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FREQUENCY OF CORONARY ARTERY ANOMALIES IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY.

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ABSTRACT: Coronary artery anomalies are abnormalities in coronary arteries by birth (congenital) and involve their anatomy, course and function. They usually occur in association with other congenital cardiac defects. Coronary artery anomalies are usually clinically silent as they do not cause symptoms and are found incidentally but relatively few become evident by causing symptoms. **Objectives:** Determine the frequency of coronary artery anomalies in patients undergoing coronary angiography. **Study Design:** Cross sectional study. **Setting:** Faisalabad Institute of Cardiology, Faisalabad. **Period:** July to December 2017. **Material & Methods:** Demographic information from all the patients was recorded and all of these individuals were undergone coronary angiography. All the collected data was analyzed by SPSS. **Results:** The mean age of the patients was 43.74 ± 15.35 years, male and female patients were equal in number. In this study coronary anomalies were present in 28(4.06%) patients. **Conclusion:** Coronary artery anomalies are found quite frequently but usually are incidental finding.

Key words: Anomalies, Congenital, Coronary Artery, Heart, Patients.

INTRODUCTION

Coronary artery anomalies are abnormalities in one or more of the cardiac coronary arteries by birth (congenital). They affect their anatomy (origin, course and termination) and function. The incidence of these anomalies is less than 1.5% worldwide. These anomalies can be divided into benign or malignant, based on the symptoms they cause. Coronary anomalies are usually benign and common types are separate origins of left anterior descending (LAD) artery and left circumflex (LCX) artery from aortic left sinus of valsalva, LCX artery originating from aortic right sinus of Valsalva or right coronary artery (RCA) and RCA arising aberrantly from aorta.[1]

Coronary anomalies almost never cause symptoms and are most of the times diagnosed as an incidental finding during cardiac catheterization for other indications or at autopsy. Sometimes these anomalies cause symptoms due to arrhythmias, myocardial ischemia/ infarction, syncope and sudden cardiac death (SCD).[2] These anomalies are the second most common cause of SCD in athletes, occurring between 12.2% and 17.2% in Western countries.[3-5] In a study which was conducted in Peshawar, Pakistan, the coronary anomalies were seen in 2.2% of study population. In this study the commonest anomalies were myocardial bridging, separate origins of LAD and LCX from aorta and LCX artery arising from right side of aorta.[6]

The incidence of coronary anomalies in different groups of patients by various diagnostic tools and methods had been evaluated in several large studies. A higher incidence of coronary anomalies in young victims of SCD as compared to adults (4.15% vs 1%, respectively) had been reported in one study.[7] Angelini et al. described an incidence of coronary anomalies in 5.6% of individuals using angiography. Split RCA (1.23%)

and RCA arising aberrantly near the right sinus of Valsalva (1.13%) were the frequent anomalies.[8]

In a large retrospective study, the incidence of coronary anomalies was 1% in adults and 0.9% in children. The most frequent anomaly was aberrant origin of LCX in adults (25% cases). In symptomatic adults, the main causes were anomalous LCA from pulmonary artery and myocardial bridging. Anomalous LCA from the pulmonary artery was most common anomaly in children (48% cases) and most of the children were symptomatic. At autopsy, the incidence of coronary anomaly was 0.2%. Coronary artery abnormalities were only second to hypertrophic cardiomyopathy as a cause of sudden cardiac death in young athletes. There was no race or sex predisposition.[9] Coronary artery anomalies cause myocardial ischemia and manifest clinically as the following; myocardial dysfunction/heart failure, angina, syncope, arrhythmias and sudden cardiac death.[10] In children, coronary artery anomalies usually presents in infancy and early childhood as cardiogenic shock, poor feeding or failure to thrive. They cause symptoms during activity in late childhood and adolescence. [11]

OBJECTIVE
To determine the frequency of coronary artery anomalies in patients undergoing coronary angiography.

MATERIAL AND METHODS
This study was Cross Sectional Study carried out in Faisalabad Institute of Cardiology, Faisalabad from July to December 2017. The sample size was calculated by using WHO formula;
Confidence Level: 95%
Anticipated population proportion p: 2.2 %
Absolute precision required: 1.1 %
Sample size: 690.
Consecutive sampling technique was used.

All patients of either gender between 18-70 years of age undergoing coronary angiography were included. Following cases were excluded from study; pregnancy, known serious allergic reaction to the contrast medium, renal and respiratory failure, patients who already had undergone cardiac catheterization procedure.

