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MANAGEMENT OF VALVULAR HEART DISEASES

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Abstract
'Management of Valvular heart diseases' focuses on the prevalence of different valvular heart diseases (VHD) and the way such patients are managed in health care vicinity. Aim was to analyze patients for the type of VHD, their causes, risk factors associated with the disease, symptoms, surgical interventions of the patients, pre and post-operative care and the drug therapy given. A retrospective study carried out in a cardiac hospital. Method; a total of 45 patients hospitalized at Punjab Institute of Cardiology, Lahore were studied during the month of June, 2010. Results; About 37.85% of patients are diagnosed with VHD during 21-40 years followed by patient above 40 years. Males are usually more susceptible to VHD and accounts for 60% of total patient population. Poor socioeconomic status showed more influence on occurrence of VHD. Mostly mechanical valve is preferred for replacement as compared to the tissue valve. Rheumatic heart disease (40%) is the most common cause of VHD. Valvular stenosis and insufficiency are the common types of VHD. Conclusion; Diseases of the heart valves include a diverse group of acquired and congenital lesions. Patients come with symptoms of shortness of breath, palpitations and fever. Fewer patients are lesser compliant to drug therapy. Follow-up and maintenance of international normalized ratio (INR) improves patient outcome as well as survival by enhancing the lifelong function of valve.

Key words: *International normalized ratio, mitral valve, palpitations, rheumatic heart disease, valvular heart disease.*

INTRODUCTION

Valvular heart disease (VHD) encompasses a number of common cardiovascular conditions that account for 10% to 20% of all cardiac surgical procedures. Appropriate work-up for patients with VHD includes a thorough history for evaluation of causes and symptoms, accurate assessment of the severity of the valvular abnormality by examination, appropriate diagnostic testing, and accurate quantification of the severity of valve dysfunction and therapeutic interventions, if necessary. Role of the therapeutic interventions Vs the natural history of the disease in the assessment of outcomes is important [1].

The left ventricular (LV) dimensions, function and the presence and severity of heart valvular disease is evaluated by echocardiography. Significant valvular heart disease includes mitral or aortic stenosis severity, moderate or severe mitral regurgitation, moderate or severe aortic regurgitation and moderate or severe tricuspid regurgitation. Mitral regurgitation and aortic regurgitation are the most frequent valve diseases [2].

No difference in the frequency of moderate or severe valve disease between men and women exists but women are less often diagnosed than are men. Prevalence increased with age, in 18—44 year olds to 75 years and older group [3]. VHD mainly results from rheumatic fever. Rheumatic fever is a preventable disease, but the combination of a lack of resources, lack of infrastructure, political, social and economic instability, poverty, overcrowding, malnutrition and lack of political will contributes to the persistence of a high burden of rheumatic fever, rheumatic VHDs and infective endocarditis [4].

Aortic regurgitation (AR) is characterized by diastolic reflux of blood from the aorta into the left ventricle (LV). Acute AR typically causes severe pulmonary edema and hypotension and is a surgical emergency. Chronic severe AR causes combined LV volume and pressure overload [5].

Assessment on the basis of Specific Activity Scale (SAS) classification, transthoracic echocardiography, and treadmill exercise testing using the modified Bruce protocol shows a significant proportion of patients with apparently asymptomatic aortic stenosis experience limiting symptoms on treadmill exercise testing. The subsequent development of spontaneous symptoms is strongly related to the severity of stenosis and to limiting symptoms on exercise testing, but less so to an

abnormal blood pressure response or ST segment depression [6]. Echocardiography remains the gold standard for diagnosis and periodic assessment of patients with valvular heart disease [7].

In patients with aortic stenosis who develop the classic symptoms of angina, syncope, or dyspnea, prompt aortic valve surgery should be performed to prevent sudden death. Thus, aortic valve replacement should be performed within 30 days after symptoms develop. Asymptomatic patients with severe aortic stenosis can be managed medically [8].

Treatment may be with medication but often (depending on the severity) involves valve repair or replacement (insertion of an artificial heart valve). Drug therapy plays a key role in the management of valvular heart disease, though in many cases it does not alter its course or delay the need for surgery. The importance of drug therapy lies in stabilizing the patient's condition when the disease is due to abnormal valve structure, and in treating the underlying condition when the condition is due to a functional abnormality. Drug therapy also lowers the risk of bacterial endocarditis and rheumatic fever [9].

Only the extent of valve calcification is an independent predictor of outcome, whereas age, sex, and the presence or absence of coronary artery disease, hypertension, diabetes, and hypercholesterolemia are not. The presence of moderate or severe valvular calcification, together with a rapid increase in aortic-jet velocity, identifies patients with a very poor prognosis [10].

Balloon valvuloplasty is an effective intermediate palliation for aortic stenosis and is an acceptable alternative to surgical valvotomy [11]. Open valvotomy remains the gold standard in the management of AS in neonates, infants and older children. It is associated with low operative mortality and provides lengthy freedom from recurrent AS and regurgitation [12]. Pregnant patients with mechanical valves require careful attention to ensure maternal survival. Congenital submitral aneurysms are a unique cause of mitral regurgitation [13].

