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COULD SEVERE VALVULAR HEART DISEASE BE A PREDICTIVE FACTOR FOR CORONARY HEART DISEASE: EXPERIENCE OF DEPARTMENT OF CARDIOLOGY B – RABAT ABOUT 120 CASES?

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ABSTRACT

This study aims to evaluate the prevalence of significant coronary artery disease (CAD) in patients with severe valvular heart disease (VHD), and the association between these two cardiac entities. **Methods:** A retrospective study was conducted on 100 consecutive patients who underwent surgery for severe VHD in the cardiovascular department of Ibn Sina University Hospital if Rabat, between December 2020 and December 2022. According to transthoracic echocardiography, patients were divided into 4 groups: patients with severe aortic stenosis (AS), patients with severe aortic regurgitation (AR), patients with severe mitral stenosis (MS), and patients with severe mitral regurgitation (MR). Preoperative coronary angiographies were reviewed for the presence or the absence of significant CAD. **Results:** Of the 120 patients with severe VHD, 43 patients had isolated aortic valve disease, 57 patients had isolated mitral valve disease, and 20 patients had combined aortomitral valve disease. CAD was detected in 34.16% of all patients with severe VHD, in 48% of patients with isolated aortic valve disease, and in 8% of patients with isolated mitral valve disease. Statistical analysis showed a higher prevalence in patients with severe aortic valve stenosis and a significant relationship between CAD and aortic valve disease, mainly in AS. **Conclusion:** The prevalence of CAD in patients with VHD is 34%, and it correlates significantly with aortic valve disease, in particular with severe AS.

KEYWORDS: Coronary artery diseases, valvular heart disease; aortic stenosis.

INTRODUCTION

Cardiovascular disease (CVD) is the primary cause of death worldwide, with CAD and VHD being significant contributors to major cardiovascular events. Currently, the causes of valvular heart diseases have shifted from primarily rheumatic factors to degenerative ones, which increase with age, especially in Europe and North America. However, rheumatic valvular disease remains prevalent in Morocco.[1] In the Eastern Mediterranean Region; the most common cardiac disorders in 2015 included 4.5% rheumatic disease. Researchers have noted a complex relationship between CAD and VHD, despite both conditions sharing common risk factors such as aging, hypertension, and smoking. Our study aimed to retrospectively assess the prevalence of concurrent CAD in patients who underwent surgery for severe VHD and to explore the association between CAD and the type of valvular heart disease.[2]

MATERIAL AND METHODS

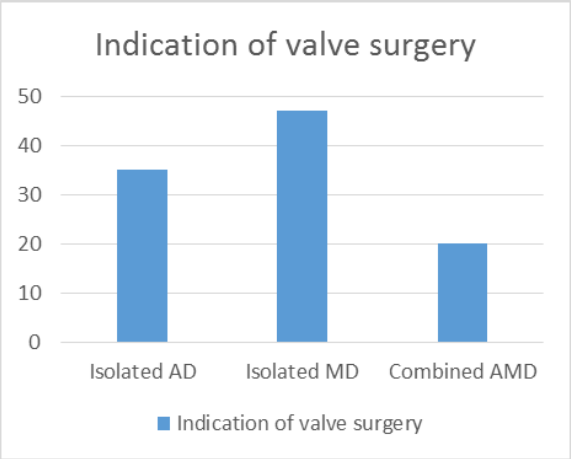
Retrospective study was carried out on 120 consecutive patients who underwent surgery for severe VHD at the cardiovascular department of Ibn Sina University Hospital in Rabat, from December 2020 to December 2022. Based on transthoracic echocardiography results, patients were categorized into four groups: those with severe aortic stenosis (AS), severe aortic regurgitation (AR), severe mitral stenosis (MS), and severe mitral regurgitation (MR). Preoperative coronary angiographies were reviewed to identify the presence or absence of significant CAD. Both transthoracic echocardiography and coronary angiography were reviewed by the same reference doctors in the cardiovascular department. Among the 120 patients, 55% were female (66 patients). The study excluded patients with known coronary artery disease or coronary bypass, those under 18 years of age, patients who did not undergo coronary angiography, those with mitral regurgitation due to ischemic etiology, patients with mild or moderate VHD, re-operated cases due to prosthesis valve dysfunction, and those with a history of valvular repair or balloon valvuloplasty.

