

# FREQUENCY OF CORONARY ARTERY DILATATION – ANEURYSM AND ECTASIA – IN PATIENTS UNDERGOING CORONARY ARTERIOGRAPHY

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**Objective:** Coronary artery dilatation-ectasia and aneurysm- are frequently unrecognised incidental finding on coronary arteriography in-patient with coronary artery disease. Due to scarcity of local data ,the study was conducted in patients underwent for coronary arteriography.

**Study design:** Cross-sectional study.

**Methods:** This study was conducted on 200 patients admitted for coronary syndrome in cardiology unit from January 2011 to May 2012 and under went for coronary arteriography. Patients were labelled as having ectatic (diffuse) and aneurysm (localized) vessels if coronary arteries had a luminal dilatation > 1.5 fold the diameter of the normal adjacent arterial segment on coronary arteriogram respectively.

**Results:** Total of 200 patients, 147 (73.5%) were male and 53(26.5%) were female. The mean age was  $39.4 \pm 5.46$  and range from 27 - 65 years. Coronary artery dilatation was found in 25 (12.5) patients.

Male to female ratio was 2.7:1. Majority were young patients in the age range from 35-46 years ,and mean age 37+ 5.

Co-existence significant coronary artery disease was seen in 90.2% of patients . 72.5% patients had dilatation of the right t coronary artery while 65.5% patients had stenosis of left anterior descending coronary artery.

**Conclusion:** Coronary artery dilatation is an incidental arteriographic finding. It was more common in male and young patients.Co-existent significant coronary artery disease was seen in 90.2% of patients .Dilatation of right coronary artery while stenosis of left anterior descending coronary artery was seen in majority of patients.

**Key words:** Coronary artery dilatation, Arteriography, Coronary ectesia.

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## INTRODUCTION

Coronary artery dilatation (aneurysms - ectasia) characterized by an abnormal dilatation of coronary artery. Aneurysms mean localized dilatation (>1.5 time) of adjacent segment. Ectasia mean diffuse (> 50 of vessel) dilatation (>1.5 times) of adjacent segment.<sup>1</sup> First description of coronary artery aneurysms was attributed to Morgagni in 176<sup>1,2</sup> while Munker etal. report the

first case of antemortem.<sup>3</sup> Reported frequency of coronary artery aneurysms range from 0.3 to 5%.<sup>4</sup> <sup>5</sup> In CASS registry it was 4.9%.<sup>6</sup> Prevalence of coronary artery ectasia was reported in range from 2 to 12%.<sup>7-9</sup> Etiopathogenesis varies with geographic location and age. Common etiologies are atherosclerosis at site of coronary intervention congenital, infections Kawasaki disease and herbicides. The herbicides containing acetylcholine sterase inhibitors could directly increase the levels of acetylcholine. Acetylcholine is one of the known potent stimulators of nitric oxide, the endothelium-derived relaxation factor(EDRF).<sup>16</sup> Herbicides may therefore be

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responsible for elevated levels of nitric oxide at various regions of the coronary interstitium. Nitric oxide stimulates the relaxation of vascular smooth muscle via the guanylate cyclase pathway and release of calcium from the endoplasmic reticulum. Intimal damage and medial disruption is common pathogenesis.<sup>10-12</sup> Multidetector computed tomography, intravascular ultrasound and coronary arteriography are major diagnostic tools for diagnosis.<sup>13</sup> Well-established treatment plan is not available. Aim of treatment is to prevent complication and improve symptoms. It include risk factors modification, avoidance from precipitating factors, anticoagulation to offset risk of thrombus formation, antiplatelet therapy, antispasm therapy with calcium blocker  $\pm$  nitrates, coronary intervention and CABG.<sup>14</sup> Coronary artery dilatation is more frequent in young man and commonly involves right coronary artery.<sup>15</sup> It is associated with acute coronary syndrome in 1/3 of patients.<sup>16</sup> Due to high mortality and increasing prevalence of coronary artery dilatation, a study was conducted to determine the frequency in patients under-going coronary arteriography.

## METHODS

This cross-sectional study was conducted on 200 patients admitted with coronary syndrome in cardiology unit from January 2011 to May 2012 for coronary arteriography. Patients were in age range between 27 to 65 years. Both male and female were included in study. Patients who have history of contrast medium allergy, renal failure, congestive heart failure, coagulopathy, refractory hypertension and congenital heart disease were excluded. Coronary artery was labelled ectatic when there is diffuse dilatation( $>1.5$ ) involving more than 50% of coronary artery while aneurysms when there is localized dilatation( $>1.5$ ) of coronary artery. Coronary obstruction was considered significant, when there is 50% luminal obstruction. Under aseptic measures, right femoral sheath (6 French) passed and coronary arteriography performed by taking standard views with flat panel angiography machine. Coronary

arteriogram was recorded on digital imaging system for review and retrieval. Coronary arteriograms were reviewed and proforma filled. Data was analyzed by SPSS.8 software for frequency, percentage and mean $\pm$ -SD.

## RESULTS

Total of 200 patients, 147 (73.5%) were male and 53(26.5%) were female. The mean age was  $39.4 \pm 5.46$  and range from 27 - 65 years. Coronary artery dilatation was found in 25 (12.5) patients. Male to female ratio was 2.7:1. Majority were young patients in the age range from 35-46 years, and mean age 37. Co-existence significant coronary artery disease was seen in 90.2% of patients. 72.5% patients had dilatation of the right coronary artery (Table-1) while 65.5% patients had stenosis of left anterior descending (Table-2) coronary artery.

