AUDIT OF CORONARY ARTERY DISEASE IN PATIENTS WHO UNDERWENT CORONARY ANGIOGRAPHY AT A TERTIARY CARE HOSPITAL AND FREQUENCY OF RIGHT SYSTEM DOMINANCE

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Author's Contribution

AJ:Conducted the study and wrote the article. GM: Helped in review the article. LA: Re-arranged data and corrected article. HK: Tables and figures. MKR and SI made corrections and did the proof reading.

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ABSTRACT

BACKGROUND: Ischemic heart disease or Coronary artery disease (CAD) is a problematic epidemic in our country leading to premature disability in the form of heart failure, loss of job, loss of interest in life and dependency either by myocardial infarction or unstable angina which causes ischemic cardiomyopathy. This study was conducted to determine coronary angiographic findings among patients undergoing coronary angiography in our catheterization laboratory (Cath Lab) and to determine the right system dominance.

MATERIAL AND METHODS: Cross sectional, retrospective study carried out at Cardiology department of Shaikh Zayed Medical College/Hospital Rahimyar khan from February 2011 to December 2017. A total of 1719 patients who has undergone coronary angiography were included for study analysis. All the patients undergoing coronary angiography regardless of age and gender. Congestive heart failure patients, patients of chronic liver disease, patients having impaired renal functions, fever, septicemia, prior stroke or disability or not giving consent for coronary angiography. Variable selected were coronary angiographic findings (like coronary dominance, disease of left main coronary artery (LMD), left anterior descending coronary artery (LAD), left circumflex artery (LCx) and right coronary artery (RCA) and risk factors like smoking, hypertension (HTN),diabetes mellitus (DM), dyslipidemia and family history (FH).

RESULTS: The patients were having a mean age of 51 ± 10 years. 1274 (74%) were male, 1027 (57.2%) were from rural areas. 1282 (70.5%) were having right coronary system dominant, 383 (22%) were diabetics, 643 (37%) were hypertensive, only 46 (2.7%) were having family history of Coronary heart disease. Out of 1719 patients who has undergone angiography, 932 were advised Echocardiography, among these 563 (60.4%) patients were having normal left ventricular ejection fraction (LVEF). 1537 patients record for angiographic findings was sufficient and included for analysis. 626 (40.7%) were having triple vessel disease, 307 (19.9%) were having double vessel diseases and 302 (19.6%) were having single vessel disease.

CONCLUSION: This study concludes that in our patients who underwent angiography, most common vessel dominance system was right dominant. Hypertension, diabetes mellitus, and family history of CAD were common risk factors. Majority of the patients who has under gone angiography, were having normal LVEF. Most common coronary disease pattern was involvement of all three vessels followed by double vessel diseases and single

vessel disease.

INTRODUCTION:

Ischemic heart disease (IHD) is an epidemic in our country leading to premature disability in the form of hea rt failure, loss of job, loss of interest in life and dependency either by myocardial infarction or unstable angina which causes ischemic cardiomyopathy.[1] Almost every house in Pakistan directly or indirectly has an ischemic heart disease patient.[2,3] The reason behind it apart from conventional factors like hypertension, Diabetes mellitus smoking, family history, dyslipidemia, psychotic problems like anxiety and depression are emerging new risk factors.[4,5] This silent disease manifest itself in few of the total patients having its typical symptoms of chest pain and dyspnea and few among these seek medical help. Our city Rahimyar Khan situated in the crux of Pakistan draining about 200 km and patients from all the three major provinces including south Punjab, North eastern Sindh and few areas of Baluchistan. This geographic situation truly represents major ethnic groups of Pakistan. Catheterization laboratory (Cath Lab) was built in year 2010 and became functional in February 2011. Majority of patients of IHD presenting in emergency department (ER) of our institution, Shaikh Zayed Medical College/Hospital (SZMC/H) after stabilization in ER and shifted to cardiology department from where they are advised coronary angiography according to symptoms, laboratory tests results (Labs), ECG findings and traditional/classic risk factors.[6,7] We found that majority of these patients having severe coronary artery disease requiring revascularization to fix their lesions. An audit of such patients is presented here to show its magnitude and a need and early measures to stop its occurrence by creating awareness among people through various means.