RESULTS

Among the 120 patients with severe VHD, 43 had isolated aortic valve disease, 57 had isolated mitral valve disease, and 20 had combined aortomitral valve disease. Out of the 43 patients with aortic valve disease, 35 (81%) had AS, while 8 had AR. Among the 57 patients with primary mitral valve disease, 50 had MS and 7 had MR.

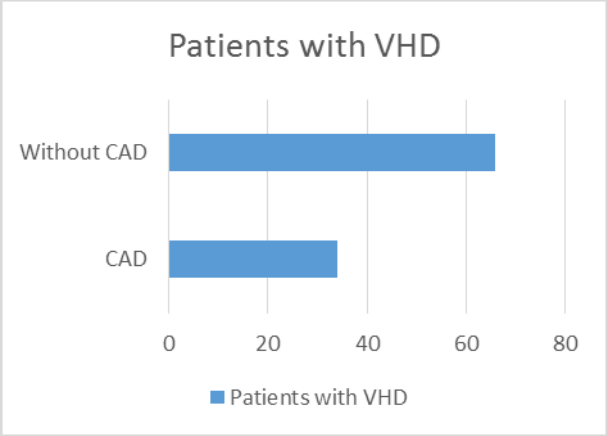
Statistical analysis shows the highest prevalence of CAD in the group of patients with severe AS and a higher significant relationship between CAD. Concerning the gender, no significant difference was found between males and females, but the association between CAD and severe AS was more common in male gender (60 % of patients were male, and 40 % were females) and in patients with multiple risk factors (80% had hypertension, 65 % had diabetes, 60% had dyslipidemia, and 54% were smokers).

Table 1: Indication for valve surgery.



CAD was found in 34.16% of all patients with severe VHD, with 48% of those having isolated aortic valve disease and 8% of those having isolated mitral valve disease. Statistical analysis revealed a higher prevalence of CAD in patients with severe aortic valve stenosis and a significant association between CAD and aortic valve disease, particularly in AS. There was a significant difference in the presence of CAD between the groups. CAD was more prevalent in patients with AS compared to those with MS, and higher in patients with MR compared to those with MS.

Table 2: Prevalence of CAD in patients with VHD.



Of the 57 patients with isolated mitral valve disease, 50 (87%) patients presented severe MS, of whom 6 (12%) had significant CAD, and 7 (13 %) patients presented severe MR, of whom 2 (28%) had significant CAD. Of the 43 patients with isolated aortic valve disease, 35 (81%) patients presented severe aortic stenosis, of whom 18 (51.4 %) had significant CAD, and 8 (19%) patients presented severe aortic regurgitation, of whom 1 (12.5%) had significant CAD.

Table 3: Prevalence of CAD in aortic and mitral valve disease.

