Original Article

FREQUENCY OF CORONARY ARTERY DISEASE IN PATIENTS OF RHEUMATIC HEART DISEASE UNDERGOING VALVULAR SURGERY

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SN:Conducted the study and wrote the article. MS:Helped in review the article. KZ:Re-arranged data and corrected article. RR:Tables and figures. FQ and MF made corrections and did the proof reading.

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ABSTRACT

INTRODUCTION:Coronary Artery Disease (CAD) is not uncommon association with valvular heart disease but limited data on concomitant valvular heart disease with coronary artery disease is available. Variation in prevalence of CAD Disease in relation to Rheumatic Heart Disease (RHD) is also anticipated in this regard. The occurrence of CAD in patients with RHD alters the treatment and clinical outcome.

OBJECTIVE: The objective of the study was to assess the frequency of CAD in patients of RHD undergoing valvular surgery.

MATERIAL AND METHODS:This cross-sectional study was conducted at Cardiology department of Punjab Institute of Cardiology, Lahore, Pakistan from September 8, 2018 to March 7, 2019. Non probability purposive sampling technique was used in this study. Total sample size of the study was 50 patients. Patients with rheumatic valvular disease between 15-60 years were included. Patients with contraindications to CT coronary angiography , shock etc were excluded.

RESULTS:Most of the patients were between 36-45 years of age i.e. 54%(n=27), mean +sd was calculated as 43.48+6.75 years. 78%(n=39) male and 22%(n=11) females. Frequency of CAD in patients of RHD undergoing valvular surgery was 18%(n=9).

CONCLUSION: Noticeable number of patient with RVD has CAD. So it may suggests that every patient who present with Rheumatic Heart disease and undergoing valvular surgery, should be risk stratified for the presence of coronary artery disease.

KEYWRODS: Rheumatic Heart Disease (RHD), Valvular Surgery, Coronary Artery Disease (CAD), frequency

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INTRODUCTION

Especially in developing countries RHD is one of the most commonly occurring heart disease and contributes to a significant proportion of community health burden. Almost one quarter of heart failure cases are accounted by RHD in the third world nations where Rheumatic Fever is endemic.[1,2] In one local study, the prevalence of rheumatic heart disease diagnosed on echocardiography was approximately 5.7/1000.[3] In the current situation 12.2% of patients with RHD have concomitant CAD. (as detected on conventional Coronary Angiography).[4]

Although conventional catheter based Coronary Angiography is highly sensitive for diagnosing CAD, MDCT Coronary Angiogram has recently been shown to be useful tool for this purpose, because of its noninvasive nature, low cost, low risk of complications and high sensitivity and negative predictive value. In the registry estimate, 64-slice MDCT angiogram had sensitivity of 99% in detecting significant coronary artery stenosis(>/= 50% of stenosis), with negative predictive value of 100%.[5] It is reasonable to use this new modality as initial test in a group of patients with low probability of CAD. It has been efficiently used in patients undergoing valvular surgery.[6]

Concomitant significant stenosis of Coronary Artery in RHD alters the treatment strategy, making the surgical procedure more complex and is a main predictor of perioperative mortality. The occurrence of CAD vary over the different parts of the world, countries and even between the different parts of a same country.[7] So on these basis variation in prevalence of CAD in relation to RHD is also anticipated. Very little data is available in this regard and no such study has been conducted in Pakistan. That's why this study is aimed to find out frequency of CAD in RHD patients who are undergoing valvular surgery in our country.

MATERIAL AND METHODS:

This cross sectional study was done in Department of Cardiology /Punjab Institute of Cardiology Punjab, Pakistan over a period of 6 months from September 8, 2018 to March 7, 2019. Total 50 cases were enrolled in the study. Purposive non probability sampling technique was used. Patients of both genders with age 15 to 60 and having rheumatic heart disease patients undergoing valvular surgery were included. Patients with unsuitability for multi detector computed Tomography (patients whose serum creatinine is more than 1.4 mg/dl, with chronic kidney disease who are on dialysis, having severe anemia (Hb< 7g/dl), having rhythm other than normal sinus rhythm, allergy to contrast, inability to hold breath for 15 seconds) were not included. Patients with cardiogenic shock defined by blood pressure less than 90/60, patients who have known coronary artery disease defined by history and patient record and non rheumatic valve disease like degenerative valves, myxomatous valves, congenital valvular disease were also excluded.

