on a random sample of students in 15 schools. Through a task-shifting scheme, and in the spirit of capacity-building to enhance local diagnostic and research skills, general radiographers based at Lusaka University Teaching Hospital (UTH) were newly trained in the use of portable echocardiography devices. Students deemed screen-positive were referred for comprehensive echocardiography and clinical examination at UTH. Cardiac abnormalities were classified according to standard World Heart Federation criteria.

Results: Of 1 102 students who consented and were screened, 53 were referred for confirmatory echocardiography. Of these, 3 students had definite RHD, 10 had borderline RHD and 29 were normal. Eleven students were lost to follow-up. The rates of definite, borderline, and total RHD were 2.7 per 1 000, 9.1 per 1 000, and 11.8 per 1 000, respectively. Anterior mitral valve leaflet thickening and chordal thickening were the most common morphological defects. The pairwise kappa test showed good agreement between local radiographers and an echocardiographer quality assurance specialist.

Conclusion: The prevalence of asymptomatic RHD in urban communities in Zambia is on par with that reported in other sub-Saharan African countries. Task-shifting local radiographers to conduct echocardiography was feasible. The results of this study will be used to inform ongoing efforts in Zambia to control and eventually eliminate RHD.

Teachers' knowledge and attitudes regarding rheumatic heart disease

John Musuku

Ministry of Health, Lusaka, Zambia

Introduction: Rheumatic heart disease (RHD) is a major public health problem in Africa, affecting 1% - 5% of school-aged children. Community and school involvement is increasingly recognised as an essential component of national strategies to control RHD. Very little is however known about teachers' knowledge and attitudes about the disease. For the first time, school-based screening using portable echocardiography was conducted on up to 3 000 children in Lusaka.

Methods: A workshop was conducted for primary and secondary school teachers in February 2014. Participants also completed an 8-item multiple-choice questionnaire before, and after, the course to evaluate basic knowledge regarding RHD.

Results: Fifty-three teachers from more than 45 schools participated. Most were female and all but 3 had been teachers for at least 5 years. Approximately half of the teachers also served as their school's health officer. Only 55% had ever heard of RHD before the workshop, and 24% reported that they had known a student with RHD. Forty-nine percent of teachers were unaware that RHD is caused by bacterial infection of the throat and few (less than 25%) knew that children with RHD require regular antibiotics to prevent progression of their heart disease. Pre-post knowledge scores improved from 3.8/8 (SD 0.9) to 5.9/8 (SD 1.2; $p<0.001$). In the focus group discussion, teachers were overwhelmingly eager to help facilitate RHD screening programmes at their schools.

Conclusion: Teachers' baseline awareness of RHD is poor and few have first-hand exposure to students with RHD, despite the high prevalence of the disease in Africa. Notwithstanding, teachers were eager to learn about RHD and demonstrated significantly improved knowledge after the workshop. Teachers appear poised to assume their role as vital partners in school-based screening programmes and may also play important roles in long-term efforts to control RHD.

Coping, copeptin and cardiac stress: The SABPA study

Catharina Myburgh[*], Leoné Malan[*], Marisa Möller[#], Martin Magnusson[†], Olle Melander[‡], Henri Guise Laurie Rauch[◊], Faans Steyn[§] and Nicolaas Malan[*]

[*]Hypertension in Africa Research Team (HART), North-West University, Potchefstroom, South Africa. [#]Centre of Excellence for Pharmaceutical Sciences, School of Pharmacy, North-West University, Potchefstroom, South Africa. [†]Department of Clinical Sciences, Lund University, Clinical Research Centre, Malmö, Sweden. Department of Cardiology, Skåne University Hospital Malmö, Sweden; Wallenberg Centre for Molecular Medicine, Lund University, Malmö, Sweden. [‡]Department of Clinical Sciences, Malmö, Lund University, Malmö, Sweden. Department of Emergency and Internal Medicine, Skåne University Hospital, Malmö, Sweden. [◊]Division of Exercise Science and Sports Medicine, Department of Human Biology, Faculty of Health Sciences, University of Cape Town, Rondebosch, South Africa. [§]Statistical Consultation Services, North-West University, Potchefstroom, South Africa

Introduction: Defensive coping (DefS) is associated with a vulnerable cardiovascular profile in Blacks. The copeptin/vasopressin system is a manifestation of hypothalamic-pituitary-adrenal-axis (HPA-axis) activity and may act as an acute compensatory mechanism when there is a disruption in volume-loading homeostasis, i.e. when cardiac stress is evident. Whether DefS will influence associations between copeptin and cardiac stress markers, remains unclear. Our aim was to determine associations between acute mental stress responses of copeptin, vascular responsiveness and biomarkers of cardiomyocyte injury [cardiac troponin T (cTnT)] and cardiac wall-stress [N-terminal pro-brain natriuretic peptide (NT-proBNP)] in DefS race groups.

Methods: South African black and white teachers (n=378), of both sexes, participated in this target population study. Cases with a history of myocardial infarction, stroke and atrial fibrillation were excluded. We obtained coping scores (Coping Strategy Indicator), beat-to-beat blood pressure (stress-BP) and fasting blood samples at rest and after 1-minute exposure to the Stroop-Colour-Word-Conflict-test (Stroop-CWT).

Results: Interaction effects ($p<0.05$) for copeptin percentage change (%) during the Stroop-CWT determined stratification of participants into race and DefS (≥26, above-median score) groups. In DefS Blacks, Stroop-CWT exposure elicited increases in cTnT%, NT-proBNP%, diastolic-BP% and total peripheral resistance (TPR)%. Again, in these individuals, multiple regression analyses showed positive associations between copeptin% and TPR%; with inverse associations between copeptin% and cTnT% ($p<0.05$). None of these associations were found in DefS Whites.

Conclusion: DefS in Blacks elicited vascular hyper-responsiveness and cardiac wall-stress via the copeptin/vasopressin system. However, presumably hypo-responsive HPA-axis activity during stress exposure could not counteract coronary hypoperfusion via copeptin/vasopressin release. The presence of defensiveness may have clinical implications in preventive cardiology.

Personality, chronic defensive coping and S100B: New insights into the brain-heart link as per the SABPA prospective study

Catharina Myburgh and Leoné Malan

Hypertension in Africa Research Team (HART), North-West University, Potchefstroom, South Africa

Introduction: Certain personality traits can contribute to chronic ineffective coping and cardiac morbidity. Ineffective coping may influence astrocyte plasticity, followed by S100 calcium-binding protein B (S100B) release. High serum S100B levels have been associated with myocardial injury and remodelling. Therefore, we aim to investigate bi-ethnic gender associations between personality and longitudinal mean percentage differences (%Δ) in S100B, myocardial injury [cardiac troponin T (cTnT)], stress [N-terminal pro-brain natriuretic peptide (NT-proBNP)] and remodelling (R wave of the aVL lead) when chronically utilising a certain coping strategy.

Methods: South African black and white teachers (n=378), of both genders, were followed for 3 years. Cases with a history of myocardial infarction, stroke and left ventricular hypertrophy at baseline were excluded, as well as beta-blocker users and participants lost to follow-up. Coping (Coping Strategy Indicator) and personality (Basic Traits Inventory) scores were determined. Fasting serum samples for S100B, cTnT and NT-proBNP and 10-lead ECG recordings were obtained.

Results: Interaction effects ($p<0.05$) for personality traits determined stratification of participants into race, gender and defensive coping (DefS) (≥26, above-median score) groups. DefS black men scored lower in conscientiousness compared to DefS white men. In DefS black men, NT-proBNP increased significantly ($p<0.05$) over 3 years. In multiple regression analyses, %ΔS100B associated positively with %ΔNT-proBNP (adjusted R2=0.32, ß=0.26), but inversely with %ΔcTnT (adjusted R2=0.22, ß=-0.32) and %ΔRaVL (adjusted R2=0.16 ß=-0.33) in DefS black men only. Again in this cohort, 3 personality traits [conscientiousness (adjusted R2=0.22, ß=-0.25), openness to experience (adjusted R2=0.22, ß=-0.28) and agreeableness adjusted R2=0.22, ß=0.-0.30)] associated inversely with %ΔcTnT.

Conclusion: Ineffective DefS in black men appears to be driven by certain personality traits, posing as a risk for cardiac morbidity. Chronic defensiveness contributed to lasting high serum S100B levels. S100B may accelerate the progression of ischaemic heart disease in DefS black men, as it appears to inhibit left ventricular hypertrophy and increase myocardial stress.

Cost effectiveness analysis of new and prior generation transcatheter aortic valve replacement compared to surgical valve replacement in a South African context

Tiffany Naidoo[#], JanBenjamin Pietzsch[*], Angelica Oyuyi[#], Eline Visser[#], Beatrice Ceronio[#], Alaa Badarneh[#] and Willie Koen[†]

[*]Wing Tech Inc, Xuhui District, Shanghai, China. [#]Medtronic Africa, Midrand, Gauteng, South Africa. [‡]Netcare Christiaan Barnard Hospital, Cape Town, South Africa

Introduction: The cost of the transcatheter aortic valve implant (TAVI) procedure is assumed to be higher than surgical aortic valve replacement (SAVR) for private medical insurance in South Africa. Previous health economic research, conducted in 2014, showed TAVI to be cost-effective when compared to SAVR. Our objective was to estimate the cost-effectiveness of a contemporary self-expanding TAVI device in patients at high surgical risk in the South African healthcare system.

Methods: A previously developed decision-analytic Markov model, based on the CoreValve HR study, was used to estimate the lifetime gain in quality adjusted-life years (QALY) and lifetime incremental cost-effectiveness. Cost and resource utilisation for South Africa was derived from the SA SHARE-TAVI registry, hospital billing data, fee schedules and published literature. A scenario analysis based on second-generation self-expanding TAVI devices was conducted.

Results: Over the patient's lifetime, TAVI was projected to add 0.32 QALYs. Resource use in terms of hospital length of stay was found to be markedly lower for TAVI compared to SAVR (2.6 vs. 6.2 days ICU; 5.7 vs. 12.1 days total), offsetting the higher TAVI procedure costs. Total estimated costs were R51 434 higher in the TAVI strategy, leading to an approximated ICER of R161 236. Using second-generation devices reduced the cost difference to R41 954. These ICERs estimates suggest TAVI is cost effective relative to a SA willingness to pay threshold of ~R300 000/QALY.

Conclusion: Our analysis suggests TAVI using self-expandable devices in patients at high surgical risk is a cost-effective intervention in the South African healthcare system. The use of second-generation devices may further improve this favourable value proposition.

An investigation into the PCSK9 gene polymorphism E670G and the risk of coronary artery disease in the South African black population

Nitien Naran*, Sean-Michael Bhika#, Ruth Jali#, Nqoba Tsabedze† and Nigel Crowther*

*NHLS, Johannesburg, South Africa. #University of the Witwatersrand, Johannesburg, South Africa. †Division Of Cardiology, Department of Internal Medicine, Faculty of Health Sciences, Charlotte Maxeke Johannesburg Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Proprotein convertase, PCSK9, promotes LDL receptor (LDLR) degradation. Gain-of–function mutations in PCSK9 reduce LDLR expression, which decreases cellular uptake of LDL resulting in elevated serum LDL concentrations. The G allele of the E670G polymorphism in PCSK9 is associated with higher LDL levels and coronary artery disease (CAD). The G variant may increase the affinity of PCSK9 for LDLR. The prevalence of CAD is increasing in South Africa, however, no data exists on the disease-association of E670G in the local population. Therefore, our aim was to investigate the association of the E670G polymorphism with CAD in a South African black population.

Methods: African CAD cases (n=71) were recruited from the Charlotte Maxeke Johannesburg Academic Hospital cardiac clinic. A convenience sample of African control participants, with no history of CAD (n=111), was also recruited. Fasting serum lipid concentrations were measured using routine laboratory methods. Genotyping of the E670G polymorphism was performed using a standard RFLP-based PCR method.

Results: The percentage of subjects carrying the E670G GG or AG genotypes (G carriers) was higher in cases (69.0%) than controls (50.4%; p=0.01). When comparing G carriers to those with the AA genotype (non G carriers), there were no differences in LDL (p=0.62), total cholesterol (p=0.12) or HDL (p=0.49) levels but triglyceride levels were higher in the G carriers (p=0.003). Logistic regression demonstrated that G carriers had an odds ratio (with 95% CIs) for CAD of 2.19 (1.16, 4.11) (p=0.01) compared to non G carriers.

Conclusion: The G allele of the E670G polymorphism in the PCSK9 gene is associated with a greater than 2-fold risk of CAD in black African participants. It is possible that this effect is mediated by the modulation of lipid levels by PCSK9, however, this hypothesis can only be confirmed in cases where recent coronary events have not been treated with lipid-lowering agents.

An investigation of the prevalence of a lectin-like oxidised low density lipoprotein receptor: 1 (LOX-1) gene polymorphism (G501C) in patients with coronary artery disease in South Africa

Nitien Naran*, Gerrit Maasdorp*, Nqoba Tsabedze# and Nigel Crowther*

*NHLS, Johannesburg, South Africa. #Division Of Cardiology, Department of Internal Medicine, Faculty of Health Sciences, Charlotte Maxeke Johannesburg Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Coronary artery disease (CAD) is a multifactorial disorder. Epidemiological studies have shown that the incidence of CAD has been increasing markedly in developing countries. Several studies have attempted to identify candidate genes that may be associated with CAD. One such gene is the oxidised low-density lipoprotein receptor-1 (LOX-1) gene. This receptor is responsible for the binding, internalisation and degradation of ox-LDL in endothelial cells. A single nucleotide polymorphism (G501C) of the LOX-1 gene results in a non-conservative amino acid dimorphism (Lys/Asn) and studies have shown a lower frequency of the C allele (CC/GC) in patients having CAD. As yet, there is no data on the LOX-1 G501C gene polymorphism in the South African population. Therefore, the aim of this study was to investigate the prevalence of different G501C genotypes in CAD patients and controls in a black South African population.