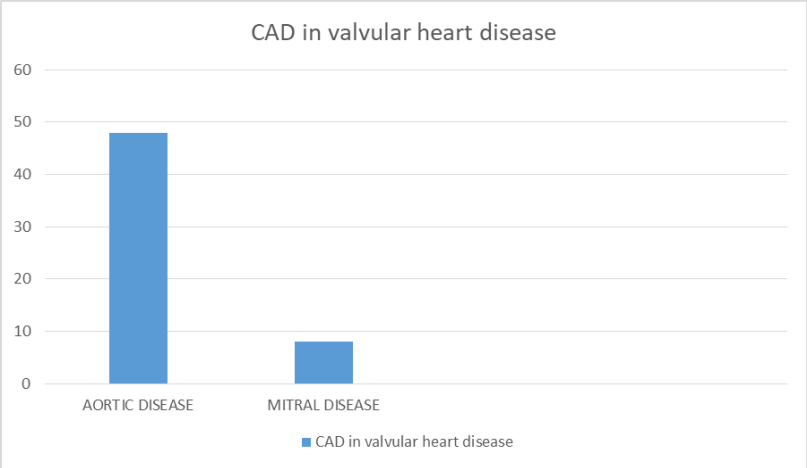
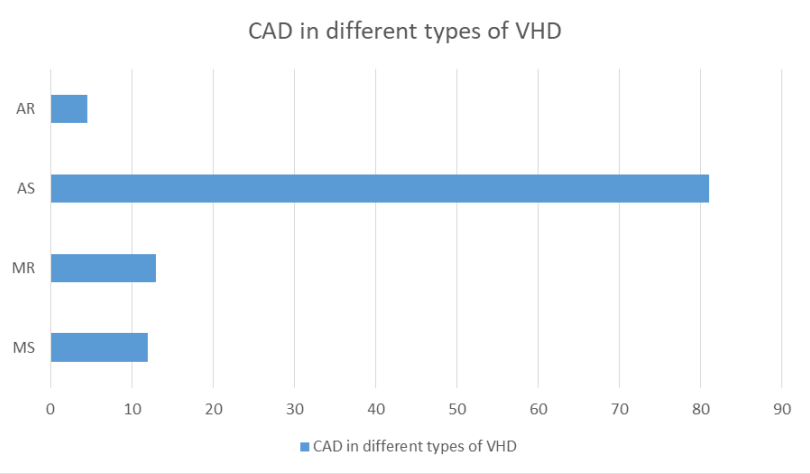


Table 4: Prevalence of CAD in VHD subtypes.



DISCUSSION

A literature review reveals that the prevalence of CAD in patients undergoing valve replacement varies significantly, ranging from 9% to 41%. For instance, Marchant et al. found a 14% prevalence by analyzing the electrocardiograms (ECG) of 100 patients.[3] Shaikh et al. reviewed the medical records of 144 patients, reporting a 25% prevalence of CAD.[4] Manjunath et al. identified an 8.7% prevalence by studying 300 patients referred for

cardiac surgery for non-coronary lesions.[5] Cazelli et al. noted a 20% prevalence of obstructive CAD in the preoperative period for patients with VHD.[6]

In another study of Anthony Mattaa et al. Among the 1308 patients studied with severe VHD, 1002 patients had isolated aortic valve disease, 240 patients had isolated mitral valve disease, and 66 patients had combined aortomitral valve disease. CAD was detected in 27.75% of all patients with severe VHD, in 32% of patients with isolated aortic valve disease, and in 15% of patients with isolated mitral valve disease.[1]

Our study is particularly important because it focused on a younger population with a higher frequency of rheumatic etiology compared to other studies. Despite the heterogeneity of our group, CAD prevalence was higher in patients with aortic valve disease, particularly those with severe aortic stenosis (AS). This high prevalence can be attributed to the role of the atherosclerotic process in both AS and CAD. The risk factors for developing a calcified aortic valve, such as high low-density lipoprotein cholesterol, diabetes mellitus, smoking, and hypertension, are similar to those for vascular atherosclerosis. Further prospective studies are needed to explore the potential causal relationship between CAD and AS, and to determine if improving CAD prevention and management could reduce the incidence of AS.

CONCLUSION

In the present study there was significant difference between the groups in terms of the presence of CAD. The prevalence of CAD was higher in patients with AS when compared to patients with MS The high prevalence of CAD in patients with AS reflects the role played by the atherosclerotic process in the etiology of AS. The findings of the present study in terms risk factors for CAD are similar to those reported in the literature.

Competing interests

In terms of our authors, we certify to take all public responsibility for the contents, and all the authors have contributed substantially to the drafting and have approved the final version. None of the authors has any conflicts of interest with the contents.

Author Contributions

E.R is responsible for creation, editing and writing of manuscript including submission. F.J B.N and Z.G are responsible for data collection, editing and writing of manuscript. D.N and C.M are responsible for final editing, proof reading and revision of manuscript.

Patient consent

Not applicable.

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