MATERIAL AND METHODS:

This was a cross sectional, retrospective study carried out at Cardiology department of Shaikh Zayed Medical College/Hospital Rahimyar Khan from February 2011 to December 2017. A total of 1719 patients who underwent coronary angiography were included for study analysis. All the patients undergoing coronary angiography regardless of age and gender were included. Congestive heart failure patients, patients of chronic liver disease, patients having impaired renal functions, fever, septicemia, prior stroke or disability or not giving consent for coronary angiography were excluded. Variable selected were coronary angiographic findings were coronary dominance, disease of left main coronary artery (LMD), left anterior descending coronary artery (LAD), left circumflex artery (LCx) and right coronary artery (RCA) and risk factors like smoking, diabetes mellitus (DM), hypertension (HTN), family history (FH) and dyslipidemia. Version 20 of SPSS was used for data analysis. Data retrieved from the patients record files and central review station of Cath Lab and stored in Microsoft Excel file. Ethical approval was sought from Institutional Review Board (IRB).

RESULTS:

This cross sectional, retrospective study was carried out to assess the risk factors, LVEF and angio-

Table I: Descriptive statistics of coronary artery disease.

| Variable		Frequency	Percentage
Gender	Male	1274	74.2%
	Female	445	25.9%
Vessel Dominance	Left dominant	294	16.1%
	Right dominant	1282	70.5%
	Co-dominance	143	7.8%
City type	Rural	1027	57.2%
	Urban	692	38.3%
Diabetes	Diabetic	383	22.3%
	Non-diabetic	1336	77.7%
Hypertension	Hypertensive	643	37.4%
	Non-Hypertensive	1076	62.6%
Family History	Family History Positive	46	2.7%
	Family History Negative	1673	97.3%
Smoking	Smoker	405	23.6%
	Non-smoker	1314	76.4%
Obesity	Obese	376	21.9%
	Non-obese	1343	78.1%
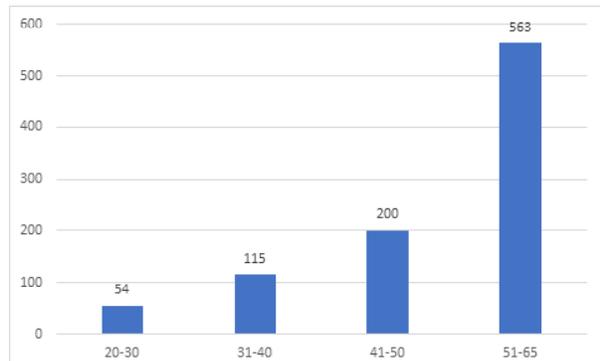
Figure I: Ejection fraction of left ventricular in different age groups.
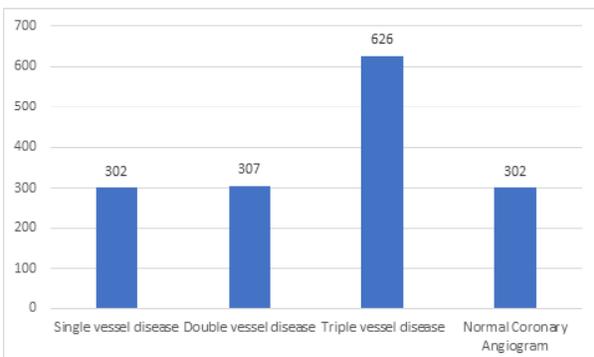
Figure II: Distribution of coronary artery disease affected in CAD patient as diagnosed on angiography

graphic findings of CAD patients. The patients were having mean age of 51±10 years. Males were 1274 (74%) and 1027 (57.2%) were from rural areas. Regarding vessel dominance 1282 (70.5%) were having right dominant system, 383 (22%) were diabetics, 643 (37%) were hypertensive, only 46 (2.7%) were having family history of coronary heart disease (Table I). Figure I shows that out of 1719 patients who has under gone angiography, 932 were advised Echocardiography, among these 563 (60.4%) patients were having normal LVEF. Figure II shows that out of 1719 patients the record for angiographic findings was sufficient in only 1537 patients and hence included for analysis. 626 (40.7%) were having triple vessel disease, 307 (19.9%) were having double vessel diseases and 302 (19.6%) were having single vessel disease.