Methods: A total of 47 patients with confirmed CAD were recruited from a local cardiac clinic and 39 control subjects with no history of heart disease were recruited by convenience sampling. Anthropometric data were measured and venous blood samples collected for serum lipid profile. Venous blood in EDTA was collected for DNA extraction and RFLP-based PCR was used to determine the LOX-1 G501C genotypes.

Results: There was a lower frequency of C allele carriers i.e. CC or GC in CAD (40.4%) than non-CAD (51.3%) subjects, but this association did not reach statistical significance (p=0.319). In addition, C allele carriers tended to have lower serum LDL cholesterol levels than those with the GG genotype [median (interquartile range): 2.35 (1.73, 3.56) vs. 2.73 (2.29, 3.52) mmol/L; p=0.086].

Conclusion: The C allele is associated with a lower prevalence of CAD and a less atherogenic lipid profile. However, these differences did not reach statistical significance and must be confirmed using a larger sample size.

Initiating the first rheumatic heart disease clinic for children and adolescents in Cameroon

Yanwou Nguemnang Nathan Yves and Njedock Nelson

Faculty of Medicine and Biomedical Sciences, University of Yaounde, Yaounde, Cameroon

Introduction: Rheumatic heart disease (RHD) remains the major cause of heart failure, stroke and death among African children. Secondary prophylaxis is a key solution to slow disease progression. A pilot RHD clinic was established in Yaoundé, Cameroon, to increase the adherence to secondary prophylaxis and build a prospective registry to facilitate a follow-up amenable to the assessment of outcomes.
Methods: The echocardiography registers of 2 centres were accessed. Children diagnosed with RHD, between 2015 and 2018, were contacted and invited to the launch of the RHD clinic. Sociodemographic and clinical data were collected progressively for the registry during a monthly appointment.
Results: From the 1 200 patients included in the echo registers, 70 had confirmed RHD. Overall, 23 patients were included in the registry, 16 patients were female, the mean age at diagnosis was 11.2 years (4 - 23) and 87% lived in urban Yaoundé. Adherence to secondary prophylaxis increased from 31% at the beginning to 86% at 6 months. Two patients had severe lesions which required surgery. No patient was completely assessed for complications.
Conclusion: Adherence to secondary prophylaxis for patients suffering from RHD is very challenging. A close follow-up and patient education programme is important to achieve adequate adherence. Resources are needed to build sustainable and complete registers.

Simplifying the screening of hypertension in Cameroonian children and adolescents using blood pressure to height ratio

Yanwou Nguemnang Nathan Yves

Faculty of Medicine and Biomedical Sciences, University of Yaounde, Yaounde, Cameroon

Introduction: The diagnosis of arterial hypertension in children is complex due to constraints regarding time needed to use the recommended tools. Simpler methods are thus necessary.
Methods: This study aimed to evaluate the performance of a new tool, the blood pressure to height ratio, in the diagnosis of hypertension in a paediatric group. From November 2017 - April 2018, school aged children in Yaoundé were recruited in the study. Height and blood pressure were measured according to international recommendations. SBPHR and DBPHR were calculated. The sensitivity, specificity and precision of threshold identifying prehypertension and hypertension in children and adolescents were evaluated using the ROC curves. The level of statistical significance was set at 95%.
Results: A total of 1 239 children and adolescents were enrolled in this study. Adolescents (58.9%) and female sex (61.9%) were most represented. Cut-off values of BPHR/DBPHR for the diagnosis of prehypertension and hypertension were 0.77/0.52 and 0.81/0.53 in children aged 6 - 11 years, while it was 0.72/0.40 and 0.76/0.45 in adolescence aged 12 - 17 years, respectively. The areas under the cut-off curve for the diagnosis of hypertension were all greater than 0.9. Specificity and sensitivity of threshold were greater than 97%, but negative predictive value was poor, ranging from 0.5% - 2.5%.
Conclusion: Blood pressure to height ratio is an effective, readily available and simple tool to use in the screening of hypertension and pre-hypertension in children. Though it may not substitute the gold standard in term of diagnosis, it remains a reliable screening tool.

The management of pulmonary embolism at the cardiology department of Grand Yoff General Hospital in Dakar, Senegal: Cross-sectional study of 61 cases

Aliou Alassane Ngaide[*], Maimouna Sow[#], Ngoné Diaba Gaye[†], Momar Dioum[‡], Fatou Aw[#], Sérigne Mor Beye[§], Salimatou Dela Diallo[§], Cheikh Gaye[§], Khadidiatou Gueye[§] and Alassane Mbaye[§]

[*]University Cheikh Anta DIOP of Dakar, Senegal. [#]Hospital Aristide Le Dantec, Dakar, Senegal. [†]Institute of Medico-Social Foresight Hospital, Dakar, Senegal. [‡]FANN National Hospital, Dakar, Senegal. [◊]Regional Hospital of Saint Louis General Hospital, Dakar, Senegal. [§]General Hospital of Grand Yoff, Dakar, Senegal

Introduction: Pulmonary embolism is a serious, life-threatening condition. Once considered rare in Africa, it is becoming increasingly frequent. We aim to evaluate the aetiological, therapeutic and prognostic factors of pulmonary embolism in a cardiology department in Dakar, Senegal.
Methodology: This is a retrospective and descriptive study conducted from 1 January 2010 - 31 December 2015 at the cardiology department of the General Hospital of Grand Yoff amongst patients admitted for pulmonary embolism confirmed with CT angiography.
Results: Sixty-one (61) cases of pulmonary embolism were recorded (1.7%) with a sex ratio of 0.30 and an average age of 54.85 ± 17.01 years. Aetiologies were dominated by medical factors (age over 60, diabetes, smoking and phlebitis) with 70.5% of cases, gynaecological or obstetric factors

(13.1%) and surgical or orthopaedic factors (16.4%). Pulmonary embolism was bilateral in 39 cases and unilateral in other cases. Echocardiography showed dilation of the right ventricle in 34 patients and pulmonary hypertension in 29. Pulmonary embolism was at high risk of premature death in 9 cases (14.75%), at intermediate risk in 32 cases (52.45%) and at low risk in 20 cases (32.78%). All patients were treated with anticoagulants and 7 with thrombolysis following a cardiovascular collapse. NOACs were prescribed because of the very high cost. Five patients died, 2 of the 9 cases of high-risk pulmonary embolism (22.2%) and 3 of 53 cases (5.8%) who were not considered at high risk (p=0.037).

Conclusion: Our study shows the prevalence of pulmonary embolism in women. Aetiological factors are essentially medical. The prognostical risk of premature death is often intermediate, or low, but mortality is significantly higher in high-risk patients. The anticoagulant treatment is still based on the anti-vitamin K.

Management and aetiological profile of heart failure in a general cardiology service in Senegal: Cross-sectional descriptive study of about 103 cases

Aliou Alassane Ngaide*, Maimouna Sow#, Ngoné Diaba Gaye†, Momar Dioum‡, Fatou Aw#, Sérigne Mor Beye§, Salimatou Dela Diallo§, Cheikh Gaye§, Simon Antoine Sarr#, Mouhamed Haris§ and Alassane Mbaye§

*University Cheikh Anta DIOP of Dakar/General Hospital of Grand Yoff. #Hospital Aristide Le Dantec, Dakar, Senegal. †Institute of Medico-Social Foresight Hospital, Dakar, Senegal. ‡FANN National Hospital, Dakar, Senegal. ◊Regional Hospital of Saint Louis General Hospital, Dakar, Senegal. §General Hospital of Grand Yoff, Dakar, Senegal

Objectives: The aim of this study was to evaluate management and the aetiological profile of heart failure in a cardiology department in Dakar, Senegal.

Methodology: A cross-sectional study was conducted at Grand Yoff General Hospital from 1 June - 30 September. Patients aged 15 years or younger hospitalised for heart failure were included. Heart failure was defined by the presence of symptoms and clinical signs (dyspnea, distension of jugular vena, hepatomegaly, oedema of the lower limbs, rales) and confirmed by echocardiography. Heart failure was divided in 3 categories: heart failure with reduced ejection fraction (less than 40%), heart failure with preserved ejection fraction (normal >50%) and intermediate ejection fraction (between 40% - 49%). Diagnosis of ischaemic heart disease was based on proven coronary history and/or segmental contraction abnormalities on echocardiography. Data were analysed with Sphinx V.5 software.

Results: A total of 103 patients, hospitalised for heart failure, were enrolled. Mean age was 58.92 years. Sex ratio M/F was 1.02. Most common cardiovascular risk factors were age (65.05%) and hypertension (46.6%). Left ventricular ejection fraction was reduced in 48% of patients. Most frequent aetiologies were dilated cardiomyopathy (35%) and ischaemic cardiomyopathy (27,2%). In the acute phase, 72% of patients were hospitalised in intensive care units in cardiology and the prescription consisted mainly of loop diuretics (92.2%), spironolactone (59.2%) and angiotensin conversion enzyme inhibitors (61.2%). At discharge, spironolactone was prescribed in 60.2% of cases, thiazidic diuretics in 28.2%, ACE inhibitors in 48.50% and beta-blockers in 33%.

Conclusion: Heart failure, with reduced ejection fraction, was most common in our population. Dilated and ischaemic cardiomyopathies were the most frequent aetiologies.

Incidence of sport-related sudden cardiac arrest in non-competitive athletes over 12 years of age in an African general population: The DOUALA-SCD registry

Marcus Ngantcha*, G. Tchanana#, S. Tchameni#, J.L. Ngo#, S. Mbouh†, A. Suliman‡, A. Bonny◊

*Cameroon Cardiovascular Research Network, Douala, Cameroon. #Université Catholique d'Afrique Centrale, Yaoundé, Cameroon. †Institut National de la Jeunesse et des Sports, Yaoundé, Cameroon. ‡Department of Internal Medicine, University of Khartoum, Sudan. ◊District Hospital of Bonassama-University of Douala, Douala, Cameroon

Introduction: The incidence of sport-related sudden cardiac arrest (SrSCA) in sub-Saharan Africa is unknown. The objective of this study was to determine the incidence of sudden cardiac arrest in non-competitive athletes in an urban population in Cameroon.

Methods: Two sources of information were used. A 12-month multi-source surveillance system of 86 189 inhabitants over 12 years old from 2 districts recorded all deaths. All sport fields, the emergency medical service (EMS), local medical examiners and the district hospital mortuaries were surveyed. Two cardiologists, blinded to each other, used a verbal autopsy protocol to determine the cause of death. The physical activity of the victim during the last 3 hours before death was recorded. The second source was to determine the proportion of people which had practiced a physical activity. This was determined by a cross-sectional study conducted amongst 796 persons.

Results: The cross-sectional study showed that 68.71% could be considered as having at least 3 hours of physical activity per week. The surveillance found that among 288 all-cause deaths, 27 (9.4%) were due to sudden cardiac arrest (SCA). One SrSCA was registered in a 35-year-old female while

running. When both sources were merged an incidence of SrSCA of 1.7 (95% CI 0.2 - 12.0) cases per 100 000 athletes per year were revealed. The average incidence in the United States, however, is estimated to be 2.17 (95% CI 0.81 - 3.54) per 100 000 athletes per year.

Conclusion: SrSCA in this sub-Saharan population appears comparable to that in western countries. A nationwide extension of this urban study will provide further insights into the real SrSCA burden in Africa.

Cardiac arrhythmia services in 22 African countries from 2011 - 2018: The second report of the Pan African Society of Cardiology (PASCAR)

Marcus Ngantcha[*], K. Karaye[#], W. Scholtz[†], J. Russel[‡], M. Houenassi[◊], A. Niakara[§], Y. Lubenga[Δ], M. Diakite[+], A. Moustaghfir[**], A. Damasceno[∞] and E. Okello[ʃ]

[*]Cameroon Cardiovascular Research Network, Douala, Cameroon. [#]Aminu Kano Teaching Hospital, Kano, Nigeria. [†]PASCAR, Department of Medicine Faculty of Health Sciences, University of Cape Town, Rondebosch, South Africa. [‡]University Teaching Hospital of Freetown, Freetown, Sierra Leone. [◊]University Teaching Hospital of Cotonou, Cotonou, Benin. [§]University Teaching Hospital Yalgado, Ouagadougou, Burkina Faso. [Δ]University of Kinshasa, Kinshasa, Democratic Republic of the Congo. [+]CHU Gabriel Toure, Bamako, Mali. [**]Hassan II University, Casablanca, Morocco. [∞]Eduardo Mondlane University, Maputo, Mozambique. [ʃ]Uganda Heart Institute, Kampala, Uganda

Introduction: The aim of this study is to provide comprehensive information regarding the access and use of cardiac arrhythmia treatments in Africa from 2011 to 2018.