Data Collection & Analysis Procedure
All eligible patients were enrolled in this study. Informed written consent was taken from all the patients and procedure was explained to them that this is a research based study. Their examination & procedure were performed free of cost. Approval was taken from hospital ethical committee. All of these patients were subjected to coronary angiography. Demographic features and presence/absence & types of coronary artery anomalies were recorded on proforma. All the data was entered and analyzed using statistical package for social sciences (SPSS). Mean and standard deviation was calculated for age of the patients. Frequencies with percentages were recorded for qualitative variables like gender, coronary anomalies/ types of coronary anomalies. Chi square test was used for post stratification significance. A p-value of <0.05 was considered as significant.

RESULTS
In this study 690 patients were enrolled. The mean age of the patients was 43.74 ± 15.35 years (range 18 - 70 years). Male patients were 345(50%) and female patients were also 345(50%). Coronary anomalies were present in 28(4.1%) patients. Out of 28 patients, 13(46.43%) were male and 15(53.57%) were female patients. This difference was statistically insignificant (p= 0.70). {Table-I}

Among study population, myocardial bridging was found in 11(1.6%) patients, anomalies of origin of LCA, LAD & LCX in 7(1%) patients, anomalies of origin of RCA in 7(1%) patients and coronary artery fistulae were found in 3(0.4%) patients. {Table-II}

Mean age (years)		43.74 ± 15.35
Male		345 (50%)
Female		345 (50%)
Coronary anomalies		28 (4.1%)
Coronary anomalies gender vise (n=28)	Male patients	13 (46.43%) p = 0.700
	Female patients	15 (53.57%) p = 0.700
Table-I. Demographic features & coronary anomalies (N=690)		

Myocardial bridging	11 (1.6%)
Anomalies of origin of LCA, LAD & LCX	7 (1.0%)
Anomalies of origin of RCA	7 (1.0%)
Coronary artery fistulae	3 (0.4%)
Total	28 (4.1%)

Table-II. Frequency of types of coronary anomalies

DISCUSSION

Coronary artery anomalies have a wide range in terms of prevalence and age distribution depending upon study population and diagnostic method. In this study, mean age of the patients was 43.47 years (range 18 – 70 years) and 50% were male. The frequency of coronary artery anomalies was 4.1% (28 cases out of 690 patients). Out of 28 patients, 13 (46.43%) were male and 15 (53.57%) were female patients. Myocardial bridging was found in 11(1.6%) patients, Anomalies of origin LMCA, LAD & LCX were found in 7(1.0%), similar number of patients had anomalies of origin of RCA while 3(0.4%) patients had coronary artery fistulae.

Ibrahim et al described that in Peshawar prevalence of coronary anomalies were 2.2% and 61.12% patients were male. Myocardial bridging, separate origins of LAD & LCX and LCX artery arising from right sinus of Valsalva were main anomalies. Most of the anomalies were benign (95.7%) while 4.3% anomalies resulted in serious symptoms.[6] The is no autopsy study in Pakistan describing coronary artery anomalies as cause of sudden cardiac death.

In a study by Yildiz et al revealed that incidence of coronary artery was 0.9% and mean age was 52±8 years (range, 22–79 years) in 112 patients. Anomalous origin and course were more frequent (89.3%) and coronary artery fistulae were present in 10.7% cases.[12] Namgung et al studied 8864 patients and described coronary anomalies in 103 (1.16%) patients. Abnormal coronary origin and course were present in 90 patients (87.4%) while in 13 (12.6%) patients coronary artery fistulae were found. Among coronaries RCA was anomalous in 41 patients (39.8%).[13] Aybala Tongut and colleagues found anomalous coronary arteries in 9.37% study population with

mean age of 55.9 ± 12 years.[14]

Schmitt R et al[15] using computed tomographic coronary angiography (CTCA) studied 1758 patients and found anomalies coronaries in 44 (2.5 %) patients. Recently, Srinivasan et al.[16] evaluated 1495 patients using CTCA described 0.8% prevalence of coronary anomalies.

As shown in different studies, coronary artery anomalies are found in middle aged adults during invasive and non invasive coronary diagnostic procedures or at autopsy. They have no sex predilection. They have wide variation in their prevalence but their types are quite similar. These anomalies are usually benign but in some patients they become symptomatic even life threatening.

CONCLUSION

Coronary artery anomalies are quite frequent and are found as incidental findings during coronary angiography or at autopsy. They are usually benign but could lead to life threatening symptoms or sudden death.
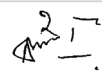**Copyright© 25 Dec, 2019.**

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