DISCUSSION:

This retrospective, cross sectional study was performed to assess risk factors, LVEF and angiographic finding of CAD patients. The patients were having mean age of 51±10 years, and 1274 (74%) were male, 1027 (57.2%) were from rural areas. In a previous study, in contrast, median age was 71 years and male were 56% of the study sample.[8] They also found that patients presenting in emergency department with acute coronary syndromes (ACS) were mostly young with 52.8% had (STEMI) ST segment elevation myocardial infarction. Regarding vessel dominance 1282 (70.5%) were right dominant system, 383 (22%) were diabetics, 643 (37%) were hypertensive, only 46 (2.7%) were having family history of ischemic heart disease. Out of 1719 individuals included in the study who has under gone angiography, 932 were advised Echocardiography, among these 563 (60.4%) patients were having normal LVEF. In a previous study they found that right dominance

was present in majority 91% of patients while left dominance was seen in 9% , this is in contrast to our study, where only 70.5% were right dominant. However, the authors in that study also noted that at the completion of study follow up, the outcomes in patients who had noticeable CAD (defined as more than 50% luminal stenosis) with right dominance and left dominant system was same. [(HR) hazard ratio of 0.46 with p = 0.15]. Similarly, in patients with no appreciable CAD , no significant difference was observed. 10 In yet another study, which assessed the coronary dominance, found that 81.2% were right dominance, 9.1% were left dominance, and 9.7% were co-dominant. They also found that overall, a decrease in magnitude of left and co-dominant coronary systems was observed with increase in age.[11] In another study, large sample size was evaluated and it was reported that non-fatal myocardial infarction and all-cause mortality were associated with left dominant system and it may be strong predictor for mortality. Patients who have left dominant system usually are associated with a poor outcome as compared with patients who have dominant right system.[12] Regarding outcome and dominance system in coronary artery system, a study included patients with normal coronary arteries and patients with noticeable CAD . All patients underwent CCTA and were followed for 60 months. There was no significant difference noticed in both the groups regarding mortality in relation to dominance of right or left system . But in patients with left main stem CAD , left dominant system was associated with a worse outcome with high hazard ratio.[13] This analysis showed that out of 1537 patients record for angiographic findings was sufficient and included for analysis, 626 (40.7%) were having triple vessel disease, 307 (19.9%) were having double vessel diseases and 302 (19.6%) were having single vessel disease.

In a previous study which included both elderly and young patients, it was observed that young patients usually have normal coronary arteries while elderly have double or triple vessel CAD. The presence of LMD was noticed in 3.4%, while noticeable CAD was 45.4%, and multivessel disease was 28%. The association of LMD and multi-vessel disease was 31.4%. The findings were similar between the two groups; most commonly LAD was having significant disease. Chronic total occlusion (CTO) was mostly seen in right coronary artery.[13]

The available data has shown the prevalence of normal coronary in 37% general patients while in ACS it was reported to be 16.9%. Significant

coronary artery disease was present in 75.4% and critical disease was present in 95.9%. 61.9% patients showed single vessel disease out of which LAD was most commonly involve. Most common risk factors was dyslipidemia and in hospital mortality was reported to 0.7%.[9]

Limitation of this study includes that outcome of the presentation and lesion was not studied in this analysis of data.

CONCLUSION:

This study concludes that in our patients who underwent angiography, most common vessel system was right dominant and hypertension, diabetics, and family history of coronary artery disease were common risk factors. Majority of the patients who has under gone angiography, were having normal LVEF.Most common coronary disease pattern was triple vessel disease, followed by double vessel diseases and single vessel disease.

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