Methods: Member countries of the Pan-African Society of Cardiology (PASCAR) collected data on human resources, drug availability, cardiac implantable electronic devices (CIED) and ablation procedures. Information on health care systems, demographics, economics and procedure rates were also collected.

Results: Twenty-two responses from more than 31 cardiologists from different countries were received. Considerable heterogeneity in the access to arrhythmia care was observed. Non-VKA oral anticoagulants (NOACs) were only available in some countries: rivaroxaban (76%), dabigatran (29%) and apixaban (23%). Digoxin and amiodarone were available in all countries, flecainide (76%), sotalol (71%), propafenone (21%) and quinidine (14%) followed. Four countries (18%) did not perform pacemaker implantations, unless facilitated by humanitarian programmes (23%). In 2016, the median pacemaker implantation rate was 2.866 per million population per country (range: 0.000 - 291.790) which is 200-fold less than in western countries. In 2018, there were 0.144 operators per million population per country. ICD and cardiac re-synchronisation were performed in 11 (50%) and 14 (63%) countries, respectively. Reconditioned CIED were used in only 7 (32%) countries. Catheter ablations were available in 9 (41%) countries. Marked variation in cost (up to 1 000-fold) was observed across countries with an inverse correlation (-0.48) between implant rates and the procedure fees standardised to the gross domestic product per capita.

Conclusion: Access to invasive cardiac arrhythmia procedures in Africa was limited. Drug therapies remained a big challenge. Pacemakers were not available in some sub-Saharan countries. Owing to the high cost of device implantation, more than 200 million people did not have access to the treatment of life-threatening heart blocks. Lack of economic resources and facilities as well as a scarcity of trained physicians were the other main drivers of poor cardiac arrhythmia services.

Optimising fibrin as a scaffold for regenerative medicine

Silindile Ngcobo, Deon Bezuidenhout and Neil Davies

University of Cape Town, Rondebosch, South Africa

Introduction: Fibrinogen is an attractive candidate for regenerative medicine due to its inherent bioactivity and FDA approval. In this study we sought to modify fibrinogen through covalent attachment of heparin, for growth factor delivery. Heparin binds a significant number of growth factors and its anti-coagulative characteristic plays a role in minimising thrombotic events.

Methods: Fibrinogen was conjugated to NHS-PEG-SH through NHS ester reaction chemistry. After dialysis, bound thiols were quantified with a maleimide fluorescent assay. Acrylate heparin was conjugated to thiols through Michael-type reaction, forming Fibrinogen-PEG(FP)-Heparin (FPH). The FPH was dialysed and bound heparin quantified with heparin red and MBTH assays. Subsequently, FPH was polymerised with thrombin and characterised using rheology for viscoelastic properties and scanning electron microscopy for microstructure. Growth factor entrapment and release were assayed with ELISAs. The gel was further assessed in vitro with a 3D endothelial cell spheroid angiogenesis assay.

Results: Binding of 1 heparin molecule in 3 fibrinogens was achieved. Frequency sweeps at 1Hz showed reduced mechanical stiffness for FPH (23 ± 5.3Pa) compared to normal fibrin (50 ± 4.5Pa) but degraded slower. The FPH reduced VEGF burst release and bound 67 ± 1.2%, compared to 42 ± 6.9% fibrin and 46 ± 8.0% FP. By day 3, fibrin and FP released more than 90 ± 5.7% of bound VEGF whilst FPH continued to release an average of

8.58 ± 0.05ng/day with 41 ± 5.1% still bound by 11 days. In vitro, spheroids viability was maintained post encapsulation with significant invasion. From thromboelastograms, FPH inhibited coagulation in blood.

Conclusion: To our knowledge, this is the first study to conjugate heparin to fibrinogen in this manner, forming anti-thrombotic fibrin with enhanced growth factor binding. This offers a natural and convenient delivery vehicle, mimicking the extracellular matrix. The gel will be evaluated in vivo for neovascularisation.

A case of severe tricuspid regurgitation due to traumatic tricuspid valve papillary muscle rupture

Bongane Ngutshane*, Shungu Mogaladi# and Ruchika Meel†

*Gauteng Department of Health, Johannesburg, South Africa. #Charlotte Maxeke Johannesburg Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa. †Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: There have been at least 160 published case reports pertaining to the subject of traumatic tricuspid valve injury since the 1960s. These reports emanated from different parts of the world, however, reports from Africa have been scarce. Herein, we report in detail a case of trauma related tricuspid valve insufficiency from South Africa. Further, we highlight the importance of 2 and 3 dimensional (3D) echocardiographic imaging of the tricuspid valve and its utility in aiding a successful surgical repair.

Methods: A case of a patient with suspected tricuspid valve papillary muscle rupture is described with the aid of 2 and 3D echocardiographic imaging. Further, a successful tricuspid valve repair is reported.

Results: A 25-year-old male with no co-morbidities presented to a peripheral hospital emergency unit after having sustained a blunt chest trauma in a motor vehicle accident (MVA). On admission he was assessed to have soft tissue injury and a haemo-pneumothorax for which an intercostal drain was inserted. He was referred for a routine echocardiogram 3 weeks post MVA. The patient was asymptomatic with a soft tricuspid regurgitation murmur in the tricuspid area and prominent V waves in the jugular venous pulsation. On echocardiography, severe tricuspid regurgitation (TR) secondary to possible papillary muscle rupture was noted. A subsequent trans-oesophageal 3D echocardiographic imaging study confirmed a flail anterior tricuspid valve leaflet secondary to papillary muscle rupture as the mechanism of severe TR. The patient was referred for urgent surgery and underwent a successful tricuspid valve repair. He continues to do well on follow-up.

Conclusion: This case highlights and reinforces the value of routine echocardiography post-traumatic injury. Further 3D imaging enabled a comprehensive assessment of the tricuspid valve anatomy prior to surgery.

From national plan to local action in fighting hypertension: Situational analysis to strengthen primary healthcare in low-income high-burden urban communities in Senegal

Cheikh Niang†, Mouhamadoul Mounir Dia#, Jose Maria Ferrer*, Mouhamadoul Mounir Dia#, Joseph Silva Barboza†, Karim Seck‡, Elhadji Babacar Gueye†, Sujata Bijou†, Roberta Bosurgi‡, Melanie Joiner†, Lakshmi Venkitachalam* and Jason Shellaby‡

*American Heart Association, Dallas, Texas, United States of America. #Centre Médico-social de la Fonction Publique, Dakar, Senegal. †IntraHealth International, North Carolina, United States of America. ‡Novartis Foundation, Johannesburg, South Africa

Introduction: In Senegal, CVDs cause 17% of deaths. Thirty percent of adults have hypertension, of these: 46% are aware of their condition, 17% are under treatment and 8% have controlled BP. In 2017, we initiated a multi-sector programme to support the MOH's first national operational plan on CVDs starting with a situational analysis on hypertension care in the capital, Dakar.

Methods: Between October 2017 and July 2018, we conducted a cross-sectional study of 3 health districts in Dakar evaluating: availability of hypertension services, hypertension knowledge, attitudes and practices of healthcare providers and knowledge of patients. Data were collected using a facility inventory, questionnaire and interview guide. Overall, we surveyed 52 facilities covering a population of 1 121 924.

Results: All health facilities in the 3 districts had functional consultation rooms but only 10% had dedicated spaces for CVD or hypertension management. The number of blood pressure monitors, ECG machines and medical laboratories was insufficient given the growing number of patients. None of the facilities had posters, standardised algorithms or tools such as patient records or registries to ensure adequate hypertension management. Of the 443 healthcare providers interviewed, only 60% had been trained regarding effective hypertension care, 55% were aware of the concept of cardiovascular risk and 65% knew how to measure blood pressure properly. This demonstrated a clear need to retrain providers with the latest guidelines. Of the 1 546 patients interviewed, only 21% knew at least 3 signs of hypertension, 21% were hypertensive of whom only 18% were aware of at least 3 risk factors for hypertension. This showed a lack of patient understanding and a pressing need for better health education.

Conclusion: This situational analysis highlighted gaps in hypertension management in Dakar's primary healthcare system. These findings form the basis of an ongoing educational process and clinical interventions designed to improve quality of care and reduce related morbidity and mortality.

Hot and cold water extracts of Panaeolus Cyanescens Magic Mushroom display dissimilar properties on arginase activity in endothelial cells

Sanah Nkadimeng*, Chris Steinmann# and Jakobus Eloff

*University of Pretoria, Pretoria, South Africa. #Sefako Makgatho Health Sciences University, Ga-Rankuwa, Pretoria, South Africa

Introduction: Increased arginase activity has been implicated in various conditions characterised by impaired endothelial dysfunctions, including pulmonary hypertension. Arginase competes with nitric oxide synthase (NOS) for intracellular L-arginine substrate and, as a result, contributes to reductions in endothelial nitric oxide generation, promotes reactive oxygen species production and endothelial NOS uncoupling. Panaeolus cyanescens (P. cyan) is a potent psilocybin mushroom in the Panaeolus genus which grows in different countries, including South Africa. Psilocybin and psilocybin mushrooms have been found to possess antidepressant effects with a temporary increase in blood pressure (BP) of which the mechanisms are unknown. We hypothesised that P. cyan increases BP by mechanisms that involve arginase activity pathways in endothelial cells.

Methods: The mushrooms were oven dried and extracted with cold and hot water. Antioxidant activity was measured with 1.1-Diphenyl-2-picrylhydrazyl and 2.2'-azino-bis (3-ethyl-benzothiazoline-6 sulfonic acid) diammonium salt assays. The P. cyan extracts were tested for cytotoxicity using the tetrazolium bromide assay on bovine pulmonary aortic endothelial cells (BPAEC). When grown to confluence, BPAEC cells were induced with stress and then treated with the 3 extracts (50 and100µg/mL) over 48 hours with and without Nw-nitro-L-arginine methyl ester (NOS inhitor), S-(2-Boronoethyl)-L-cysteine hydrochloride (arginase inhibitor) and L-arginine supplement. Apoptosis, mitochondrial activity, nitric oxide production and arginase activity was measured using caspase 3, resazurin, nitrite and arginase activity assay kits.

Results: Results showed that P. cyan mushroom extracts have poor antioxidant activity. The results also showed that stress induced cells had lower mitochondrial activity as well as higher caspase 3 and arginase activities than the normal cells.

Conclusion: The results suggested that P. cyan, extracted with hot water, is safer and has beneficial arginase-downregulation effects. However, the results also suggested that the cold-water extracts of P. cyan have upregulating-arginase activity which may promote BP increase. Caution needs to be exercised, especially when consumed by individuals who suffer from conditions such as hypertension.

Effectiveness and tolerability of Perindopril plus Amlodipine single pill combination (with or without diuretics) in Nigeria: The 13-City hypertension study

Dike Ojji*,∞, Victor Ansa#, Mahmoud Sani†, Austine Obasahan‡, Sola Alagbe◊, Rotimi Williams§, Tony Aknitomide△, Innocent Okoye+, Eze Nwafor**, Lamkur Shedul∞ and Raphael Anakwe[]

*University of Abuja, Abuja, Nigeria. #University of Calabar Teaching Hospital, Calabar, Nigeria. †Aminu Kano Teaching Hospital, Kano, Nigeria. ‡University of Benin Teaching Hospital, Benin-City, Nigeria. ◊General Hospital, Lagos Island, Lagos, Nigeria. §MITEDA Hospital, Akure, Nigeria. △Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria. +Chukwu Emeka Odumegwu Ojukwu University Teaching Hospital, Nnewi, Nigeria. **University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria. ∞University of Abuja Teaching Hospital, Abuja, Nigeria. []University of Nigeria Teaching Hospital, Enugu, Nigeria

Introduction: Although the benefits of antihypertensive combination therapy, including single pill combinations (SPCs) like Perindopril plus Amlodipine, are well known, efficacious combinations for the black African population are a subject of debate and large population efficacy studies using contemporary antihypertensive combinations are still missing in this population group. We therefore decided to evaluate the blood pressure (BP) lowering efficacy and tolerability of Perindopril plus Amlodipine SPC in black African patients residing in Nigeria.

Methods: The 13-City Hypertension Study was a multicentre, prospective, observational programme amongst hypertensive patients with 4-week, 8-week and 12-week follow-up using Perindopril plus Amlodipine existing doses 10/10, 5/10, 10/5 and 5/5mg prescribed in accordance with local prescribing information. The effectiveness of treatment was assessed as the change from baseline in mean sitting systolic and diastolic BP and the proportion of patients achieving the therapeutic goal of BP less than 140/90mmHg. Safety and tolerability of this combination were also assessed.

Results: The mean age of the 937 patients analysed was 57.1 years and 51.7% were female, 812 (86.7%), 654 (69.8%) and 345 (36.8%) of the patients were followed up at 4, 8 and 12 weeks respectively. Systolic BP was significantly reduced by 17.2mmHg, 22.0mmHg and 21.5mmHg at 4, 8 and 12 weeks respectively compared to baseline value ($p<0.0001$ week 4, 8, 12 vs. baseline), while diastolic BP was significantly reduced by 9.3mmHg, 10.5mmHg and 12.4mmHg at 4, 8 and 12 weeks, respectively. Overall, 9.5% of the study population were placed on thiazide or thiazide-like diuretic. Side effects were reported in 1.9% of patients, with a dry cough in 0.64% being the commonest and angioedema in a single patient.

