Three dimensional speckle tracking imaging: a promising tool in the assessment of hypertensive heart disease

Sahar Ben Kahla Koubaa, Leila Abid, Faten Triki, Dorra Abid, Samir Kammoun
Hôpital Hédi Chaker, Sfax, Tunisie
*Corresponding author: saharbenkahlakoubaa@gmail.com (Sahar Ben Kahla Koubaa)

Introduction 3D speckle tracking imaging (3D-STI) is a new technique in the assessment of several heart diseases. We aim to delineate the effect of arterial hypertension (HTN) on left ventricle (LV) through a STI study.

Patients and Methods We studied 31 HTN patients and 30 age-matched healthy volunteers. The main exclusion criteria were atrial fibrillation, coronary artery disease, severe valvular heart disease or kidney dysfunction. Therefore, each subject underwent an echocardiogram with 3D-STI and serum NTproBNP was determined.

Results Among HTN patients, near 55% were women. Systolic and diastolic blood pressure were 149±6±17 and 89±10±8mmHg (vs. 119±7±17 and 77±6±6mmHg; p<0.0001). Mean LV mass was 116±19±2g which was significantly higher than healthy subjects (75±18±8g; p<0.0001). LV hypertrophy was predominantly concentric in 23 patients. Only 6 HTN patients had eccentric LV hypertrophy. NTproBNP was greater in HTN patients (31.3±13.9±1ng/ml; p=0.01). 3D LV peak longitudinal strain (3D-PSLG) was lower in HTN group (~14±2 vs. ~19±2; p<0.0001). PSLG was correlated significantly with age (R=0.38; p=0.032). There was a significant positive correlation between 3D-PSLG and E/Ea ratio (R=0.50; p<0.0001). In the other hand, both of them significantly higher than healthy subjects (75±18±8g; p<0.0001). LV hypertrophy was predominantly concentric in 23 patients. Only 6 HTN patients had eccentric LV hypertrophy. NTproBNP was greater in HTN patients (31.3±13.9±1ng/ml; p=0.01). 3D LV peak longitudinal strain (3D-PSLG) was lower in HTN group (~14±2 vs. ~19±2; p<0.0001). PSLG was correlated significantly with age (R=0.38; p=0.032). There was a significant positive correlation between 3D-PSLG and E/Ea ratio (R=0.50; p<0.0001). In the other hand, both of them were normal LV mass and relative wall thickness (RWT) were also associated with 3D-PSLG (R=0.60 and 0.74 respectively; p<0.0001). Multivariable regression analysis showed that RWT was the only factor strongly correlated to 3D-PSLG (β=0.54; p=0.002).

Conclusion: 3D-STI is a useful technique in the assessment of hypertensive heart disease. This study highlighted the relation between LV concentric geometry (RWT) and PSLG.

The author hereby declares no conflict of interest

Echocardiographic aspects of Congolese sickle cell disease heart disease

Louis Igor Ondze Kafata, Lydie Ngolet, Kivie Ngolo Letomo, Paterne Bakekolo, Thibaut Gankama, Gisele Kimbally-Kaky, Jospin Makani
CHU Brazzaville, Brazzaville, Congo
*Corresponding author: ondzeigor@hotmail.com (Louis Igor Ondze Kafata)

Introduction The cardiovascular complications are the major prognostic factor for Sickle cell disease (SCD).

Methods This was a descriptive cross-sectional study in the cardiology department of the University Hospital of Brazzaville. 79 patients, included by drawing lots from hematology department file of University Hospital center of Brazzaville, were compared to 73 non-sickle cell subjects. Echocardiographic data were collected and laboratory parameters: hemoglobin.

Results The 79 sickle cell patients were distributed in 48 women (60.8%) and 31 men (39.2%), mean age 27.0±9.9 years. The average hemoglobin was 7.8±2.9g/dl. We observed on echocardiography left ventricular dilatation in 12 patients (15.2%), right ventricular dilatation in 3 patients, left atrial dilatation in 34 patients (43.0%) and right atrial dilatation in 14 patients (17.7%). The ejection fraction of the left ventricle was on average 69±7±2%. Left ventricular hypertrophy was present in 68 patients (86.1%). We observed a normal mitral profile in 73 cases (92.4%). Pulmonary hypertension was found in 42 patients (53.2%). The comparison with non-sickle cell population showed a significant difference in favor of sickle cell on the left atrium (22.1 vs 14.1; p=0.001), the right atrium (16.9 vs 12.3; p=0.001), the left ventricle (35.0 vs 46.8; p=0.001), the right ventricle (21.2 vs 17.0; p=0.001), left ventricular mass (138.5 vs 80.0; p=0.001), cardiac output (7.4 vs 5.3; p=0.007) and the maximum flow velocity of tricuspid regurgitation (23.0 vs 19.6; p=0.001).

