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ANGIOGRAPHIC CHARACTERISTICS AND INCIDECNE RATE OF CORONARY ARTERY ECTASIA

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Abstract:

Objective: *To determine the incidence rate of CAE (Coronary Artery Ectasia) in the patients and their angiographic traits.*

Methodology: *A retrograde research work carried out on all the angiograms of coronary artery conducted in Allied Hospital Faisalabad. The duration of this study was from November 2016 to December 2019. We performed a follow up of two year to examine the primary as well as secondary endpoints. The collection of the data carried out from the catheterization films and clinical records of the patients.*

Results: *Total 5000 coronary angiograms were conducted in the duration of this research work. A sum of total 2.8% (n: 140) angiograms displayed the coronary ectasia of both pure as well as mixed types. Pure ectasia without coronary obstructive abrasions was present in 1.5% (n: 75) patients. The most frequent affected vessel was LAD (Left Anterior Descending) artery (63.0%) followed by RCA (Right Coronary Artery) 25.0% and 10.0% patients were present with the involvement of the circumflex artery. Primary endpoint stated 4.20% (n: 6) patients with non-ST myocardial infarction elevation, 3.60% (n: 5) patients with ST elevation inferior wall Myocardial Infarction, 50.0% (n: 70) were present with unstable angina and there were 1.40% (n: 2) deaths because of the pulmonary edema. The secondary endpoints stated that 50% patients were still complaining the pain in chest.*

Conclusion: *The rate of incidence of Coronary Artery Ectasia in the patients of this research work was 1.50%. Most of the patients were from male gender, having association with dyslipidemia, HTN (Hypertension) and habit of cigarette smoking. There was association of the coronary artery ectasia with the disease of obstructive coronary artery in 80% patients. The most common affected vessel was Left Anterior Descending artery.*

KEYWORDS: *Vessel, Left Anterior Descending, Right Coronary Artery, Hypertension, Coronary Artery Ectasia, Coronary, Obstructive, Ectasia.*

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INTRODUCTION:

Coronary Artery Ectasia is elaborated as diffuse or localized dilation of greater than 1.50 times normal adjacent vessel's segments [1]. As it was initially elaborated by Morgagni about its reason, clinical sequelae & therapy, there is estimation that 50.0% Coronary Artery Ectasia has relation with the atherosclerosis, while 20.0% to 30.0% patients may be because of congenital complications [2]. This complication of Coronary Artery Ectasia is most commonly encountered in male patients and in majority of these patients, it seems to have association with the coronary atherosclerosis [3]. Ectasia & aneurysms have association with a vast group of abnormalities and the characterization and assessment of the coronary ectasia & aneurysms symbolize a great task of diagnosis with the therapeutic and clinical implications. There is variation in the underlying etiology and it includes infectious, degenerative, congenital, traumatic, toxic and inflammatory reasons. Ectasia is more commonly present in relation with the atherosclerosis or as the compensatory mechanism in the patients in which there is presence of proximal stenosis in opposite coronary artery unlike aneurysms; ectasia is also present in some anomalies of the coronary artery like abnormal origin from pulmonary artery, or as an outcome of high flow state, as seen in the fistulas of the coronary artery [4].

Pure ectasia can be implicated in Myocardial Infarction OR angina, adverse prognosis depends on the relation of the stenotic disease of coronary artery [5, 6, 7]. Coronary Artery Ectasia may lead to the ischemia induced by exercise particularly in a diffuse form [8]. There is presence of Coronary Artery Ectasia in the patients present with the slow flow of blood. So, Coronary Artery Ectasia has association with the slow flow of blood in the coronary artery and it has often association with the availability of the hypertrophic cardiomyopathy [9]. The quantification of the blood flow of coronary artery carried out with the utilization of the TIMI (Thrombosis in Myocardial Infarction) frame-count procedure [10]. In this current research work, the analysis of the data present on the lesions of ectasia carried out.

METHODOLOGY:

A retrograde analysis on all the coronary angiograms carried out at Allied Hospital Faisalabad in the period of this research work. In this research work, we included a sum of 5000 coronary angiograms. The classification of the ectasia carried out in accordance with the Markis classification as present in Table-1 [7]. This included the finding of the main involved coronary vessels and classifying ectasia in every vessel involved as diffuse or focal.

Table-1: Angiographic Types According to Markis Classification

Type	Ectasia type and location	Percentage of cases in our study
Type I	Diffuse ectasia of two or three vessel	50
Type II	Diffuse disease in one vessel and disease in another vessel	17
Type III	Diffuse disease in one vessel only	5
Type IV	Localized or segmental ectasia	28

The modification of the classification carried out to be simpler and to be capable for the prediction of prognosis and hence the choice of the treatment as mentioned in Table-2. New classification described three groups according to the amount of the major involved coronary vessels. After that, subdivision carried out into mixed, diffused and focal. The collection of data carried out from the catheterization films, and clinical records. There are two endpoints of this research work; primary & secondary. Primary endpoint was MACE (Major Adverse Cardiac Event) rate, composite end point of UA (Unstable Angina) with electrocardiographic alterations, myocardial infarction and cardiac death. The secondary endpoints were recurring pain in chest, the requirement of the repetition for cardiac catheterization, visits to the emergency room for pain in chest and admission in the hospital for pain in chest.