Conclusion: The 13-City Hypertension Study has shown that Perindopril plus Amlodipine SPC provided clinically meaningful reductions in BP and that it was well tolerated in a black African population.

Assessing the impact of switching to the tobacco heating system on cardiovascular events: Translating basic science into clinical benefit

Calin Pater, Nicolas Blanc, Angela van der Plas, Christelle Haziza, Ashraf Elamin, Sandrine Pouly, Guillaume de la Bourdonnaye, Cam Tuan Tran and Frank Luedicke

Philip Morris International, Biomedical Research and Development, Neuchatel, Switzerland

Introduction: Cigarette smoke (CS) is causally linked to the development of cardiovascular disease (CVD). Tobacco harm reduction, by substituting cigarettes with less harmful products, is a complementary approach to current strategies for smokers who would otherwise continue to smoke. The Tobacco Heating System (THS) 2.2 is a novel tobacco product that heats tobacco, instead of burning it, never allowing the temperature to exceed 350°C. The combustion process is thereby prevented from taking place and this produces substantially lower levels of toxicants compared with CS.

Methods: Philip Morris International's (PMI) pre-clinical and clinical assessment programme aims to demonstrate that switching to THS has the potential to reduce the risk of smoking-related diseases vs. continued smoking.

Results: The results of the THS assessment programme demonstrated positive cardiovascular effects in both in vitro, in vivo, as well as in clinical assessments. Since the start of THS commercialisation in November 2014, and cumulatively up to the end of 2018, 11 cases of MI and 5 cases of ischaemic stroke were reported by users. In most of these cases, no information was provided about the smoking history or the time of switching to THS, which makes it difficult to assess the causal relationship from a medical point of view.

Conclusion: The evidence available to date indicates that switching to THS has the potential to reduce the risk of smoking-related diseases, such as CVD. As a next step, PMI will complement its THS assessment programme with cardiovascular outcome studies intended to further support the clinical benefits of switching to THS compared to continuous smoking. Biomarkers linked to the development of smoking-related disease were analysed following a 6-month randomised, controlled clinical study with THS, which demonstrated a consistent improvement in these.

The RHD Action Small Grants programme: Small investment, big return!

Susan Perkins[*], Alastair White[#] and Jeremiah Mwangi[†]

[*]University of Cape Town, Rondebosch, South Africa. [#]World Heart Federation, Geneva, Switzerland. [†]Reach, Geneva, Switzerland

Introduction: Rheumatic Heart Disease (RHD) remains endemic in low- and middle-income countries (LMICs), despite its virtual elimination in high-income countries. RHD Action was launched to amplify global efforts to control RHD in 2015 by the World Heart Federation and Reach, with demonstration projects in Uganda and Tanzania as well as support from the Medtronic Foundation. The Small Grants Programme focuses on 3 domains: people and communities, medicines and technologies and systems and services. It is designed to support patient and community groups in promoting awareness and to advocate and build health workers' capacity to prevent and treat RHD in LMICs.

Methods: Requests for proposals were issued through RHD Action, PASCAR and WHF email distribution lists and cross-promoted on websites. A review panel with representation from Reach, WHF and demonstration projects used structured criteria for scoring based on clear, feasible, measurable objectives. Preference was given to proposals with dissemination plans using local publicity and social platforms, and for garnering support from local MOH officials. Final selections were approved by the Medtronic Foundation. Funding increased from $2 000 to $2 500 after the first round.

Results: Initiated in 2017, 13 proposals have been funded from a pool of 60 submissions. Recipient countries include Zambia, Uganda, Namibia, Rwanda, Mozambique, Cameroon, Fiji, the Philippines and Nepal. Project directors are primarily junior doctors and project managers supervised by senior mentors. In most cases, this is their first funding award. These projects have demonstrated tangible impacts and have provided content for first manuscript and abstract submissions and presentations at professional conferences. Grant reports are presented as website stories showcasing the achievements of small local efforts with meaningful impact.

Conclusion: For RHD Action, there is a large return on a modest monetary investment resulting in a very visible, viable global RHD networking platform for enthusiastic community and provider activists.

Clinical and angiographic impact of smoking on the prognosis of STEMI: Cathlab experience of UH of Casablanca

Zakaria Qechchar*, Fatima Ezzahra Talhi#, Monia El Mourid#, Salim Arous#, Mohamed Elghali Benouna#, Abdennaser Drighil#, Leila Azzouzi# and Rachida Habbal#

*Ibn Rochd University Hospital, Casablanca, Morocco. #Ibn Rochd University Hospital, Cardiology Department, Casablanca, Morocco

Introduction: Smoking is a known risk factor for coronary artery disease and is associated with increased rates of myocardial infarction and cardiovascular death. However, some data show lower mortality in smokers than non-smokers in patients with ST-elevation myocardial infarction (STEMI). The aim of this study is to evaluate the influence of smoking on clinical outcomes and its impact on mortality in patients admitted for STEMI.
Methods: A prospective study between October 2017 and April 2018 included a total of 98 patients. They were divided into 2 groups, based on smoking status during the STEMI presentation, namely active smokers (47 patients, 36%) and non-smokers (51 patients, 64%). The cathlab is closed at night and on weekends due to a lack of suitable staff in the catheter room. All STEMIs received lysis with tenecteplase and were prepared for angiographic exploration the following day. After discharge all patients were followed up for 12 months in consultation.
Results: Mean age was 52 ± 6 years, 68% of smokers were below 60 years old, sex ratio m/f to 4, history of myocardial infarction ($p=0.042$) and coronary angioplasty ($p<0.05$) were significantly associated with smoking. At admission, 87% of all STEMI smokers were treated with thrombolysis compared to 37% in the non-smoker group ($p<0.05$). The mean ejection fraction was 47% in the non-smoking group compared to 43% in the other group. Rhythmic complications were significantly greater in the non-smoking group. Biological markers of myocardial infarction were significantly higher in smokers. Angiographic comparative study showed more single vessel disease in patients who smoked ($p=0.015$) and double and triple vessel disease in the non-smoker group ($p=0.037$). One-year mortality was significantly higher amongst smokers (12.8%) than 6% in the non-smokers group ($p=0.003$).
Conclusion: Smokers admitted for STEMI are younger and have a higher mortality rate at 1 year when compared to non-smokers. These results highlight the role of efforts to encourage smoking cessation in the primary prevention of myocardial infarction.

Variability of renal function and impact on mitral regurgitation in the elderly

Zakaria Qechchar*, Fatima Ezzahra Talhi#, Monia El Mourid#, Abdenasser Drighil#, Leila Azzouzi# and Rachida Habbal#

*Ibn Rochd University Hospital, Casablanca, Morocco. #Ibn Rochd University Hospital, Cardiology Department, Casablanca, Morocco

Introduction: Despite improvement in diagnosis and management, mitral regurgitation (MR) remains associated with high morbidity and serious complications. Therefore, this study focuses on the elderly population with mitral regurgitation and renal dysfunction.
The aim was to assess renal dysfunction and its impact on the grade of MR to thus determine prognosis factors in elderly patients.
Methods: This is a single centric prospective study, from 1 October 2017 - 1 January 2019. We included patients 65 years and older with MR isolated or associated with another valvulopathy. Renal function was defined by levels of serum creatinine and GFR was calculated by CKD-Epi method in initial consultation. We divided the patients into 2 groups with MR in elderly G1 with good GFR >60ml/min/m^2 and G2 <60ml/min/m^2. We excluded patients with MR in shock or with acute renal injury due to other causes.
Results: A total of 58 patients were included. The average age was 74 ± 6.4 years, sex ratio was 0.48 and predominant cardiovascular risk factors were diabetes mellitus, hypertension and smoking. Mean serum creatinine 1.00 ± 0.46mg/dL and median GFR was 81ml/min/m^2. MR was isolated in 34 cases, main mechanism was rhumatismal in 29.3%, severe MR was observed in 20.7%, HFrEF and HFmEF in 7 and 14 cases, respectively, with mean SGL at -16.6 ± 4, LV and LA dilatation observed in 31 and 42 patients, respectively, with no statistical signification between the 2 groups. LA volume was correlated with renal dysfunction 51 ± 12mL/m^2 in G2 and 42ml/m^2 in G1 patients, $p=0.01$ OR1.2 (1.05 - 1.3). PAH in MR was present in 50% in G1 vs. 38% in G2 ($p=0.08$). A follow up at 6 months showed aggravation of MR grade in 3.4% in G1 and 8.6% in G2 ($p=0.06$) and at 12 months 5.2% in G1 and 17.2% in G2 ($p=0.025$). Four patients died during follow-up in G2, despite optimal medical treatment.
Conclusion: Few studies have focused on renal function with MR in the elderly. Lower GFR was significantly correlated to MR grade progression and was an independent prognostic factor for mortality.

Outcomes of cognitive impairment in the elderly with valvular heart disease

Zakaria Qechchar, Monia Elmourid, Fatima ezzahra Talhi, Abdenasser Drighil, Leila Azzouzi and Rachida Habbal

Ibn Rochd University Hospital, Cardiology Department, Casablanca, Morocco

Introduction: Cognitive impairment causes changes that are serious enough to be noticed by a patient's inner circle. Approximately 15% - 20% of people 65 years and older have mild cognitive impairment (MCI) which could increase the risk of cardiovascular events. Few studies have investigated the impact of altered mental status on mortality and cardiovascular events, even less in elderly patients with valvular heart disease.

Methods: This monocentric prospective study collected data at the echolab, and during consultations with patients suffering from valvular disease for a period of 12 months. The Mini Mental Status Evaluation, a 30-point questionnaire used extensively in clinical and research settings, was employed to assess MCI. After exclusion for neurological problems and psychiatric disorders, we defined MCI by MMSE <24. We compared 2 groups of patients G1 <70 years and G2 >70 who were eligible to take part in the study. Eighty-six patients were included, 48 in G1 and 38 in G2, mean age was G1: 58 ± 7 vs. G2: 78 ± 5 years. MCI was correlated with female gender (54% vs. 35% p=0.03) and a lower level of education (10% vs. 35% p=0.001). AF was present in 5% in G1 vs. 12% in G2 and heart failure (HF 22% vs. 37%, p=0.035). Mitral stenosis was identified (20% vs. 17%), mitral regurgitation (10% vs. 12%), LVEF >50% in 80% vs. 65%, pulmonary hypertension 38% in each group, whereas aortic stenosis was significantly associated with MCI in the second group of elderly patients (5% vs. 12%, p=0.04). Medical therapy was similar for both groups. Mortality and rehospitalisation in 3 months were significantly higher in G2 (3.6% vs. 12%, p=0.01 and 20% vs. 36%, p=0.002).

Conclusion: Routine assessment of MCI should be done in elderly patients with valvular heart disease, especially in the population with AS. Specific management of such patients should be considered.

Impact of serum lipid levels at admission in acute coronary syndrome

Zakaria Qechchar, Monia El Mourid, Fatima Ezzahra Talhi, Abdenasser Drighil, Leila Azzouzi and Rachida Habbal

Ibn Rochd University Hospital, Cardiology Department, Casablanca, Morocco

Introduction: Blood cholesterol (TC) and triglyceride (TG) levels should be measured when admitting patients with acute coronary syndrome (ACS). However, few data have examined the predictive performance of these tests in our centre.

Methods: The study included 98 patients (63 men and 35 women, aged 59.9 ± 12 years) diagnosed with ACS. Unfortunately, 14 patients' lipid data were lost. We identified 2 groups of patients: Group1 (n=28) defined by lipid abnormalities at admission (CT >200mg/dL, HDL cholesterol >65mg/dL, LDL cholesterol >180mg/dL or TG >200mg/dL) and Group 2 (n=56) defined by normal values of lipid parameters. Lipid profiles and glucose values were collected on days 1 and 4 at the onset of myocardial infarction. We compared cardiovascular risk factors (CVRFs), left ventricular ejection fraction (LVEF) and, less than 3 days after admission, CRP, troponins and intra-hospital and 1-year mortality.

Results: The patient cohort in Group 1, compared to Group 2, was younger (57.8 years vs. 61 years), more prone to hypertension (54% vs. 41%), more prone to diabetes (50% vs. 37.5%), included more dyslipidemias (14.28% vs. 1.25%) but contained fewer chronic smokers (35.7% vs. 60.7%). LVEF was not significantly different in the 2 groups. Troponin I (50.9 vs. 17.82ng/ml) and CRP (81.3 vs. 45mg/l) were higher in Group 1. Lipids tended to decrease on post-phase. No difference was noted in the objective of intra-hospital mortality. At 1 year, 13% succumbed in Group 1 compared to no patients in Group 2.

Conclusion: Lipid levels decreased during the first few days of admission. Differences were noted between cardiovascular risk factors, troponin and CRP values. Patients with increased lipid counts on admission had a poor prognosis at 1 year.

Rationale and design: The host-microbiome interaction in participants at high risk of rheumatic heart disease

Kimona Rampersadh*, Kelin Engel*, Taariq Salie*, James Dale# and Mark Engel*

*University of Cape Town, Rondebosch, South Africa. #University of Tennessee Health Science Centre, Memphis, United States of America

Introduction: Streptococcus pyogenes, also known as Group A streptococcus (GAS), is a gram-positive, ubiquitous bacterial pathogen which causes a range of infections including pharyngitis and post-infectious auto-immune rheumatic heart disease (RHD). Previous studies have reported a GAS prevalence of 21% among children with pharyngeal infection at clinics and 3% GAS carriage in asymptomatic individuals from an endemic RHD community in Cape Town, South Africa. The interaction between the host and GAS has been poorly studied to date. We are seeking to characterise the pharyngeal microbiome of children presenting with pharyngitis to gain an understanding of the transmission dynamics of GAS and the association between the microbiome and host genetics during active and latent GAS infections.

