Conclusion: The data indicate nearly 1/3rd of population are at risk. The urban population is at higher risk than rural (p < 0.001). This data has social relevance for strategic planning at population level to prevent ACS.

Results of a comprehensive coronary heart disease prevention program in South India

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Objective: Coronary heart disease (CHD) is a major cause for mortality and morbidity among Indians. However, the focus on lifestyle measures in the prevention of CHD in the country is abysmally low. We aimed to analyse the outcomes of a comprehensive CHD prevention/rehabilitation program in South India.

Methods: All patients enrolled between May 2014 and April 2015 with established CHD (n = 32) or with documented risk-factors and no CHD (n = 28) were included in the study. Patients attended 1–2 sessions per week for 6–12 weeks. Each session lasted 90–100 min and included an exercise component and an education/counselling component on diet, activity, compliance to therapy, risk-factor modification and psychosocial aspects. Apart from clinical and family history, resting heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), body mass index (BMI), waist–hip ratio and functional capacity using treadmill test (TMT) or 6 min walk test (6MWT) were documented before (pre) and after (post) the program. Adherence was considered good if a patient attended >50% of the sessions enrolled and poor if ≤50%. Fischer’s exact test and student’s t-test were used to compare categorical and continuous variables respectively; p value < 0.05 was considered statistically significant.

Results: Subjects with CHD were older (61 ± 10 years vs 50 ± 15 years, p = 0.002), predominantly males (84% vs 57%, p = 0.02), showed better adherence (84% vs 61%, p = 0.046) and attended more sessions (11.1 ± 6.4 vs 6.9 ± 3.6, p = 0.03) than non-CHD subjects. In the CHD group, medical therapy was documented in all (100%), CAGB in 4 (12%), PTCA in 3 (9%) and heart failure in 5 (16%) subjects. Among all (n = 60) enrolled subjects, 37 (62%) completed their program and 23 (38%) could not complete due to various reasons. Post-program evaluation showed significant improvement in cardiac symptoms, BMI, SBP and functional capacity (Table 1). The 6MWT seems to be an efficient and reliable tool for functional capacity assessment in our setting.

Conclusion: Cardiac rehabilitation, a key component in the management of CHD, is under-utilised in India. This study shows that an exercise-cum-education program has significant benefits in a South Indian cohort and can potentially be incorporated in the routine management of all patients with (risk of) CHD.

Table 1 – Outcomes of the CHD prevention program.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Pre-program (n = 37)</th>
<th>Post-program (n = 37)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort angina, n (%)</td>
<td>8 (22)</td>
<td>1 (3)</td>
<td>0.03</td>
</tr>
<tr>
<td>Heart rate (bpm)</td>
<td>77 ± 11</td>
<td>75 ± 14</td>
<td>0.44</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>135 ± 16</td>
<td>127 ± 13</td>
<td>0.03</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>78 ± 10</td>
<td>81 ± 9</td>
<td>0.16</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>27.2 ± 5.8</td>
<td>26.9 ± 5.7</td>
<td>0.01</td>
</tr>
<tr>
<td>WHR</td>
<td>0.99 ± 0.05</td>
<td>0.98 ± 0.04</td>
<td>0.79</td>
</tr>
<tr>
<td>Functional capacity*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6MWD (m, n = 29)</td>
<td>416 ± 120</td>
<td>488 ± 143</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TMT, METS (n = 6)</td>
<td>6.1 ± 1.9</td>
<td>7.8 ± 1.9</td>
<td>0.047</td>
</tr>
</tbody>
</table>

* Functional capacity could not be evaluated in 2 patients.

Burden of cardiovascular risk in young, apparently healthy individuals in the Indian sub-continent: Time for intervention?

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Purpose: The majority of sudden cardiac deaths (SCD) are attributed to atherosclerosis and affect the older section of the population. Ischaemic heart disease in India accounts for 61,000,000 deaths per year, despite the youth of its population, with 65% of individuals aged <35 years. Although a high prevalence of cardiovascular risk factors in the young appears the most plausible explanation, there are no supporting data. The study aimed to define the prevalence of cardiovascular risk factors & quiescent heart disease in a cohort of young, apparently healthy Indians.

Methods: A cohort of 751 consecutive individuals (69% male) with a mean age 21 years (range 15–40 years) underwent screening with a health questionnaire relating to cardiac symptoms, cardiovascular risk factors and family history of cardiovascular disease or premature (<40 years) SCD and physical examination. All participants underwent a blood pressure (BP) measurement, capillary blood glucose, lipid profile analysis and 12-lead ECG. Individuals with ECG anomalies or a murmur underwent transthoracic echocardiography on site. All participants received life style modification advice. Individuals with abnormal results were referred for further investigations as per local protocols.

Results: During initial evaluation 63 (8.4%) individuals demonstrated a positive finding; 20 (2.7%) had elevated total cholesterol levels defined as >6 mmol/l, 13 (1.8%) had elevated BP defined as systolic BP >140 mmHg and 15 (2%) had elevated fasting glucose levels defined as >7 mmol/l. Echocardiography was performed on 15 (2%) individuals who exhibited a cardiac murmur or an abnormal ECG. Echocardiography revealed moderate mitral stenosis (n = 4), mild aortic stenosis (n = 3) and hypertrophic cardiomyopathy (n = 2). An additional 9 (1.2%) individuals were classed as obese (BMI > 30). On follow-up, all diagnoses were confirmed by respective physicians and individuals received treatment and follow-up as appropriate.

