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CORONARY ARTERY DIMENSION IN INDIAN POPULATION

Cardiology

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ABSTRACT

Background: Coronary artery diameter is an important predictor of outcome after coronary interventions.There is very limited data available about coronary artery dimensions in an Indian population. **Aim:** To study the normal dimensions of the coronary artery segments in Indians without coronary artery disease by using quantitative coronary angiography. **Material and method:** 100 patients who have undergone coronary angiography with entirely normal coronary angiogram were included in our study. **Results:** This study showed the left main was larger in size followed by proximal LAD, proximal RCA & proximal LCX respectively (4.08 ± 0.44 mm, 3.27 ± 0.23 mm, 3.20 ± 0.37 mm, 2.97 ± 0.37 mm).When the vessel diameter was indexed to body surface area there was no statistical difference between males and females (p value > 0.05). Caucasians have larger coronary artery dimensions than Indians. But the vessel diameter indexed to body surface area showed no statistical significant difference between Indians and Caucasians (p value > 0.05).**Conclusion:** We found that coronary artery size indexed to body surface area is not statistically different between Indians and Caucasians. However with a smaller body habitus, Indians have smaller coronary arteries.

KEYWORDS

coronary interventions, quantitative angiography, proximal diameter, body surface area

Introduction:

Coronary artery size is an important predictor of outcome after percutaneous coronary interventions (PCI) and coronary artery bypass surgery (CABG). Age, sex,anatomic variation,body mass index and left ventricular hypertrophy influence the coronary artery dimensions[1,2].

Literature Survey:

Only limited data is available about coronary artery dimensions in an Indian population.In a study done by Raut et al in 2017, Indians had smaller coronary artery dimensions compared to Caucasians. Similar results were noted in a study done by Elangovan et al in 2005[3,4].

Aim:

To study the normal dimensions of the coronary artery segments in Indians without coronary artery disease by using quantitative coronary angiography.

Methodology / Approach:

We studied 100 patients, who had normal coronary angiogram based on visual assessment. Patients with history of diabetes mellitus, hypertension, renal disease, valvular heart disease were excluded. The dimension of the coronary artery was then measured with reference to the catheter diameter by QCA. The measurements were taken in diastole[4,5]. Each artery was measured in the defined segments and measurements taken of the widest diameter of the segment (). The statistically significant p value in all these tests was assumed at a value < 0.05.

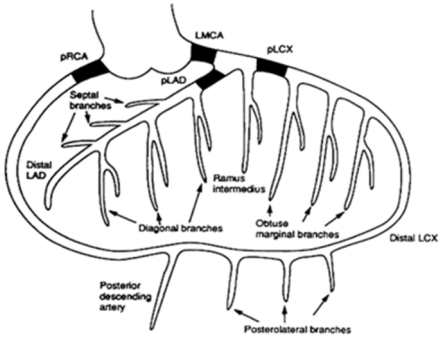

Fig.1. Coronary artery map- darkened area taken for reference diameter. [LMCA: Left Main Coronary Artery. PLAD: Proximal Left Anterior Descending Artery (before 1st septal branch). PLCX: Proximal Left Circumflex Artery (before 1 st obtuse marginal). PRCA: Proximal Right Coronary Artery (before 1st acute marginal)].

Results & Discussion:

We studied 100 patients out of which 46 were males and 54 were females. Mean age of the patients was 52.3. Average BMI was 23.59kg/m^2). Mean body surface area was 1.65m^2.The right coronary artery was dominant in 61.83%, with co- dominance in 21.14% and left dominance in 17.03%. When the diameter of vessels in males and females was taken together the left main was largest in size followed by proximal LAD, proximal RCA & proximal LCX respectively (4.08± 0.44 mm, 3.27 ±0.23 mm,3.20± 0.37 mm, 2.97± 0.37 mm).

The size of proximal segments of coronary system was larger in males compared to females without reference to the BSA (). Our study showed that when the size of the vessel, was indexed to the BSA, there was no statistical significant difference between males and females (p value > 0.05) (). The diameter of proximal coronary segments of our study, unadjusted for BSA, when compared to Caucasians, showed statistical significant difference with Caucasian arteries being larger(p value < 0.05)[6,7]. However when indexed to BSA, the size of the proximal coronary system was not statistical significant different between

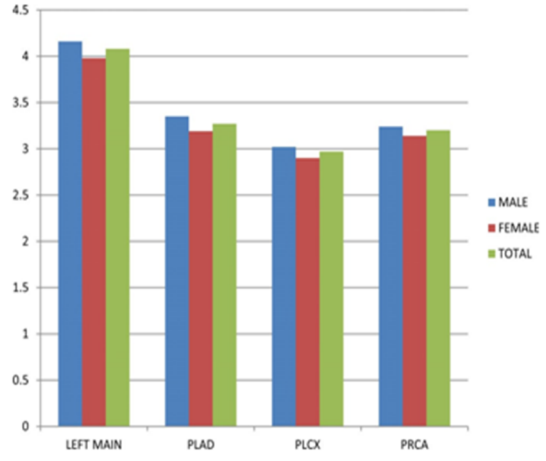

Chart 1. Coronary artery dimensions (in mm) in both sexes. (Left main artery, PLAD- proximal left anterior descending artery, PLCX- proximal left circumflex artery, PRCA- proximal right coronary artery).

Indians and Caucasians[8] (Table 2).

Table 1

Coronary artery diameter indexed to body surface area: When the size of the vessel when indexed to body surface area, there was no statistical significant difference between males and females (p value > 0.05).

Coronary artery	MALE	Female	Total	p value
Left main	2.34 ± 0.28	2.33 ± 0.27	2.34 ± 0.28	>0.05
PLAD	1.88 ± 0.17	1.86 ± 0.20	1.87 ± 0.21	>0.05
PLCX	1.70 ± 0.22	1.69 ± 0.23	1.70 ± 0.23	>0.05
PRCA	1.82 ± 0.22	1.83 ± 0.21	1.83 ± 0.22	>0.05

PLAD- proximal left anterior descending artery, PLCX- proximal left circumflex artery, PRCA- proximal right coronary artery.

Conclusion:

The indexed size of coronary arteries in Indian males and females is the same.We found that coronary artery size indexed to BSA was not statistically different between Indians and Caucasians. Indians have small size coronary artery because of their smaller body surface area.

Future Scope:

Coronary artery dimensions measured using IVUS and OCT can provide more accurate values. Large scale studies are needed to further establish our results. Further studies in patients with diabetes mellitus or systemic hypertension can also provide valuable data for improving coronary interventions.

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