Methods: The proposed study is designed as a longitudinal evaluation of throat cultures from individuals aged 5 - 17 years in Vanguard, Cape Town, with GAS symptomatic and GAS asymptomatic infections. Participants will be evaluated at baseline and every 2 months thereafter, over a 24-month period of observation, with serial throat cultures for genome and microbiome analysis. Additionally, participants will be evaluated should there be intervening pharyngitis episodes. GAS clonality will be assessed by whole genome sequencing while microbiome analysis will be evaluated by 16SrRNA sequencing to investigate taxonomic composition and diversity of the pharyngeal microbiome. Results will be correlated with immune response status to a panel of known GAS antigens.

Results: This project is expected to provide insight into the dynamics between the pharyngeal microbiome and GAS pharyngitis. Microbiome profiles, correlated with specific-strain type and clinical symptoms, will shed light on the nature of active vs. latent infection.

Conclusion: This study seeks to contribute further knowledge to GAS vaccine development efforts as well as the identification of commensal bacteria, or bacterial products, from a healthy microbiome for therapeutic use.

Balloon valvuloplasty for valvular pulmonary stenosis: A 30-year experience at a large tertiary level hospital in South Africa

Phophi Raphulu[*] and Antoinette Cilliers[#]

[*]Gauteng Department of Health, Johannesburg, South Africa. [#]Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Congenital pulmonary valve stenosis (PS) is one of the most common congenital cardiac defects, accounting for 8% - 12% of all congenital cardiac defects. Patients with PS were candidates for surgical valvotomy in the past. Percutaneous balloon pulmonary valvuloplasty (PBPV) has been the preferred alternative treatment since its introduction in 1982 by Kan et al. The aim of this study was to evaluate the efficacy and safety of PBPV over the last 3 decades.

Methods: A retrospective descriptive study was conducted at Chris Hani Baragwanath Academic Hospital (CHBAH) to evaluate patients who underwent PBPV between 1985 and May 2019. Data were extracted from the paediatric cardiology electronic database at CHBAH.

Results: During this study period, 72 patients underwent balloon valvuloplasty. The age of the majority of patients (72%) was 12 - 60 months (mean 35.6). The indications were severe PS defined as peak instantaneous gradient (PIG) >70mmHg in 81% of the patients and moderate PS, PIG >40 - 70mmHg in 19% of the patients. There was a 90% success rate. A suboptimal reduction in pressure gradient was found in 10% of patients, with 8% having dysplastic valves. An iatrogenic suicide right ventricle, where severe right ventricular outflow tract (RVOT) obstruction develops post PBPV, was observed in 2.7% of patients with 1.4% developing reperfusion pulmonary oedema. Moderate pulmonary regurgitation (PR) was observed in 25% of the patients. Only 3% developed severe PR.

Conclusion: This analysis shows that PBPV is a safe and effective treatment for moderate to severe PS. The persistence of a gradient is associated with the presence of dysplastic valves. A quarter of patients develop moderate PR, with few developing severe PR.

Post-resheathing complication of the self-expanding valve in aortic valve transcatheter implant

Raphael Ferreira Rossi, Alberto Fonseca, Luciano Liberato, Edmur Araujo, Marco Passos and Marco Passos

Heart Hospital of Brazil, São Paulo, Brazil

Introduction: Transcatheter aortic valve (TAVI) implantation is an approved procedure for the treatment of severe aortic stenosis in selected patients. A rare complication of the self-expanding valve implant is a fold of the valve's nitinol structure, resulting in a segment of malposition, aortic perivalvular insufficiency and possible valvular leaflet dysfunction.

Methods: We report a case of TAVI. A self-expanding prosthesis, with failure of the valve to expand, causing an important fold throughout the nitinol structure was observed after the aortic valve.

Results: Failure of the valve to expand caused significant folding along the nitinol structure which resulted in a severe paravalvular leak. Balloon valvuloplasty was employed which resulted in the restoration of the metallic structure geometry and reduction in leakage.

Conclusion: Although recapture is a characteristic of this prosthesis, it is important to recognise the angiographic characteristics of a possible complication (straight line signal) and to avoid them.

The AFROStrep registry: Report on the prevalence of pharyngeal group A streptococcal emm-types in Cape Town, South Africa

Mogamat Salie[*], Kelin Engel[*], Kimona Rampersadh[#], Dylan Barth[*], Babu Muhamed[*], Liesl Zühlke[*], James Dale[†] and Mark Engel[*]

[*]University of Cape Town, Rondebosch, South Africa. [#]University of Western Australia, Crawley, Australia. [†]University of Tennessee Health Science Centre, Memphis, United States of America

Introduction: The AFROStrep registry was established in 2016 for the surveillance of beta-haemolytic streptococcal infections in Africa. Of particular interest is the documenting of group A streptococcal (Strep A) pharyngitis that may lead to rheumatic heart disease (RHD), the latter of which places a high burden on the continent. This report presents Strep A emm-type distribution, as contained in AFROStrep to date, as part of the wider vaccine initiative spanning a number of sites worldwide.

Methods: Isolates were obtained, through both active and passive surveillance of patients, 5 years of age and older, presenting with sore throat to local community clinics within a peri-setting of Cape Town, South Africa and through the National Health Laboratory Service. These were complemented with samples collected previously through similar studies by our group. Patient demographics and clinical information were recorded on case

report forms, which were captured in a web-based database, together with isolates information. Streptococcal strains were subjected to the CDC emm-typing procedure.

Results: We report on 750 samples which were obtained over a 10-year period. A diversity of emm-types were isolated (n=60). The prevalence of the top 5 emm-types circulating in the region were: emm76 (10%), emm81(8%), emm48.1(5%), emm183.2 (5%) and emm44 (4%). When comparing coverage against the putative 30-valent vaccine under development, 43% of all circulating strains were included in the vaccine, with cross-protection potentially increasing coverage to 63%.

Conclusion: This report details epidemiological evidence of the diversity of GAS infections within the South African population. Furthermore, it highlights the deficiencies in coverage of the 30-valent vaccine as pertaining to Strep A pharyngeal infection. Given the intention to include more sites within South Africa and Southern African countries (including Namibia, Zambia and Botswana), the AFROStrep registry has tremendous potential to contribute to the prevention and control of Strep A disease, including rheumatic heart disease.

Selective active shimming to reduce field inhomogeneities eliminates off-resonance and frequency artefacts without the need for manipulation of the trufi delta frequency

Petronella Samuels, Stephen Jermy, Marcin Jankiewicz, Ernesta Meintjies and Ntobeko Ntusi

University of Cape Town, Rondebosch, Cape Town, South Africa

Introduction: Balanced steady state free precession (bSSFP) is one of the sequences most susceptible to off-resonance artefacts. The standard approach to dealing with off-resonance artefacts is to use a frequency scout to determine the ideal delta frequency offset but this technique has several limitations. The objective of this pilot study was to examine the role of active shimming methods in modulating bSSFP off-resonance artefacts as a substitute to adjusting the delta frequency.

Methods: Eleven healthy volunteers were scanned on a 3Tesla Skyra (Siemens, Erlangen Germany) whole-body scanner. Prior to acquisition of cine images, a frequency scout in the 4-chamber orientation was obtained to determine the delta frequency offset of the scanner. Two sets of cine images were acquired. For the first set of images, a shim box was positioned over areas of high velocity flow (aorta, pulmonary vessels and superior vena cava) without changing the trufi delta frequency and the size of the shim box varied according to the size of the vessels in each participant. For the second set of images, the shim box size was adjusted to cover the entire heart, and the trufi delta frequency was unadjusted. Data analysis was based on visual interpretation.

Results: From 88 images acquired with a small shim box, only 3 (4%) sequences were not diagnostic. In 2 of the 3 images, artefacts were resolved with a larger shim box over the entire heart. From 88 images acquired with a large shim box, 29 (33%) images were not diagnostic and in 2 subjects all the data acquired with a large shim were non-diagnostic (heart rates of 83 and 57bpm, respectively).

Conclusion: Using a small shim box over the major vessels when acquiring cine images is superior for diminishing artefacts when compared to placement of a large shim box positioned over the entire heart.

SHARE-TAVI registry: TAVI outcomes in a low volume setting

Elizabeth Schaafsma[*], Jacques Scherman[#], Hellmuth Weich[†] and Mpiko Ntsekhe[‡]

[*]SA Heart® Association, Tygerberg Hospital, Bellville, South Africa. [#]Department of Cardiothoracic Surgery, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa. [†]Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. [‡]Department of Cardiology, Groote Schuur Hospital and University of Cape Town, Observatory, South Africa

Introduction: SA Heart®'s prospective multi-centre observational registry, SHARE-TAVI, captures data as part of funding approval processes for all SA TAVI patients and to compare outcomes to international data to thus define local variations in clinical presentation and outcomes.

Methods: From September 2014 - June 2019 inclusive, 1 093 potential TAVI patients were evaluated at 9 Private and 3 State TAVI centres which, combined, implanted >200 patients in 2018. Procedural and complications data were entered according to VARC-2 criteria as well as post-operative follow-up 30 days and yearly.

Results: A total of 145 patients await outstanding funding decisions (0 - 1 176d), average wait 96 days. Delayed funder responses resulted in mortality in 26 patients awaiting decisions and in 11 prior to approved TAVI date. A total of 798 patients (15% in State) received implants (68% with newer generation devices) and are comparable to similar registry and trial populations (GARY, SOURCE 3, and US Corevalve Pivotal) mean age 80.01 ± 7.2 years, 54.1% male, mean risk predictions 6.8 ± 7.0% (STSPROM), 23.2 ± 15.4 (logEuroSCORE) and 6.7 ± 6.0% (EuroSCORE 2). Differences in presentation of risk factors (dialysis, prior CVA/TIA, frailty) at evaluation occur between Private patients (3.7%, 8.9%, 28.1%) and State (0%, 2.82%,

21.1%) but procedural success similar (State 94.0%, Private 94.9%). Mean ICU and total length of stay similar in State (ICU 1.22 ± 1.33d, LOS 4.86 ± 4.12d) and Private (ICU 2.60 ± 3.9d, LOS 5.04 ± 4.96d).
Transfemoral access in 91.7% of patients, procedural complications in 30d cohort include vascular (7.66%), bleeding (5.2%), MI (0.38%), conversion to open heart (0.89%). New PPM at 30d in 7.4% (n=58/783) and 1-year in 10.1% (n=56/557), stroke at 30d in 3.58%. Peri-procedural mortality 2.68% (n=21/783), at 1-year the all-cause mortality of 10.6% (n=59/557) compares favourably to published TAVI populations (14.2% US Corevalve, 12.6% SOURCE 3, 20% GARY), non-cardiac mortality at 31% (n=18/59).
Conclusion: Restrictive funding limits volumes, but TAVI at State and Private centres still compare favourably to international best practice standards. Funding resistance and cumbersome funding approval processes contribute to mortality in appropriately selected patients.

The cardiac effects of pectus excavatum

Ivan Schewitz

Waterfall City Hospital, Johannesburg, South Africa

Introduction: Pectus excavatum has been recognised since its description by Leonardo Davinci. By and large it has been considered a cosmetic condition and the cardiac effects have been ignored. Since 1949 the Ravitch procedure has been the standard operation to correct the condition. This is an invasive, destructive procedure which yields average cosmetic results. As such, the procedure is seldomly performed. However, with the minimally invasive endoscopic Nuss procedure, the number of procedures performed has increased exponentially. The marked cardiopulmonary improvement in patients soon led clinicians to investigate the reason for the improvement, demonstrating that cardiac compression of the right ventricle effects cardiac output.
Methods: This is a literature search based on the work of Drs Pilegaard, Satur and Jaroszewski. Interpretation of cardiopulmonary exercise testing will be presented as well as the cause of exercise dysfunction.
Results: The pre-operative cardiac index was below the control group, normalising 3 years after repair. Echocardiography demonstrated an increase in the right atrial size and in the right ventricular ejection fraction.
Conclusion: Increased severity of a pectus excavatum leads to a progressive decrease in cardiac output. Repair of a pectus excavatum leads to early improvement in cardiac function which is sustained in long-term follow-up.