Rheumatic Heart Disease was labeled as having echocardiographic evidence of stenosis or regurgitation of any cardiac valve needing surgical intervention. Valvular surgery was defined as replacement /repair or open valvotomy of any cardiac valve. Coronary Artery Disease was considered if there is ≥50% luminal narrowing in an epicardial coronary artery on Multidetector Computed Tomography. All subjects underwent CT coronary angiography to assess coronary arteries.

STATISTICAL ANALYSIS:

The data was analyzed using SPSS (Statistical Package for social sciences release 20.0; SPSS, Inc; Chicago, IL) system for Windows. Mean ± SD (Standard deviation). Data was stratified for age groups (15 to 25years, 26 to 35years and 36 to 45, 46 to 60 years), and presence /absence of coronary artery disease.

RESULTS:

The age of the patients ranges from 15 years to 60 years with mean +sd was calculated as 43.48+6.75 years. Male to Female ratio was 3.5:1. Frequency of CAD in patients of RHD undergoing valvular surgery reveals in 18%(n=9)

Table 3: Frequency of coronary artery disease in patients of rheumatic heart disease undergoing valvular surgery(n=50)

Coronary artery disease	No. of patients	%
Yes	9	18
No	41	82
Total	**50**	**100**

Table 4: Stratification for frequency of coronary artery disease in patients of rheumatic heart disease undergoing valvular surgery with regards to age(n=9)

Age(in years)	No. of patients	%
15-25	--	--
26-35	--	--
36-45	6	66.67
46-60	3	33.33
Total	**9**	**100**

while 82%(n=41) had no findings of the morbidity. (Table No. 3). Stratification for frequency of CAD in patients of RHD undergoing valvular surgery revealed that out of 9 cases of CAD, 66.67%(n=6) were between 36-45 years while 33.33%(n=3) were between 46-60 years of age, while no patients were between 15-35 years. (Table No. 4).

DISCUSSION:

Significant number of patients with valvular heart disease also have CAD but the clear data of such association is not widely available. Variation in prevalence of CAD in relation to RHD is also anticipated while limited data is available in this regard.

However, we planned this study to find out frequency of CAD in RHD patients who are undergoing valvular surgery in our country.

In our study, most of the patients were presented between 36-45 years of age i.e. 54%(n=27), mean + sd was calculated as 43.48+6.75 years, 78%(n=39) male and 22%(n=11) females, frequency of coronary artery disease in patients of rheumatic heart disease undergoing valvular surgery reveals in 18%(n=9) while 82%(n=41) had no findings of the morbidity.

Reddy KS and colleagues8found that 12.2% of patients with valvular heart disease have associated coronary artery disease as detected by conventional coronary angiogram. These findings are in agreement but slightly higher as compared to this study.

Another study by Ayaz Hussain Shaikh and co-workers9 determined that in 31.3% of patients undergoing valve surgery at a tertiary level cardiac center have concomitant coronary artery disease.

Another study10 conducted in China to determine the burden of atherosclerotic disease and its risk factors among the patients undergoing valve surgery for Rheumatic Heart Disease. The study concluded that coronary angiography should be done in all patients clinically suspected with CAD, aged > 50 and in those havinganginal chest pain and/or coronary risk factors in order to decrease the occurrence of operative complications.

Sonmez K and colleagues determined CAD occurrence in Turkish patients undergoing valvular heart surgery and recorded significant CAD present in 15.8% of patients,11 the findings of the current study are in agreement with the above study.

Enriquez-Sarano M determined that in patients undergoing catheterization before mitral valve replacement CAD was found in 33%.12 Our data is in contrast with this finding. The reason behind this difference is unknown, however this difference is not statistically significant.

In a study by Jose VJ et. al. it was also found that the prevalence of severe CAD in RHD patients was actually low and it was regarded that valvular heart disease offers some degree of protection against the coronary atherosclerosis. This result is actually in contradiction with our findings.13

In the context of high prevalence of RHD in our part of the world it is essential to identify the and detect the significant CAD in this subset of population.

The limitation of the study was that we did not record this prevalence according to type of valvular disease. However, the main objective of the study was achieved without stratifying the type of valvular disease.

CONCLUSION:

The frequency of coronary artery disease is considerably high among patients with Rheumatic Heart Disease undergoing valvular surgery. As concomitant coronary artery disease alters management strategy, it is suggested that each patient with history of Rheumatic Heart disease and undergoing valvular surgery, should be evaluated for CAD. It is also compulsory that every setup should have their observation in order to know the occurrence of the disease.

STUDY LIMITATIONS:

The lesion in CAD was not defined, whether 50% stenotic artery was defined significant. The association of single, double and three vessel CAD should be stratified. The involvement of LMS, LAD, LCX and RCA should be included.

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