Table-2: Percentage of Individual Coronary Vessels Affected by Ectasia Modified Markis Classification

Vessel	Focal (%)	Diffuse (%)	Total involvement (%)
LAD	7	8	15%
RCA	48	40	88%
LCX	16	19	35%
L.M	5	3	8%

RESULTS:

In the duration of this research work, we performed total 5000 coronary angiograms. 2.80% (n: 140) angiograms stated the presence of coronary ectasia of both kinds mixed & pure. 80 angiograms displayed the presence of pure ectasia with no obstructive coronary abrasions. The most common affected artery because of ectasia was RCA (Right Coronary Artery) (88.0%), followed by LCX (Left Circumflex) coronary artery in 35.0% and then Left Anterior Descending in 15.0% patients as mentioned

in Table-2. We also presented the characteristics of demography of the patients. The average age of the patients was 52.10 ± 10.30 years with a range from 30 to 85 years. Among these patients, 64.0% (n: 89) were present with less than 65 years of age. 57% (n: 80) were present with BMI of more than 26.0 kg/m2, 50 (37.0%) patients were addict of smoking, 77 (55.0%) were suffering from hypertension, 36 (26.0%) were suffering from DM (Diabetes Mellitus), and 58 patients were present with dyslipidemias with increased serum LDL (Low Density Lipoprotein) and TG (Triglycerides) & reduced HDL (High Density Lipoprotein) levels. Most important indication for catheterization of heart was the anginal type pain of chest in 90.0% patients. The modalities of the treatment included the anti-coagulation with the help of warfarin alone in 14.0% (n: 20) patients, anti-platelet treatment with the use of aspirin alone in 56.0% (n: 78) patients, and a combination of both medicines in 70.0% (n: 98) patients. Nitrate treatment was utilized in 34.0% (n: 48) patients, calcium channel blockers in 25.0% (35) patients and beta blockers in 20.0% (28) patients.

The range of the follow up period was three months to two years. Primary endpoint stated 4.20% (n: 6) patients with NSTEMI (Non-ST elevation Myocardial Infarction), 3.60% (n: 5) patients with elevation ST inferior wall Myocardial Infarction, 50.0% (n: 70) patients with UA and 1.40% (n: 2) patients died because of pulmonary edema. The secondary endpoint showed 46.0% (n: 65) patients were still available with pain in chest. 24% (n: 34) presented to room of emergency in the duration of this period. 19 patients got discharge from emergency room after being diagnosed. There was need of repeated catheterization in 6 patients.

DISCUSSION:

Enzymatic dilapidation of extra-cellular matrix of media is the main pathophysiologic procedure that causes the development of ectasia [11]. The average prevalence of Coronary Artery Ectasia is from 1.0% to 5.0%. In accordance with the definition of angiography, used in a study of surgery of coronary artery, vessel is considered to be when diameter of vessel is greater than 1.50 times that of adjacent normal segment in segmental ectasia [12]. Most of the Coronary Artery Ectasia have strong association with the systemic and local atherosclerosis incidence of ectasia and aneurysmal disorder in FH (Familial Hypercholesterolemia) [13]. There is association of Coronary Artery Ectasia with many other pathologies. Exposure to herbicides containing nitric oxide as well as acetyl cholinesterase for long durations results in the relaxation of the muscle cells [14]. There was inverse association of DM with the Coronary Artery Ectasia [15]. In different research works, coronary artery ectasia has been elaborated as isolated congenital abrasion [16].

Hyperhomocysteinaemia is known as an autonomous risk factor for diseases of arteries, cerebro-vascular diseases and peripheral-vascular complications [17]. The prevalence rate of Coronary Artery Ectasia in the patients who are undergoing catheterization has a range from 0.30% to 4.90% in various series, irrespective of related stenosis of coronary artery [18]. It is an established fact that smoking and CVDs (Cardio-vascular Diseases) have influence on inflammation. There is variation in the coronary vessel's involvement, different research works stated that the most common involved vessel was Right Coronary Artery but some research works declared the Left Anterior Descending as the main vessel.

This current research work found a variation in the Coronary Artery Ectasia clinical spectrum. Most frequent symptom in this complication is exertional angina [19]. Propensity to thrombosis because of reduced coronary flow and vasospasm due to structural alterations in the wall of vessels may be the reason of pain in chest and even Myocardial Infarction. Majority of the patients of this research work got treatment with the use of warfarin & aspirin. Some professionals prescribed the anti-coagulation treatment for long duration.

CONCLUSION:

This research work was retrospective examination of the angiograms stating ectasia, with follow up of one year to determine the incidence rate of particular cardiac events. Coronary Artery Ectasia is not only the dilatation of the wall of vessel because it may cause various cardio-vascular abnormalities. It is among the less common reasons of the Myocardial Infarction and there is requirement of the aggressive clinical treatment for the administration of this angiographic entity.

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