**Table-I:** Percentage of Coronary artery dilation

Artery	Percentage
RCA	72.5%
RCA +LAD	13.5%
LCX	09%
LAD + LCX	5%

**Table-II:** Percentage of coronary artery stenosis

LAD	65.5%
RCA	22.5%
LCX	8%
LM	0.9%
RAMUS	3.1%

**Fig.1:** Showing Ectasia Of Proximal LAD



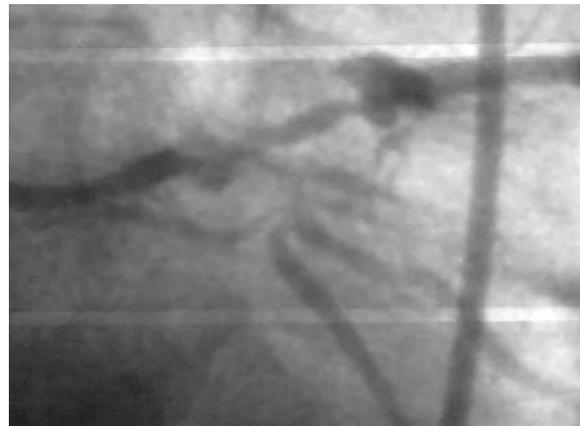
**Fig. 2:** Showing Aneurysm Of Proximal LAD



**Fig.3:** Showing Ectasia of proximal LAD and LCX



**Fig.4:** Showing Aneurysm of LAD and Stenosis of LCX



**Fig.5:** Showing ectasia and stenosis LAD\



**Fig.6:** Showing ectasia and aneurysm of RCA



## DISCUSSION

There are various modalities for diagnosis and follow up of coronary artery ectasia. Due to non-availability of equipments and expert personal, their use is limited. Therefore conventional

coronary angiography is still gold standard. In a study conducted in Singapore by Lam CSet al<sup>17</sup> analyzed eight thousand six hundred and forty-one patients who underwent coronary angiography. Of these, 104 patients were found to have CAE. This gave an incidence of 1.2%. In a study by Kahraman H et al<sup>18</sup> coronary angiograms of 1,565 consecutive patients were prospectively analyzed. The overall incidence of CAE was 5.1%. A study by Altinbas A et al<sup>19</sup> analysed coronary angiograms, and he found the overall incidence of CAE 6.7%. In a study by Zeina AR<sup>20</sup> 400 consecutive participants in whom incidence of CAE was %. Sharma SN et al<sup>21</sup> from India analysed coronary angiographies in 125 young patients {below 40 years, mean age 37.3 years} with clinical evidence of ischaemic heart disease and compared it with 125 older patients with ischaemic heart disease {more than 40 years, mean age 52.8 years} in the same period. Coronary artery ectasia was observed in 13/125 (10.1%) in < 40 years and 15/125 (12%) in > 40 years of age. To date, this incidence of 10–12% is the highest in the literature. In our study frequency of coronary artery dilatation was 12.5%. This may be due to same genetic make-up, geographical distribution and higher prevalence of coronary artery disease in Indian sub-continent. A study conducted in Northern Greece by Giannoglou GD et al<sup>22</sup> where CAE was (14.3%), representing 1.6% of the total number of women. Thus men exhibited a 1.99 times higher likelihood of Coronary artery ectasia compared with women. Male to female ratio was 2.7:1 in our study. In a study by Gunes Y et al<sup>23</sup> CAE was detected in 1.38% patients. Fifty-nine percent patients had coexisting significant CAD while in our study it was seen in 90.2% of patients. Slightly higher values are due to selection of patients highly suspicious for CAD undergoing coronary angiography. In a study by Yilmaz H et al<sup>24</sup> a prevalence of CAE was 4.2%. The results were compared with those patients who had CAD but not CAE. CAE was isolated in 26.6% and was associated with significant coronary artery stenoses in 73.4%. In a study conducted in South Africa by Grigorov V et al<sup>25</sup>

cases of CAE were identified via the database. Patients included were with Markis type I, II and III disease, as diagnosed from their angiographic recordings. The frequency of arterial involvement was as follows: RCA in 95% of the patients, LAD in 65%, LCx in 50%. The least affected artery appears to be the LMCA, possibly because in coronary artery disease, the LMCA is usually least affected. In a study by Grönke S et al<sup>26</sup> diagnostic coronary angiographies were retrospectively evaluated for the presence of dilated coronary segments. RCA was most frequently involved (RCA: 97%, LAD: 30%, RCX: 23%, LCA: 35%). In patients with one-vessel disease the RCA was exclusively affected. In our study RCA 72.5%, LAD+LCX 13.5%, LCX 9%, and LAD+LCX was involved in 5% of patients.

## CONCLUSION

Coronary artery dilatation -ectasia and Aneurysm- were more common in male, RCA was involved in majority of patients and is not a benign condition. These patients should not be considered not to have coronary syndrome because they do not have coronary narrowing; but these dilated vessels are predisposed to spasm, thrombus-formation, spontaneous dissection, myocardial infarction, sudden death and angina pectoris. This is small study needs large studies to identify frequency of coronary artery dilatation.

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