Correspondence

Predictors of obstructive coronary artery disease in women

Sir,

We recently came across a very interesting article published in the Indian Heart Journal- "Development of a diagnosis model for coronary artery disease" by Hongzeng Xu et al.[1]. It was a retrospective multi-centric study, in which authors have evaluated risk factor and angiographic profile of 7360 Chinese patients with suspected coronary artery disease (CAD). Using this data, they developed a prediction model including age, sex, and cardiovascular risk factors that was found to be highly accurate for the estimation of the pre-test probability of coronary artery disease.

CAD continues to be the leading cause of death in both men and women worldwide.[2] However, CAD in women presents a unique and complex challenge to the clinicians. They often have larger symptom burden and more atypical presentation, yet lower rates of obstructive CAD compared to similarly aged men.[3] Exercise ECG stress test has a very limited accuracy in women especially because of the resting ST-T wave changes, lower ECG voltage and certain hormonal factors. Similar to TMT, other common observations like electrocardiographic changes, myocardial perfusion defects, and regional wall motion abnormalities have limited predictive value in women undergoing evaluation for CAD.[4] Furthermore, the use of CT coronary angiography is limited and expansive especially in a developing country like India. Coronary angiography (CAG) continues to be the gold standard investigation for diagnosis of obstructive CAD. But whether we can recommend it as a first line investigation to all the women presenting with chest pain, especially those with atypical chest pain- the answer is definitely 'No'. This is because CAG is an invasive modality with inherent risk of complications. Although generally considered safe, death and procedural myocardial infarction can occur as complications in 0.1% patients.[5] Vascular site complications are more frequently observed in as high as 8% patients depending upon the operator's expertise, and occur more frequently in women.[5] Therefore for all these reasons, it is imperative to identify the predictors of obstructive CAD in women before they undergo invasive coronary angiography.

With this aim, we conducted a prospective study in 674 consecutive female patients with suspected CAD, who underwent coronary angiography in our institute over a two years' period (2015–2016). Risk factor profile and angiographic pattern of disease were recorded systematically in each patient. Obstructive CAD was defined as the presence of at least one major epicardial coronary artery with 50% or more narrowing of the luminal diameter. Patients were divided into 2 groups, with and without obstructive CAD, and were compared. Using multivariate logistic regression analysis, we were able to identify a few independent predictors/determinants of CAD in these patients. These included:

1. Age >55 years; OR(95%CI) = 3.41 (2.29–5.10)
2. Typical angina; OR(95%CI) = 15.75 (8.06–30.78)
3. Smoking; OR(95%CI) = 15.28 (6.27–37.21)
4. Diabetes; OR(95%CI) = 2.60 (1.68–4.03)
5. HDL-cholesterol <40 mg/dl; OR(95%CI) = 4.54 (2.71–7.57)
6. LDL-cholesterol >150 mg/dl; OR(95%CI) = 3.94 (1.95–7.96)

Where, [OR(95%CI)] = [Odds ratio (95% confidence interval)].

Interestingly, positive family history of premature CAD, postmenopausal status, presence of hypertension, overweight/obesity and a positive exercise ECG stress test did not independently determine the presence of obstructive CAD on multivariate analysis. However, sample size of 674 patients in our study was relatively small. Furthermore, we did not test the novel risk factors like serum Lipoprotein(a), high sensitivity C-Reactive protein, serum homocysteine, and serum triglycerides. We need larger prospective studies from different cultural, ethnic and social backgrounds to validate these results and identify the predictors of obstructive CAD in women. Identification of such predictors would help us in developing prediction models, like the one by Hongzeng Xu et al.[1]. This would translate into avoidance of many unnecessary angiograms.

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Obesity in adult asian indians- the ideal BMI cut-off

Sir,

We recently came across a very interesting review article published in the Indian Heart Journal- "Management of obesity in adult Asian Indians" by S. Behl, et al..[1] In an exhaustive review, authors have discussed the characteristics, diagnostic criteria and evaluation of obesity in Asian Indians. They have also elaborated the preventive and treatment strategies to combat this increasingly important health problem in India and worldwide.

Recent data show that in India, almost 13–50% of the urban population and 8–38% of the rural population suffers from obesity.[1] The rising prevalence of overweight and obesity in India has resulted in an increased prevalence of obesity-related co-morbidities; hypertension, the metabolic syndrome, dyslipidemia, type 2 diabetes mellitus, cardiovascular disease, non-alcoholic fatty liver disease, obstructive sleep apnea, and certain cancers.[2] In view of the rising trend in prevalence of obesity and related metabolic diseases, and the financial burden they impose, effective interventions are needed for Asian Indians immediately. It has been repeatedly demonstrated that the Asian Indians manifest clustering of cardiovascular risk factors and T2DM at lower levels of body mass index (BMI) in comparison to the age-matched white Caucasians.[1,2] The former characteristically have greater total, truncal, intra-abdominal, subcutaneous, and ectopic tissue fat at a given level of BMI than the latter.[2] Prompted by similar data from several studies, a World Health Organization (WHO) expert group in 2000, proposed BMI criterion for overweight as 23–24.9 kg/m^2 and that for obesity as $\geq$25 kg/m^2 for people residing in the Asia-Pacific region.[3] However, WHO did not accept these criteria and continues to define overweight as BMI $\geq$25 kg/m^2 and obesity as BMI $\geq$30 kg/m^2 universally. Subsequently, this issue continued to be debated, so in 2004 the WHO decided not to take any firm actions on this issue and left to the governments of respective Asian countries to take a decision on the guidelines for BMI.[4] WHO, however, added the cut-off points of 23 kg/m2 and >27.5 kg/m2 as the points for moderate-risk and high-risk public health action.[4] Finally, In 2009, more than 100 Indian medical experts representing reputed medical institutions, hospitals, government-funded research institutions, and policy-making bodies participated to develop Asian Indian-specific guidelines for defining and managing overweight and obesity. The consensus guidelines defined overweight as those with BMI between 23.0–24.9 kg/m^2 and obesity as those having BMI $\geq$ 25.0 kg/m^2.[5]

Unfortunately, despite having clear cut Indian guidelines for defining overweight and obesity since 2009, the majority of contemporary studies and physicians in India are still using the international criteria for overweight and obesity. Majority still define obesity as BMI either $\geq$27.5 kg/m^2 (WHO 2004) or $\geq$30 kg/m^2 (WHO universal cut-off). This has serious health implications. This has led to many Indian individuals labelled as non-obese, despite being truly obese according to the consensus guidelines, thereby putting them at the risk of developing diseases associated with obesity. These misperceptions could also impede weight-loss efforts because accurate self-perception of overweight and perceived personal health risk are necessary precursors to weight-loss attempts. It is believed that if preventive and therapeutic modalities are applied at lower levels of BMI and obesity, nearly 15% of the adult population of India (nearly 5–7 crore people) will benefit and diabetes mellitus and cardiovascular diseases could be prevented in them.[5] So we strongly urge the researchers and physicians all across the country to adopt the Indian consensus guidelines and definitions for overweight and obesity.[5] This would translate into an accurate measurement of the disease burden across the country and help in the formulation of context-specific preventive and treatment strategies to combat the rise of this rapidly growing non-communicable disease.

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Author's contribution

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