ABSTRACT

Coronary artery disease (CAD) is the most common cause of morbidity and mortality especially in the developing countries. Coronary artery measurements (CAM) are the most important factor that affects the procedure and outcome of coronary angioplasty (PCI) as well as coronary by-pass operations (CABG).

The present study was aimed to study the coronary artery vessel size with and without myocardial bridging (MB) and its association with other pre-selected factors which can predispose for CAD among South Indian population. The objectives of the study were, to assess the normal coronary vessel morphology, to validate if gender-specific difference exists among CAM and to find possible association of body mass index (BMI) with normal coronary dimensions. The distributions of diseased and non-diseased coronary arteries among normal and bridged coronary arteries were assessed. The associations between cardiac dominance and CAD among each pattern of dominance were also studied. In order to get the correct representation of the South Indian population, i.e., the states of Kerala, Karnataka, Tamil Nadu and Telangana were included for data collection. Four thousand angiograms of patients of Indian origin and from the respective state were studied prospectively after procuring the sanction for the same from the ethical committee of the pre-selected hospitals from the four states. Informed consents were obtained. Patients with congenital heart disease, rheumatic heart diseases and cardiomyopathies were excluded. Post CABG, post PCI patients and patient being diabetic for ≥5 years were also excluded from the study. Ten segments of the coronary arteries were taken for diameter measurements namely, LMCA, LAD (O, P), DIAG, LCx (O, P), OM, RCA (O, P), RAM. These coronary diameters were indexed (adjusted) to body surface area (BSA) (mean diameter mm/m²BSA). This helped to avoid the possible bias induced by BSA on the CAM. BMI and BSA of the patients were calculated after assessing height and weight of the study subjects. Angiogram study categorisation of 4,000 patients revealed that 933 (23.3%) had normal coronaries and 3,067 (76.7%) had diseased coronary arteries.
Among normal sample population, there were 521 (55.9%) males and 412 (44.1%) females. Mean age of the patients was 54.50 ± 8.45 years (range 30–75 years). Mean BMI was 24.59 ± 1.48 kg/m² (range 31.30–21.26 kg/m²) and mean BSA was 1.75 ± 0.11m² (range 1.36–1.99 m²). The dimensions of the coronary artery segments were smaller (in both BSA indexed and non-indexed data) of the present study, compared to studies from other continents. Smaller size coronary artery in Indians can be due to their smaller BSA. In general, the CAM was bigger among male patients compared to females for both left and right coronary systems in the present study. Present study concludes that with increase in BMI, there was a relative decrease in coronary artery diameter. 

When bridged segments of the present study were assessed individually, it was found that the stenosis involvement in the bridged segments were minimal with increased differences between artery diameter in diastole and systole. The correlation of bridged segments to CAD was assessed by calculating the percentage of bridging in the involved artery. Significant association was found between stenosis involvement and percentage of bridging was found in the present study. The present study concludes that the stenosis prevalence was more for left dominant patterns (DP), followed by right DP and least for co-dominant patterns. A significant association was found between the diameters of the LCx-p and RCA-p and the type of coronary vascular distribution.

**Abbreviations:** CAM- Coronary artery measurements, CAD- Coronary artery disease, CABG- Coronary artery bypass graft, PCI- Percutaneous coronary interventions, Myocardial bridging (MB), LMCA - Left main coronary artery, LAD (O, P) - Left anterior descending artery (Ostium, Proximal part), DIAG - Diagonal branch of LAD, LCx (O, P) - Left circumflex coronary artery (Ostium, Proximal part), OM - Obtuse Marginal branch of LCx, RCA (O, P) - Right coronary artery, (Ostium, Proximal part), RAM – Ramus branch of coronary artery, Body mass indexes (BMI) and body surface area (BSA), DP- Dominance pattern.