Conclusion Doppler echocardiography is an essential technic in the assessment of sickle cell patients. It enables the early detection of certain heart complications, especially pulmonary hypertension, making the prognosis of this disease.

Keywords sickle cell disease, echocardiography, pulmonary hypertension.

The author hereby declares no conflict of interest

Dobutamine stress echocardiography predicts the potential of myocardial recovery after revascularization in patients with acute myocardial infarction

Nadia Laredj*, Hadj Mohamed Ali Lahmar, Leila Hammou
CHU Oran, Oran, Algérie
*Corresponding author: ldj_nadia@yahoo.fr (Nadia Laredj)

Objectives After a myocardial infarction (MI), patients are at high risk for major cardiovascular events and should benefit from revascularization to recover the infarcted myocardium. The roles of dobutamine stress echocardiography (DSE) have been studied extensively in this indication. The aim of our study is to correlate the results of DSE with the potential for myocardial recovery after revascularization in our patients.

Methods It is a single-center prospective study on 146 patients with an acute coronary syndrome with ST segment elevation (STEMI), thrombolysis or not, admitted to the cardiology department since the beginning of September 2012 to the end of August 2013 and has undergone a pharmacological stress echocardiography with Dobutamine (DSE), an average of 4 weeks after the acute episode, and followed for a year.

Results Of 146 patients, the average age was 55±8 years, 85% men, 36% had hypertension, 41% were diabetic, and 31% had dyslipidemia. Thrombolysis was performed in 63% of patients. 58% of patients had an anterior myocardial infarction. The hospital stay averaged 8±3 days. The left ventricular fraction (LVEF) at stress estimated 48±2±6.8%. 89% of patients have benefited from coronary angiography (130 patients) including 3/4 had single or two- vessel disease. Cardiovascular mortality at 1 year was 3.1% (n=5), 19.2% of MI (n=28). Nearly three-quarters of patients who had a viability at DSE improved their LVEF at 1 year (p=0.004) with a high sensitivity (97.1%) and a good specificity (75%), and nearly two thirds had a viability at DSE improved their wall motion after revascularization (p=0.005).

Conclusion Dobutamine stress echocardiography predicts the potential for recovery after myocardial revascularization in patients with acute myocardial infarction.

Keywords myocardial infarction, dobutamine stress echocardiography, revascularization, viability, myocardial recovery.

The author hereby declares no conflict of interest

Feasibility and usefulness of cardiac magnetic resonance as a complement to echocardiography in the evaluation of heart failure with preserved left ventricular ejection fraction in elderly patients

Pierre-Laurent Massoure*, Charlotte Gabaoudan (1), Jean-Marie Gil (1), Marie-Caroline Chenilleau (1), Laurent Pouchade (1), Alexis Jacquier (2)
(1) Hôpital Laveran, Marseille, France – (2) APHM-CHU la Timone, Marseille, France
*Corresponding author: plmassoure@aol.com (Pierre-Laurent Massoure)

Objectives To evaluate the feasibility and usefulness of cardiovascular magnetic resonance (CMR) in the evaluation of heart failure with preserved left ventricular ejection fraction (HFpEF) in elderly patients.

Methods Patients aged 65 and older hospitalized for symptomat heart failure with a left ventricular ejection fraction (LVEF) >40% underwent both
CMR and 2D echocardiographic assessment of cardiac volumes, mass and function.

Results Among 14 patients (mean age 80.2±8.7 Y [66-91]), a good correlation was found between echocardiography and CMR for LVEF (56.7±8.1% vs 54.3±9.2%, r=0.8). Echocardiography mildly underestimated LV end diastolic volume (EDV) (55.6±25.8 vs 67±24.1mL/m²; r=0.84) and end systolic volume (ESV) (24.9±15.8 vs 31.3±13.9mL/m²; r=0.66). Echocardiography overestimated the LV mass (87.4±23.5 vs 64±22.3g/m²; r=0.5). Left atrial volume (assessed by CMR) was increased (52.8±24.9mL/m²), 8 patients had atrial fibrillation with larger left atrial volume (71.5±26.9 vs 38.8±10.9mL/m² for sinus rhythm, p 0.008). Right ventricular (RV) EDV and ESV assessed by CMR were normal. Mean RVEF was 43.7±8.7% and RVEF was <45% in 8 (57%) patients who also had lower LVEF (p=0.005) and higher pulmonary artery systolic pressure (p=0.01). Late gadolinium enhancement (LGE) was found in 8 cases, 4 with mid-wall LGE, 2 with subendocardial or transmural LGE and 2 with sub epicardial LGE.