Retrospective study of radio frequency ablation for accessory pathways at Groote Schuur Hospital

Azhar Seedat, Charle Viljoen, Max Rath, Andrew Beeton and Ashley Chin

Division of Cardiology, Groote Schuur Hospital and the University of Cape Town, Observatory, South Africa

Introduction: Patients with accessory pathways (AP) are at risk of becoming symptomatic [palpitations and/or syncope from atrioventricular re-entrant tachycardia (AVRT)] and may rarely suffer from sudden cardiac death. Radiofrequency ablation (RFA) is a curative procedure for AP.
Methods: We conducted a retrospective folder review of all patients who underwent RFA of AP at Groote Schuur Hospital between 2007 and 2016. We studied their clinical characteristics, AP location, RFA procedures and outcomes.
Results: This cohort of 104 patients had a median age of 36 years (IQR 25 - 44). The most common presenting symptoms included palpitations (87.5%) and syncope (26.0%). However, 2 patients were asymptomatic and were identified on screening ECGs. Analysis of pre-procedure ECGs showed Delta wave morphology in 73 patients, of which 15 had a QRS width of <120ms. Only 1 patient presented with pre-excited atrial fibrillation. The most common AP locations were left lateral (25.0%) and right posterior-septal (19.2%). The RFA procedure required a median of 5 deliveries of radiofrequency energy, which was similar for left- and right-sided AP. RFA was largely successful (94.2%) at first attempt. However, in 6 patients we could not permanently eliminate antegrade and retrograde AP conduction. Another 5 patients had recurrence of symptoms at follow-up. Of these 11 patients, 1 patient declined further intervention, but 9 had a successful second RFA procedure (3 had more than 1 AP, and in another patient left- and right-sided AP were found). In 1 patient RFA was successful at the third attempt. Though there were more right-sided AP (7 vs. 3) amongst patients that required more than one RFA procedure, there were no demographic or clinical predictors of successful RFA at first attempt. Complications were uncommon (1 sub-epicardial aneurysm, 1 haematoma at puncture site).
Conclusion: RFA is a successful procedure for the treatment of AP in our setting.

The evolution of paediatric cardiac surgery in Namibia

Fenny Shidhika*, Alfred Mureko*, Henning du Toit*, Nico Feris*, Wim De Mey* and Johan Brink#

*Windhoek Central Hospital, Windhoek, Namibia. #Red Cross War Memorial Children's Hospital, Groote Schuur Hospital, University of Cape Town, Observatory, South Africa

Introduction: Heart disease in children represent significant mortality, akin to other developing countries, paediatric surgical programmes are under-developed. In 2008, an adult cardiac surgery programme was established, with an agreement between Namibia and South Africa, whereby staff were to be trained at Groote Schuur and Red Cross Children's Hospitals. Children with heart disease managed by a resident cardiologist were then referred to Christiaan Barnard Memorial Hospital for surgery. In July 2018, the first Namibian paediatric cardiologist returned from training. In September, the first congenital surgical mission was conducted with support from Cape Town to assess viability for a local programme. Since January 2019, upon return of the Namibian paediatric cardiac surgeon, we have been performing surgery on children. Critical skills posed some challenges. In this review, we present outcomes and future prospects for this young service.

Methods: We reviewed our surgical database. Data included demographics, diagnoses, risk scores, surgery, morbidity and mortality details. Continuous variables were expressed as means, or medians, with interquartile ranges. Categorical variables were expressed as absolute numbers and percentages. Regression models were used to assess risk factors for mortality.

Results: Seventy patients, between the age of 3 months - 18 years, were studied. Case mix were CHD and RHD in the RACHS-1 categories 1 - 3. Infection posed a major complication. Two patients died in the early post-operative period.

Conclusion: A successful paediatric cardiac service demands resources and team commitment. While challenges remain, the service is expected to grow with assistance from our collaborating institutions.

Personal air pollution exposure is associated with markers of cellular aging and cardiovascular risk: Findings from the EndoAfrica study

Hans Strijdom*, Patrick De Boever#, Tim Nawrot†, Nandu Goswami‡, Ingrid Webster*, Mashudu Mthethwa*, Nyiko Mashele*, Festus Kamau*, Dries Martens†, Sana Charania* and Frans Everson*

*Stellenbosch University and Tygerberg Hospital, Bellville, South Africa. #VITO/Hasselt University, Hasselt, Belgium. †Hasselt University, Hasselt, Belgium. ‡Medical University of Graz, Graz, Austria

Introduction: Exposure to ambient nitrogen dioxide (NO2) and BTEX (benzene, toluene ethyl-benzene and m+p and o-xylenes) is associated with adverse health effects. However, limited information is available regarding the effects of personal exposure to these compounds in South African populations.

Methods: This 6-month follow-up study aimed to determine 7-day personal ambient NO2 and BTEX exposure levels via compact passive diffusion samplers in female participants (n=61) from Cape Town. This was done in an effort to investigate whether personal exposure levels are associated with cardiovascular effects, leucocyte telomere length (LTL) and vascular markers of injury including: flow-mediated dilatation (FMD), retinal microvascular calibres and carotid intima-media thickness (C-IMT).

Results: Overall, the measured air pollutant exposure levels were lower compared to international standards. Each 4.96µg/m^3 standard deviation (SD) increase in NO2 was associated with a 4.58% decrease in LTL (p=0.001), whereas a 2.08µg/m^3 SD increase in benzene was associated with 4.59% decrease in LTL (p=0.004). Furthermore, each SD increase in NO2 was associated with 2.42mmHg increase in systolic blood pressure (SBP) (p=0.047), 1.76mmHg increase in diastolic blood pressure (DBP) (p=0.05), 2.08µm decrease in the retinal venular width (p=0.048) and 0.11mm narrowing of the brachial artery diameter (p=0.005). Each 2.51µg/m^3 SD increase in o-Xylene was associated with 2.01mmHg increase in DBP (p=0.029) and benzene positively associated with C-IMT (24.88µm; p=0.032). The urinary metabolite 3+4-methylhippuric acid (3+4MHA; a marker of xylene exposure) was associated with reduced FMD (-1.446%; p=0.003).

Conclusions: Our findings show that personal air pollution exposure, even at relatively low levels, was associated with cellular ageing (shorter LTL) and several markers of cardiovascular risk (including increased blood pressure, reduced endothelial function and changes in retinal microvessels) in women residing in Cape Town.

Radial artery dimensions in South African patients undergoing transradial coronary angiography

A. Swanepoel, J. Doubell, J. Steyn, C. Bezuidenhout and A. Doubell

Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa

Introduction: Transradial coronary angiography (TRA) is preferred over transfemoral coronary angiography due to a superior safety profile, but cannulation poses a greater challenge with unique complications such as radial artery occlusion (RAO). Radial artery size and its relationship with cannulation success and complication rates have not been studied in a South African population. We aimed to record radial artery (RA) dimensions in a South African population and study the relationship between RA dimension, cannulation success and complication rates.

Methods: Stored radial artery ultrasound examinations obtained with a Logic E Ultrasound Machine with a 22MHs probe in patients who participated in the RADIAL study (Doubell, et al., 2018) were measured to obtain a radial artery diameter, circumference and area. Measurements were correlated with cannulation success and complication rates.

Results: A cohort of 949 patients were included in the study. The normal distribution of RA dimensions (95% confidence interval) were: diameter 1.45 - 3.41mm; circumference 4.65 - 11.49mm; area 1.83 - 10.06mm^2. In patients with a RA area below 3.0mm^2 cannulation was unsuccessful in 15.6% and RAO occurred in 8.05%. Radial artery areas above 3.0mm^2 had 98.24% successful cannulation and RAO occurred in 2.54%. Females had a mean RA diameter of 2.17mm and area of 4.29mm^2 and males a mean RA diameter of 2.8mm and area of 5.44mm^2.

Conclusions: The normal distribution of RA dimensions in South African patients range from 1.45 - 3.41mm in diameter and 1.83 - 10.06mm^2 in area. Cannulation success is lower in smaller radial arteries with a higher complication rate. Females have smaller radial arteries than males. RA dimensions should be taken into account when planning the access route for coronary angiography.

Reference: Doubell J., Kyriakakis C., Weich H., et al. Radial artery dilatation to improve access and lower complication rates during coronary angiography (RADIAL): A randomised controlled trial, European Heart Journal 2018, Volume 39, Issue suppl_1, P5519.

Single centre experience of congenitally corrected transposition of the great arteries over 17 years

Lenise Swanson

University of Cape Town, Rondebosch, South Africa

Introduction: Congenitally corrected transposition of the great arteries (CCTGA) is a rare and complex cardiac anomaly, accounting for less than 1% of all congenital heart defects. Management strategies and outcomes vary according to the associated cardiac defects and functional state of the systemic ventricle.

Methods: We conducted a retrospective folder review of patients with confirmed CCTGA from 1 January 2000 - 31 August 2017 to describe the most-commonly associated cardiac defects, the management strategies and outcomes for these patients. Patients who were last followed up more than 24 months previously, or whose clinical notes were incomplete, were excluded from this study.

Results: Thirty-six patients with CCTGA were identified for this study, of which 21 were eligible for inclusion (10 male, 47,6%). Median age at presentation was 2.7 months. Presenting complaints were: murmurs (57.1%), cyanosis (57.1%) and respiratory distress (23.8%). One patient had been diagnosed antenatally. VSD (85.7%), pulmonary stenosis (47.6%) and PDA (38.1%) were the most commonly associated cardiac lesions. Two patients had associated syndromes or congenital abnormalities. Eight patients were suitable for biventricular repair for which 3 double switch operations (length of stay 10 - 14 days, mean 12 days), 1 Senning-Rastelli (length of stay 14 days) and 4 pulmonary artery banding procedures were performed. Six patients were selected for the univentricular pathway, with 5 Glenn shunts and 1 completed Fontan surgery (length of stay 21 days) having been done. Two patients were considered to be inoperable due to the complexity of their cardiac anatomy. The surgical mortality rate was zero. Pleural effusions and chylothorax were the most common post-surgical complications (4.7% each). Complete heart block was present in 1 patient (post-Senning-Rastelli) and required permanent pacemaker implantation.

Conclusion: We demonstrate a varied surgical approach to patients with CCTGA over almost 2 decades. While surgical correction has been shown to render early successes, long-term follow-up is necessary to monitor for late onset complications. This remains a challenge in our setting.

The unguarded mitral valve orifice associated with the hypoplastic left heart syndrome: A case report

Farirai Fani Takawira*, Greenwood Sinyangwe#, Hendrik Mamorare# and Eric Schurman#

*Steve Biko Academic Hospital and University of Pretoria, Hatfield, Pretoria, South Africa. #Sunninghill Hospital, Sunninghill, Sandont, South Africa

Introduction: The unguarded mitral valve orifice is a rare congenital heart defect characterised by the complete agenesis of the mitral valve leaflets and apparatus. The abnormality leads to free intrauterine regurgitation of the atrioventricular valve orifice and plays a significant role in the maldevelopment of the left ventricle and aorta. We report on a case of the unguarded mitral valve orifice associated with the hypoplastic left heart syndrome (HLHS). While mitral valve atresia and aortic valve atresia are known causes for the hypoplastic left heart syndrome, this case highlights how free mitral regurgitation and the subsequent left ventricular volume loss in the developing heart can lead to development of HLHS.

Methods: Case report

Results: A term AGA neonate was delivered by normal vertex delivery to a 32-year-old Para 1, gravida 2 mother. After a few hours he was noted to have cyanosis, which did not respond to the administration of O2. On examination he had saturations of 83% on 100% FiO2 and he was being ventilated. His pulse was 125/min, with globally weak volume pulses. BP was 58/33. No cardiomegaly, murmur or CCF. Echocardiography revealed an unguarded mitral valve orifice. The LV was small and hypoplastic. A small PFO was present, with a dilated left atrium. There was aortic atresia and a hypoplastic ascending aorta. There was a large PDA with bidirectional shunting present. A diagnosis of the hypoplastic left heart syndrome associated with the unguarded mitral valve orifice was made. Prostaglandin infusion was started and he underwent a stage 1 Norwood operation with atrial septectomy. Sadly, he died a few days later.

Conclusion: The unguarded mitral orifice is a rare cardiac malformation. There is free mitral regurgitation with unobstructed to-and-fro flow between the left atrium and left ventricle. The subsequent decreased LV volume leads to underdevelopment of the LV and the subsequent HLHS, which has a high morbidity and mortality. Very few cases have been reported in the English literature.

Assessing the diagnostic accuracy of a 5-cable electrocardiogram prototype

Gideon Titus, Hellmuth Weich and Anton Doubell

Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa

Introduction: The 12-lead ECG is a standard part of cardiac assessment. However, it is often omitted, or performed incorrectly. A new 5-cable ECG, which is easier to perform and could thus decrease the risk of incorrect cable/electrode placement as well as reduce healthcare cost, was created. The primary aim of this study is to determine whether the diagnostic accuracy (printed tracing) of the 5-cable ECG prototype is sufficient so that it can be used instead of the standard 12-lead ECG machine. A secondary aim is to determine whether the 5-cable ECG prototype can use machine learning algorithms to correctly distinguish normal from abnormal ECGs.

Methods: ECGs were performed on 200 adult patients (age ≥18 years) who presented to Tygerberg Hospital's coronary care unit and cardiac outpatients. A 12-lead ECG was performed, immediately followed by a 5-cable ECG. These printouts were randomised and interpreted blindly by an independent cardiologist for both classification (normal, abnormal, variations not necessarily indicating pathology, unclassified) and diagnosis. The 5-cable ECG prototype was trained in accordance with a pre-existing ECG database to classify ECGs as normal or abnormal through the use of machine learning algorithms in a neural network developed by the Stellenbosch University Biomedical Engineering Research Group.

Results: The 5-cable prototype generated interpretable ECGs in 49% (n=98) of cases. Analysis of the 98 ECGs determined that use of the 5-cable printout was comparable to use of the standard 12-lead ECG printout in order to assess classification ($p>0.1$). However, diagnosis differed significantly from diagnosis based on the 12-lead ECG ($p<0.0001$). The 5-cable ECG prototype neural network could distinguish normal from abnormal with an accuracy of 70%.