Conclusion: Our results indicate a high burden of cardiovascular risk factors and quiescent heart disease in an unselected population of young Indians. This is in excess of what is reported in Caucasian populations and the most plausible explanation for the high cardiovascular morbidity and mortality in the Indian sub-continent. A large-scale population screening program is likely to identify a considerable proportion of young individuals at risk, however, its feasibility and cost-effectiveness remains to be defined.

Study on clinical profile of metabolic syndrome in elderly and its relation with highly sensitive C-reactive protein (hs CRP)

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Background: Highly sensitive C-reactive protein as a marker of systemic inflammation and the contribution of individual components of metabolic syndrome to elevated C-reactive protein was studied in elderly (>60 years) individuals.

Objectives: To study the prevalence of various components of Metabolic Syndrome in elderly patients. Association of individual components of metabolic syndrome with highly sensitive C-reactive protein.

Methods: Elderly subjects who were aged 60 years or more and attending the hospital and satisfying at least 3 of the 5 components of metabolic syndrome according to the revised NCEP ATP III criteria of metabolic syndrome were included in the study. All the patients underwent detailed history and physical examination. Anthropometric data like height, weight, waist circumference were collected, BMI calculated with Quetelet index formula. The quantitative determination of hs CRP was done by immune turbidometric assay by MODULAR P automated analyzers (Roche).

Results: Among 100 elderly patients hypertension was prevalent in 93%, elevated waist circumference 84%, diabetes mellitus 81%, low HDL cholesterol or using lipid lowering drugs in 81% and elevated triglycerides or h/o using lipid lowering drugs in 75% of the study group. Highly sensitive C-reactive protein was elevated in 60% of the study group. hs CRP was more elevated in those patients with hypertension and elevated waist circumference than the other components of metabolic syndrome. Higher the number of the risk factors in an individual patient higher the elevation of hs-CRP.

Conclusions: Our study concluded that among all components of metabolic syndrome, hypertension and visceral adiposity were observed more frequently than the occurrence of other components in this elderly cohort of South India. Elevated waist circumference and hypertension were most commonly associated with systemic inflammation as measured by elevated hs CRP.

Prediction of coronary artery disease severity using newly defined scoring system CHA2DS2-VASc-HSF score

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Introduction: The CHADS2 score is a clinical predictor of the risk of stroke in patients with nonvalvular atrial fibrillation used to determine whether anticoagulation or antiplatelet therapy is required. In clinical use, the CHADS2 score has been replaced by the CHA2DS2-VASc score, which provides better stratification of low-risk patients. Both the CHADS2 and CHA2DS2-VASc scoring schemes are easily remembered and applied by physicians in clinical practice. As they include similar risk factors for the development or presence of coronary artery disease (CAD). They could also be used to predict CAD severity. A new formulated score, termed the CHA2DS2-VASc-HSF score could be used for determining CAD severity. This scoring system includes hyperlipidemia (HL) and smoking as other major risk factors for CAD, in addition to using male rather than female gender and Family history.

Objective: To assess CHADS2, CHA2DS2-VASc, CHA2DS2-VASc-HSF scores as multivariable risk assessment tools to identify those at high risk of severe CAD in patients who underwent diagnostic coronary angiography (CAG).

Methods: This was a single-center study of 2976 consecutive patients who were admitted for diagnostic CAG were prospectively enrolled. All study patients were referred with symptoms suggestive of CAD and/or abnormal noninvasive stress tests based on exercise electrocardiographic testing or myocardial perfusion imaging test. Initially, all angiograms were evaluated in terms of coronary stenosis and assessed the Gensini score. Thereafter, CHADS2, CHA2DS2-VASc and CHA2DS2-VASc-HSF scores were calculated.

Results: The study population consisted of 2976 patients of whom 804 had normal coronary arteries and were selected as the control group (group 1). The remaining 2172 patients with coronary stenosis were further classified into 2 groups: 834 patients with CAD with stenosis of <50% as mild CAD group (group 2) and 1338 patients with CAD with stenosis of >50% as severe CAD group (group 3).

Conclusion: The major findings of the present report were
1. The CHADS2, CHA2DS2-VASc and CHA2DS2-VASc-HSF risk scores were increased in patients with mild and severe CAD
2. The CHADS2, CHA2DS2-VASc and CHA2DS2-VASc-HSF scores were correlated significantly with the number of diseased vessels and Gensini score, and
3. The CHA2DS2-VASc-HSF score was found to be the best score scheme to predict CAD severity and a score >3 may predict CAD severity.

A study to derive distribution of CIMT and to determine its correlation with cardiovascular risk factors in asymptomatic nationwide Indian population

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Objectives: To obtain distribution and correlates of CIMT in subjects without CVD. Further, the study also explored the association of CIMT values with demographics characteristics and CVD risk factors respectively

Method: Study included 1229 subjects from 15 sites across India. Study captured demography, medical history, concomitant medication, physical examination and laboratory investigations (CIMT, ECG, FPG, Lipid profile and microalbuminuria). CIMT values were evaluated centrally based on the age group, gender and risk factors of the subjects

Result: Study recruited 1229 subjects with mean age 48 years, 54.2% of male with mean BMI of 26.0 kg/m². The vital parameters were within the desired range with SBP, DBP and HR at 124.8 mmHg, 77.7 mmHg, and 74.9 bpm respectively. Results for CIMT values in study population are given in Table 1. At the 10% level of significance, the forward selection method chose age, systolic BP, triglycerides and LDL-cholesterol as the significant independent variables to be included in the multivariate regression analysis. The respective p-values were <0.0001 for the age and systolic BP; while p value was 0.0014 for the triglycerides and 0.0864 for the LDL cholesterol, respectively

Conclusion: The study results provide normal distribution of CIMT in Indian asymptomatic subjects in first of its kind large nationwide study. This will prove a critical baseline information to do further research in this area.