Conclusion CMR was feasible, safe and was a useful complement to echocardiography in elderly patients hospitalized for HFpEF. In this population, LVEF assessed by CMR and echocardiography were comparable. Echocardiography underestimated LV volume and overestimated LV mass. Risk factors for adverse outcome such as RV dysfunction and the presence of LGE were found in more than half of the cases.

The author hereby declares no conflict of interest

0009
Cardiac involvement in hypereosinophilic syndrome: role of multimodality imaging
Blandine Simonnet (1), Alexis Jacquier (1), Catherine SportouDukhan (2), Erwan Donal (3), Erwan Salaun (3), Sandrine Hubert (3), Gilbert Habib (3)
(1) APHM-CHU la Timone, Marseille, France – (2) CHU Montpellier, Arnaud de Villemeuve, Montpellier, France – (3) CHU Rennes, Pontchaillou, Rennes, France
*Corresponding author: simblan@hotmail.com (Blandine Simonnet)

Cardiac disease occurs in more than 50% of patients with idiopathic hypereosinophilic syndrome; it is the major cause of morbidity and mortality in patients with this syndrome. The overall mortality is high if untreated. We aim to report recent experience in these cardiac diseases, especial echographic features and the contribution of multimodalities imaging.

This retrospective, descriptive and multicenter study reports the findings of patients in cardiac centers of Marseille, Montpellier and Rennes between September 2008 and March 2014. Echographic, MRI cardiac, coronarographic, PET CT, biology and histologic findings are reported. Seven patients have been reported. Echocardiography is the reference diagnostic method. Classical findings are progressive endomyocardial thickening, apical obliteration of one or both ventricles by echogenic material suggestive of fibrosis or thrombus formation, posterior mitral leaflet involvement and papillary dysfunction resulting in severe mitral regurgitation. These features are involved in embolic events or heart failure. MRI helps refine the diagnosis. The characteristic irreversible stage shows a circumferential thickened fibrotic sub endocardium with wall thrombi. The CT identifies non ischemic thrombus excluding coronary artery disease by coronary imaging. Coronary angiography may reveal fibrosis by the smoothed appearance of the ventricular walls and apical filling. PET CT shows general signs of myocarditis, such as myocyte necrosis, in the first stage of the disease.

Symptomatic treatment can lead to cardiac surgery (mitral valve replacement, resection of endomyocardial fibrosis). Each imaging technique plays a role in each of the three stages of the disease and the typical features of myocarditis, thrombus or fibrosis must be identified. Only seven cases of this rare disease have been identified in three french cardiac centers since 2008; this too small sample does not allow us to draw statistical conclusions.

The author hereby declares no conflict of interest

0563
Safety, feasibility and interest of transthoracic echocardiography in a deployed French military Ebola virus disease treatment center in Guinea
Gilles Rolland Cellarier, Julien Bordes, Raphael Poyet, Frédéric Pons, Eléonore Capilla, Christophe Jego
HIA Sainte Anne, Toulon, France
Corresponding author: gilles.cellarier@orange.fr (Gilles Rolland Cellarier)

Purpose Transthoracic echocardiography (TTE) for Ebola virus disease (EVD) might contribute to evaluate gravity, guide treatment, and finally improve prognosis and has not previously been described. This report delineates the safety, feasibility and clinical implications of systematic TEE for patients with EVD, in the setting of a deployed French military Ebola virus disease Treatment Center in Guinea.

Methods In first 48 hours after admission for EVD, a TTE was performed. All patients were monitored by continue video survey and radio call. Data were collected prospectively on all cases to include TTE hemodynamic parameters, and evaluate EVD cardiac complications. Data were collected by in-live oral transmission to medical center, and correlated to blood test variables including I-Troponin and Brain Natriuretic Peptide.

Result Eight consecutive patients, hospitalized in March 29th underwent TTE evaluation performed by a cardiologist during the first 48 hours of admission. Mean time in Personal Protective Equipment (PPE) was 82 min. No virus accidental exposition during procedure was deplored. TTE were feasible for all patients and all parameters could be studied. All TTE showed signs of hypovolemia with low LV pressure filled despite 2 patients with dyspnea; 1 patient had pericarditis effusion (with inappropriate sinus bradycardia and elevated troponin), and 1 had previous aspect of ischemic cardiomyopathy with conserved left ventricular ejection fraction (LVEF).

Conclusion Early use of TTE in Ebola virus disease is safe, effective and facilitates patient care. It should be considered a feasible additional exam, where physician expertise and resources allow. In our study, contrary to the hypotheses previously made, dyspnea had a non-hemodynamic origin (figure next page).

The author hereby declares no conflict of interest