Conclusion: The 5-cable machine is still a prototype which requires refining. Its tracings cannot be used for diagnostic purposes but can generate ECGs leading to an accurate classification of normal vs. abnormal. The neural network algorithms have potential for use in future screening programmes.

S100 calcium-binding protein B and silent ischaemic events: Indicators of emergent brain-heart pathology

Nina Truter*, Leone Malan# and M. Faadiel Essop

*Faculty of Medicine and Health Sciences, University of Stellenbosch and Tygerberg Hospital, Bellville, South Africa. #Hypertension in Africa Research Team (HART), North-West University, Potchefstroom, South Africa

Introduction: As cardiovascular disease (CVD) is the leading global cause of mortality, earlier diagnosis is needed. Although previous studies have identified traditional risk factors (e.g. inactivity, poor diet, smoking and obesity), recent studies highlight the role of psychosocial stress. The brain-heart axis is thus an emerging concept which better explains the link between stress and CVD onset. This study aims to elucidate the correlation between S100 calcium-binding protein B (S100B; brain and cardiac ischaemia marker); glial cell line-derived neurotrophic factor (GDNF; neuroprotective marker) and a known clinical CVD marker (silent ischaemic events), which may improve our understanding of the brain-heart axis and emerging pathology.

Methods: This cross-sectional study consisted of a bi-ethnic cohort of urban-dwelling male and female teachers (n=409) with similar socio-economic status (North-West province). Silent ischaemic events were recorded using a 24-hour electrocardiograph and immunoassays were performed to evaluate S100B and GDNF serum levels. To determine group differences, statistical analyses were performed using ANCOVAs and partial correlations completed using clinical marker data.

Results: Serum S100B and GDNF levels differed significantly between men and women (0.04 vs. 0.05g/L; $p<0.01$ and 572.48 vs. 280.63pg/mL; $p<0.05$, respectively) independent of covariates. Differences were also found between African and Caucasian men regarding the number (11.72 vs. 0.84; $p<0.001$) and maximum duration of silent ischaemic events (64.04 vs. 4.77 minutes; $p<0.05$) as well as S100B serum levels (0.05 vs. 0.04; $p<0.001$). A significant positive correlation was observed between S100B and the number and duration of ischaemic events in men (0.37; $p<0.01$ and 0.31; $p<0.01$, respectively). S100B also correlated with ischaemic event duration in women (0.24; $p<0.05$).

Conclusion: Silent ischaemic events may be predictive of ongoing glial cell apoptosis, potentially supporting a link between glial cell plasticity and the heart. This study provides a deeper understanding as to the bidirectional communication between the heart and the brain.

Clinical characteristics of idiopathic dilated cardiomyopathy in Johannesburg

Nqoba Tsabedze*, Dineo Mpanya*, Claude Bailly#, Sacha Grinter*, Engela Fouche*, Samantha Nel* and Pravin Manga*

*Division of Cardiology, Department of Medicine, Faculty of Health Sciences, University of the Witwatersrand, Charlotte Maxeke Johannesburg Academic Hospital, Johannesburg, South Africa. #Division of Human Genetics, National Health Laboratory Services and School of Pathology, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Idiopathic dilated cardiomyopathy (IDCM) is one of the common causes of heart failure in sub-Saharan Africa. Affected individuals present with heart failure with reduced ejection fraction with no primary or secondary cause. In sub-Saharan Africa, the clinical manifestations and the prevalence of the genetic contribution to this disease are unknown. We aim to describe the clinical features of patients presenting with heart failure of unknown origin and to exclude primary and secondary causes to confirm IDCM.

Methods: Since July 2015, all inpatients and outpatients with dilated cardiomyopathy (DCM), without an aetiology presenting to the division of cardiology at the Charlotte Maxeke Johannesburg Academic Hospital were screened. These patients were systematically investigated to exclude primary and secondary causes of heart failure. This included screening on history, clinical examination, biochemical investigations, coronary angiography to exclude ischaemic heart disease and performing cardiac magnetic resonance imaging to exclude primary myocardial diseases and infiltrative diseases. A clinical geneticist further interrogated patients with IDCM to obtain a history of familial dilated cardiomyopathy.

Results: We screened 288 patients with heart failure of unknown origin. One hundred patients were recruited into the study and were confirmed to have idiopathic DCM. This cohort consists of 92 Black patients of which 66 were males with a mean age of 47.1 ± 12.8 years.

Conclusion: IDCM is prevalent among young adult Black males with a high mortality rate, 18% of affected patients demise within a year. A genetic aetiology should thus be considered in young Black patients presenting with IDCM.

Protein phosphatase 2A and protein dephosphorylation in the heart's response to ischaemia/reperfusion

Derick Van Vuuren, Charlize White, Lutendo Maumela and John Lopes

University of Stellenbosch and Tygerberg Hospital, Bellville, South Africa

Introduction: Treatment of myocardial infarction relies primarily on limiting the duration of ischaemia. Cardioprotective interventions, however, prove that injury can be minimised by the modulation of intracellular signalling pathways which are largely dependent on reversible protein phosphorylation. Relatively little is known regarding the importance of protein dephosphorylation, mediated by protein phosphatases, in this setting. The aim of this study was therefore to determine the effect of ischaemia on protein phosphatase activity, specifically the role and importance of protein phosphatase 2A (PP2A) in ischaemia.

Methods: Cardiac H9c2 cells were exposed to 2 hours of simulated ischaemia (SI) in the presence and absence of either an inhibitor (Cantharidin, 2μM or 5μM) or activator (FTY720, 1μM or 5μM) of PP2A. In addition, an isolated working mouse heart model was exposed to 20 minutes of global ischaemia and either 10 or 60 minutes of reperfusion in the presence or absence of another PP2A inhibitor, okadaic acid (OA, 50nM), administered prior to ischaemia.

Results: Non-specific determination of protein phosphatase activity in H9c2 cells at the end of SI showed that SI exerted no effect on overall phosphatase activity. Pharmacological modulation of PP2A also failed to exert an effect on SI-induced cell death. Despite this, OA administration reduced infarct size in isolated mouse hearts exposed to ischaemia/reperfusion. Initial phosphoproteomic results show that PP2A inhibition, prior to ischaemia/reperfusion, is associated with a change in the phosphorylation of 58 proteins in the mouse heart. These proteins are involved in several processes, including cytoskeletal, mitochondrial and calcium handling dynamics.

Conclusion: Although our non-specific data indicate that the protein phosphatases are not modulated by ischaemia/reperfusion, specific focus on PP2A reveals the dynamic nature of protein phosphorylation in response to ischaemia and further highlights the fact that protein phosphatases, such as PP2A, remain potentially interesting targets for cardioprotective interventions.

Low brain-derived-neurotrophic-factor reflects attenuated retinal vascular function and increased stroke risk: The SABPA study

Annemarie Wentzel*, Leone Malan* Roland von Känel*,#, Wayne Smith*,†, Roelof van Wyk‡ and Nicolaas Malan*

*Hypertension in Africa Research Team HART, North-West University, Potchefstroom, South Africa. #Department of Consultation-Liaison Psychiatry and Psychosomatic Medicine, University Hospital Zurich, University of Zurich, Zurich, Switzerland. †South African Medical Research Council, Unit for Hypertension and Cardiovascular Disease, North-West University, Potchefstroom, South Africa. ‡Surgical Ophthalmologist, Potchefstroom, South Africa

Introduction: Assessment of retinal vessel function provides an automated approach to non-invasively assess the condition of the cerebral microvasculature and susceptibility for stroke. Brain-derived neurotrophic factor (BDNF) may constitute a potential link between cerebral and retinal blood flow, specifically alterations in local perfusion that occur in response to changes in neuronal activity, termed neurovascular coupling. We investigated associations between retinal vessel function during flicker-light-induced-provocation (FLIP) and systemic BDNF levels.

Methods: A bi-ethnic cohort of the Sympathetic activity and Ambulatory Blood Pressure in Africans (SABPA) study (n=280), aged 23 - 68 years, was investigated. Prospective observations for serum BDNF and 24-hour blood pressure (BP) were obtained. During the 3-year follow-up measurements, retinal vessel calibres were quantified from mydriatic eye fundus images and dynamic retinal vessel responses were determined during FLIP. The University of California stroke-risk score was applied to assess subclinical 10-year stroke risk.

Results: Lower BDNF levels (1.3 - 1.8ng/mL) were observed in the total cohort compared to reference ranges (6.97 - 42.6ng/mL). Compared to Caucasians, Africans showed higher BP and BDNF levels and a greater prevalence of retinopathy (73% vs. 40%). In Africans, arteriolar maximal dilation and maximal constriction was positively associated with BDNF ($p=0.051$ and $p=0.029$). Arteriolar diameter after flicker cessation was positively associated with BDNF ($p<0.001$). Arteriolar constriction time was inversely associated with BDNF in Africans ($p=0.035$), yet positively in the Caucasians ($p=0.024$). The BDNF cut-point of 1.5ng/mL was associated with an increased 10-year stroke risk with an odds ratio of 1.56 (95% CI, 0.94; 2.06, $p=0.011$), irrespective of race or gender.

Conclusion: The observed attenuation in retinal vessel responses and increased stroke risk may indicate the diminished neuro-protective effect of BDNF in the SABPA cohort. BDNF may possibly act directly on vascular-smooth-muscle-cells to alter arteriolar vascular resistance and contribute to disturbed neurovascular coupling and increased stroke risk within the SABPA cohort.

Attenuated retinal vascular dynamics in excessive alcohol consumers: The SABPA study

Annemarie Wentzel*, L Malan* Roland von Känel*,# and Nicolaas Malan*

*Hypertension in Africa Research Team HART, North-West University, Potchefstroom, South Africa. #Department of Consultation-Liaison Psychiatry and Psychosomatic Medicine, University Hospital Zurich, University of Zurich, Zurich, Switzerland

Introduction: Excessive alcohol consumption contributes to microvascular structural and functional modifications. Additionally, in the brain-heart axis, it influences glial cell function and possibly neurovascular coupling. Due to ethnic and gender disparities in the metabolism and tolerance of alcohol, the modifications and mechanisms involved may differ. Associations were assessed in excessive alcohol consumers between retinal vasculature and glial markers [brain-derived neurotrophic factor (BDNF), glial-cell-derived neurotrophic factor (GDNF) and calcium-binding-protein-B (S100B)].

Methods: A bi-ethnic target population study, the Sympathetic activity and Ambulatory Blood Pressure in Africans (SABPA), was used (n=319). Alcohol consumption was determined according to previously defined ethnic-specific gamma-glutamyl-transferase (GGT) cut-points, where GGT >19.5U/L and GGT >55U/L indicated excessive alcohol consumption in Caucasians and Africans, respectively. We assessed ambulatory blood pressure and applied the University of California 10-year stroke-risk score. Fasting serum BDNF, GDNF and S100B levels were obtained. Retinal vessel calibres were quantified from mydriatic eye fundus images and dynamic retinal vessel responses were determined during flicker-light-induced-provocation (FLIP).

Results: Excessive alcohol consumers had higher 24-hour hypertension prevalence ($p<0.001$), 10-year stroke probability, wider retinal venules and poorer retinal arteriolar constriction and venular dilation ($p<0.001$). Lower levels of BDNF, GDNF and S100B ($p<0.05$) were observed in the excessive alcohol consumers. In African excessive alcohol consumers, wider retinal venules associated with increased levels of S100B ($p=0.019$), whilst attenuated retinal venular dilation inversely associated with S100B ($p=0.010$). Retinal arteriolar diameter after-FLIP inversely associated with both BDNF ($p=0.013$) and glycated-haemoglobin ($p=0.048$) in the Caucasian excessive alcohol consumers alone.

Conclusion: The wider venules observed in excessive alcohol consumers is a recognised stroke risk marker. The neurotoxic effect of excessive alcohol consumption may possibly facilitate apoptosis and attenuate retinal vascular dynamics in the African group. Yet, in the Caucasian group, this effect may trigger a compensatory, detrimental metabolic response in an attempt to sustain glial health.

Cardiovascular risk profile and acute mental stress alpha or beta-adrenergic responses in a bi-ethnic population: The SABPA study

Annemarie Wentzel*, Leone Malan*, Roland von Känel#, Mark Hamer† and Nicolaas Malan*

*Hypertension in Africa Research Team HART, North-West University, Potchefstroom, South Africa. #Department of Consultation-Liaison Psychiatry and Psychosomatic Medicine, University Hospital Zurich, Zurich, Switzerland. †School Sport, Exercise and Health Sciences, Loughborough University, Loughborough, United Kingdom

Introduction: Acute laboratory stressors elicit adrenergic responses identical to that of everyday stress. Whether specific cardio-metabolic and CVD-risk can, however, be attributed to a predominant alpha or beta-adrenergic response, elicited during acute mental stress, remains to be determined. We aimed to characterise the specific cardio-metabolic risk profiles of predominant alpha or beta-adrenergic responses, irrespective of age, race and/or gender.

Methods: The Sympathetic activity and Ambulatory Blood Pressure in Africans (SABPA) study was conducted in a bi-ethnic target population (n=392), aged 20 - 65 years. An acute mental stress task (STROOP) was administered for 1 minute whilst continuous blood-pressure and 10-lead ECG responses were obtained. Haemodynamic reactivity profiled participants' responses as optimal alpha-adrenergic [decreases in cardiac output (CO) and arterial compliance (Cwk)] and beta-adrenergic (increases in CO and Cwk) responses. Of the 392 participants, 48 were optimal alpha-adrenergic and 69 were optimal beta-adrenergic responders. Fasting blood samples were analysed for cardiac stress and cardio-metabolic risk markers. The University of California stroke-risk score was used to determine 10-year stroke-risk probability.

Results: Alpha-adrenergic responders presented with a poorer cardio-metabolic profile, higher levels of glycated haemoglobin, insulin, greater insulin resistance (HOMA-IR) and lower HDL-cholesterol. Age, race and gender adjusted multivariable logistic regression analyses showed that an alpha-adrenergic profile had higher odds ($p<0.020$) of obesity (OR 1.35, 95% CI 1.15 - 2.91), low HDL cholesterol (OR 1.07, 95% CI 1.02 - 1.22), hypertension (OR 5.36, 95% CI 3.21 - 7.55), cardiac stress (OR 1.01, 95% CI 0.99 - 1.02), ischaemic events (OR 1.06, 95% CI 1.00 - 1.11) and 10-year stroke probability (OR 4.17, 95% CI 2.58 - 6.32).

Conclusion: Irrespective of age, race and/or gender, an alpha-adrenergic acute stress response profile was associated with an increased risk of cardio-metabolic and ischaemic risk factors. Clinical implications suggest that an alpha-adrenergic stress response may, in itself, be a risk factor for CVD.

Infective endocarditis in infants and children in the Western Cape, South Africa

Mark Willoughby

Red Cross War Memorial Children's Hospital, Rondebosch, South Africa

Introduction: Infective endocarditis is a microbial infection of the endothelial surface of the heart, predominantly the heart valves, that is associated with high mortality and morbidity. Limited contemporary data exist regarding affected children in our context. Therefore, we aimed to describe the profile and treatment outcomes of infant and childhood endocarditis at our facilities.

Methods: This is a retrospective review of infants and children with endocarditis at 2 public-sector hospitals in the Western Cape province of South Africa over a 5-year period. Patients with definite and possible endocarditis, according to Modified Duke Criteria, were included in the review.

Results: Forty-nine patients were identified for inclusion; 64% of patients met definite and 36% possible criteria. The in-hospital mortality rate was 20%, 53% of patients underwent surgery with a post-operative mortality rate of 7.7%. The median interval from diagnosis to surgery was 20 days (interquartile range 9 - 47 days). Valve replacement occurred in 28% and valve repair in 58%. There was a significant reduction in valvular dysfunction in patients who underwent surgery and only a marginal improvement in patients treated medically. Overall, 43% of patients had some degree of residual valvular dysfunction.

Conclusion Endocarditis is a serious disease with a high in-hospital mortality and it presents challenges in the making of an accurate diagnosis. Despite a significant reduction in valvular dysfunction, a portion of patients had residual valvular dysfunction. Early surgery is associated with a lower mortality rate, but a higher rate of valve replacement, when compared to delayed surgery.

Impact of rheumatic heart disease educational jingles on knowledge and attitudes of the lay public in Jos, Plateau State, Nigeria

Christopher Yilgwan*, Fidelia Bode-Thomas*, Olukemi Ige*, Cornelius Gofung*, Santos Ayuba Larab# and Mary Aliu-Chatta†

*University of Jos, Jos, Nigeria. #Jos University Teaching Hospital, Jos, Nigeria. †Heart Aid Trust plc., Jos, Nigeria

Introduction: Although rheumatic heart disease (RHD) is highly preventable, it remains a major health problem in many countries. Raising public awareness about RHD could help reduce its burden. We sought to evaluate the impact of educational jingles about RHD on the knowledge base of the lay public in Jos metropolis.

Methods: To field-test educational jingles developed as part of the "Kick RHD out of Plateau State" Project, we administered a simple questionnaire to respondents comprising 10 multiple choice questions assessing knowledge and attitudes regarding sore throats, rheumatic fever and RHD, before and after listening to a jingle in any of 3 languages (English, Hausa or Berom). Pre- and post-test scores were compared using the paired t-test, whilst scores between and within language groups were compared using the ANOVA or the student t-test.

Results: Of 147 respondents, the majority (104, 70.7%) were females ($p<0.001$). Fifty-seven (38%), 44 (29.9%) and 46 (31.3%) respondents listened to the English, Hausa and Berom jingles, respectively. The overall mean pre-test score of 3.48 (± 1.82) did not differ significantly according to language ($p=0.72$) or gender ($p=0.1$). The overall mean post-test score of 5.76 (± 2.61) was also similar between genders ($p=0.59$) and language groups ($p=0.26$) but was significantly higher than the pre-test scores, both overall and by language group ($p<0.0001$ in each case).

Conclusion: The educational jingles had a significant impact on the knowledge base of the sample population and could therefore be a vital tool in raising lay public awareness in the fight against RHD.

The "Kick Rheumatic Heart Disease out of Plateau State" project

Christopher Yilgwan*, Fidelia Bode-Thomas*, Olukemi Ige*, Cornelius Gofung*, Santos Ayuba Larab# and Mary Aliu-Chatta†

*University of Jos, Jos, Nigeria. #Jos University Teaching Hospital, Jos, Nigeria. †Heart Aid Trust plc., Jos, Nigeria

Introduction: Rheumatic Heart Disease (RHD) is a major health problem in Nigeria. It is, however, not formally recognised as a public health priority. RHD prevention and control efforts could be greatly enhanced if appropriate educational and advocacy tools were made available. We set out to produce culturally relevant information, education and communication materials (IECMs) targeted at the lay public and patients/families with RHD, in 3 languages (Berom, English and Hausa).

Methods: Advocacy visits to key stakeholders, including community leaders, the State Ministry of Health (MoH), media organisations and health workers, to mobilise support for the project were undertaken. Patients with RHD and their families were mobilised during routine clinic visits or via telephone calls. Focus group discussions (FGDs), aimed at identifying misconceptions/knowledge gaps regarding sore throat and RHD, were conducted

in the 3 languages amongst RHD patients/family members and in 2 local communities to ensure these were addressed in the proposed IECMs. A team of cardiologists worked with other health care professionals (HCP) to draft a training manual containing key messages to be conveyed via the IECMs. The project team worked with media practitioners to produce the IECMs and field-testing was done to evaluate their acceptability and impact on the target populations.

Results: Posters and educational leaflets were developed in English and Hausa, while audio jingles were produced in Berom, English and Hausa. Preliminary field-testing showed significant differences in pre- and post-test scores in terms of knowledge about RHD.

Conclusion: Culturally appropriate educational materials can be useful in disseminating information and improving knowledge about RHD.

Using visual and auditory tools in evaluating knowledge about rheumatic heart disease: The "Kick RHD out of Plateau" example

Christopher Yilgwan*, Olukemi Ige*, Santos Tanshak Larab*, Cornelius Gofung#, Fidelia Bode-Thomas*

*University of Jos, Jos, Nigeria. #Jos University Teaching Hospital, Jos, Nigeria.

Introduction: Rheumatic heart disease has important public health implications for many communities in the developing world. Poor health literacy on the determinants of the disease has been one of the main drivers of the problem. We evaluated the health knowledge of lay people in a Nigerian community using visual and auditory tools to identify gaps in knowledge, attitude and practice.

Methods: This was a qualitative study that evaluated the health literacy of 103 people living in suburban communities in Jos, Nigeria. An assessment questionnaire was used to investigate their health literacy knowledge, attitudes and practices regarding sore throat, rheumatic fever and rheumatic heart disease before, and after, administering the educational chart, or jingle, in a local language (Hausa). The pre- and post-test results were then computed for each individual and the mean change in scores calculated using the paired t-test. SPSS version 23 was used for all statistics. Significance testing was set at $p=0.05$.

Results: Sixty-three percent of the respondents were females while the mean age was 47.6 ± 19.2 years. The mean pre-test score was 2.78 on a scale of 10 for the visual tool while the mean post-test score was 4.90 ($r=0.3$, $p=0.04$). For the auditory tool (jingles), the mean pre-test score was 3.3, while the mean post-test score was 5.2 ($r=0.45$, $p=0.002$). The mean change in score was 2.1 ± 2.8 (95% CI 1.4 - 2.9, $p<0.001$) for the visual tool and 1.8 ± 2.2 (95% CI 3.3 - 5.2, $p=0.01$) for the jingle.

Conclusion: Both tools significantly improved baseline knowledge about rheumatic heart diseases in a lay community. The poster, however, appears to have had a greater effect.

Response to the Addis Ababa communiqué on the eradication of rheumatic heart disease in Africa: A progress update from the PASCAR RHD task force

Liesl Zühlke*, Mark Engel, Ana Olga Mocumbi†, Sulafa Ali‡, Ashmeg Abdulla◊, Christopher Hugo-Hamman§, David WatkinsΔ and Saad Subahi+, *

*Children's Heart Disease Research Unit (CHDRU), Department of Paediatrics, Red Cross War Memorial Children's Hospital, University of Cape Town, Observatory, South Africa. #Department of Medicine, University of Cape Town, Rondebosch, South Africa. †Instituto Nacional de Saúde, Mozambique and PASCAR Vice South Africa. ‡University of Khartoum and Sudan Heart Centre, Khartoum, Sudan. ◊King-Fahd Armed Forces Hospital, Jeddah, Saudi Arabia. §Ministry of Health and Social Services, Windhoek, Namibia. ΔUniversity of Washington, Washington, United States of America. +Ribat University Hospital, Khartoum, Sudan. **College of Medicine, Alribat National University, Khartoum, Sudan

Introduction: There are an estimated 33.4 million people living with rheumatic heart disease (RHD) globally, most of these reside in Africa. Although the condition has almost been eradicated in the global North, RHD persists as a significant public health concern in countries with high levels of poverty, socio-economic disparity and poor access to healthcare services. Existing research evidence compels us to take immediate action with regards to RHD control in Africa. Seven priority areas for action to eradicate RHD in Africa were identified at the 4th All-Africa Workshop on Acute Rheumatic Fever and Rheumatic Heart Disease (2016).

Methods: After these recommendations were endorsed and officially adopted by the African Union Commission (AUC) in the Addis Ababa communiqué, 7 action groups were launched with a mandate to develop principles for implementing RHD prevention and control programmes. We report the overall progress of these, highlighting the activities of each action group towards achieving specific objectives at country level.

Results: Through the action groups, the taskforce has successfully: (1) launched several RHD research projects across Africa, (2) developed data collection tools, e.g. the RHD Patient Management Tool to enable data capturing and routine patient management on a single platform, (3) conducted situational analyses which have highlighted important gaps in the availability of oral penicillin and BPG as well as barriers to proper administration in

African countries, (4) developed and published resources such as the taskforce position paper to guide health professionals on sexual and reproductive health in women with RHD and various other training resources for health workers and (5) provided grant support for advocacy activity focused on integrated multi-sectoral RHD prevention programmes across Africa.

Conclusion: We demonstrate the PASCAR RHD task force's progress but stress the importance of continued advocacy efforts and political will to prioritise RHD prevention and control in Africa.

Lessons from the Adolescents Receiving Continuous Care for Childhood-Onset Chronic Conditions (ADOLE7C) study: Transition of overage patients at a paediatric cardiology outpatient clinic

Liesl Zühlke[*,#], Alexia Joachim[*], Eloise Hendricks[#], Cameron Hendricks[*], John Lawrenson[*], Blanche Cupido[#], Ewa-Lena Bratt[†,‡], Bongani Mayosi[◊,**] and Philip Moons[*,§]

[*]Children's Heart Disease Research Unit (CHDRU), Department of Paediatrics, Red Cross War Memorial Children's Hospital, University of Cape Town, Observatory, South Africa. [#]Division of Cardiology, Department of Medicine, Faculty of Health Sciences, University of Cape Town, Observatory. [†]Institute of Health and Care Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden. [‡]Department of Paediatric Cardiology, The Queen Silvia Children's Hospital, Gothenburg, Gothenburg. Sweden. [◊,**]The Deanery, Faculty of Health Sciences, University of Cape Town, Groote Schuur Hospital, Observatory, South Africa. [§]Department of Public Health and Primary Care, KU Leuven, University of Leuven, Leuven, Belgium. [**]Deceased

Introduction: As part of the study, we aimed to identify over-age patients (>13 years) still in the care of the outpatient paediatric cardiac clinic, to thus review their clinical status and map their transfer and transition plans.

Methods: We identified all over-age patients in the outpatient cardiology service at Red Cross Hospital. Patients attend a designated adolescent clinic at which time they were reviewed for transitional care (preparation for transfer) or readiness for transfer to the grown-up congenital heart disease (GUCH) clinic.

Results: In the period 2017 to present, over 30% (n=343) of our outpatient paediatric cardiology service dealt with over-age patients whose ages ranged from 13 - 28 years. After a detailed review of each patient, patients were assigned in the following ways: 42% were still within the paediatric cardiology service, 22% were now formally transferred, 14% had been formally discharged, 2% were in shared care with the palliative service and 3% had died. Of note compared to patients born in 1991 - 1994, only 17% were lost to follow-up compared to over 80% previously recorded

Conclusion: As much as 30% of the patients attending our clinic was over-age. Transfer is viewed as a transitional process which includes preparation, review of clinical findings and then only transfer. Although only 22% of the patients have subsequently been transferred, we have instituted formal discharges and shared care which will improve outcomes for these patients.