MATERIAL AND METHODS

45 patients suffering from valvular heart diseases admitted to Punjab Institute of Cardiology, Lahore during the month of June, 2010 were studied. Different parameters on sociodemographic basis including age, gender, socioeconomic status, causes, diagnosis, risk factors, past medical history, chief complaints, drug therapy, lab results and tests, surgical procedures were documented.

Couple of days before valvular surgical procedure, patients were admitted to the hospital. Patients were advised not to eat or drink after midnight the night before surgery, to reduce the risk of vomiting while asleep. Smoking should be stopped at least two weeks prior to surgery, as smoking can contribute to blood clotting and breathing problems. Valve surgery was conducted under a general anesthetic. Surgeons must stop the heart to work on the valve or valves. To ensure continuous flow of oxygen-rich blood, a heart-lung machine is used. Surgery used to take 2 to 4 hours, depending upon the number of valves that need to be repaired or replaced. After surgery, patients were shifted to ICU and stayed in the hospital for about a week.

In valvuloplasty, a small balloon was inserted and inflated to stretch and open stenosed heart valve. It was performed in cath. Lab for up to four hours. A local anesthetic was injected in groin. Guided by a video camera, the cardiologist inserted a catheter through artery or vein depending on where the problem lies. Once the catheter was in place, a balloon tipped catheter was slowly threaded through the first catheter; the deflated balloon was repeatedly inflated to open the valve leaflets apart. Once the valvular opening has been widened enough, the balloon tipped catheter was removed while the first catheter was left in place in case the procedure needs to be repeated.

RESULTS

45 patients of different age groups in cardiac hospital were studied. Fig. I reveals that most of the patients are diagnosed during the age of 21-40 years (37.8%), 28.90% of upto 20 years and 33.30% were diagnosed at age above 40

years. Fig. II shows that 60% of the patients diagnosed are male. Fig. III depicts that in most of the valve replacement cases, mechanical valve (91.1%) is used.

Fig. IV explains that valve which is mostly at risk is mitral valve (46.7%) followed by DVR 28.9%, aortic valve (22.22%) and tricuspid valve (2.22%). Fig. V indicates that 40% of patients with rheumatic heart disease suffer from VHD whereas infective endocarditis affects 11.1% of patients, MVP 4.4% and congenital cases admitted to hospital are 2.2%.

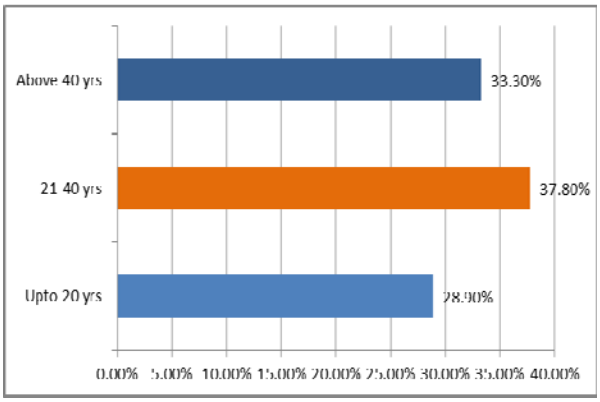

Fig I: Prevalence of VHD in different age groups

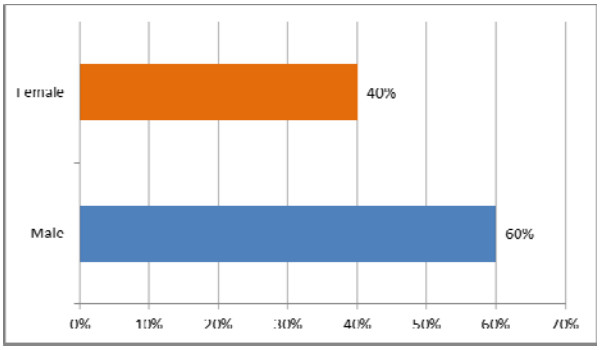

Fig II: Gender

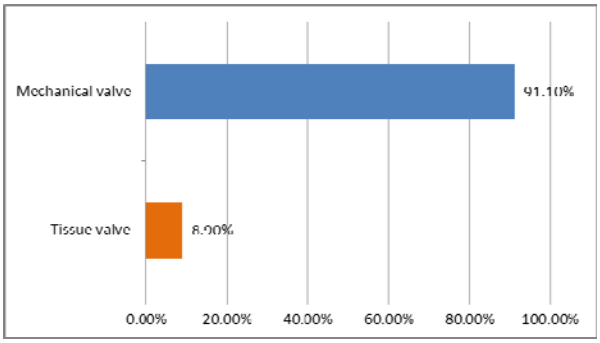

Fig III: Common valves used for replacement

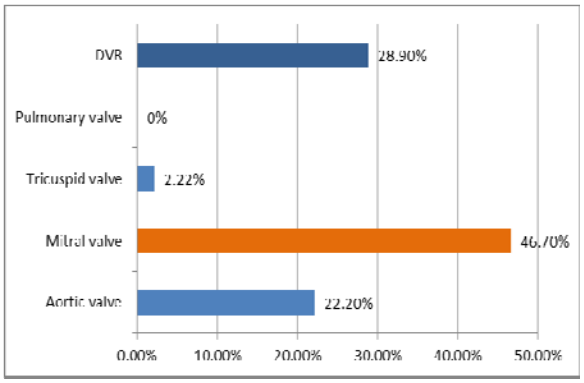

Fig IV: Valves at high risk

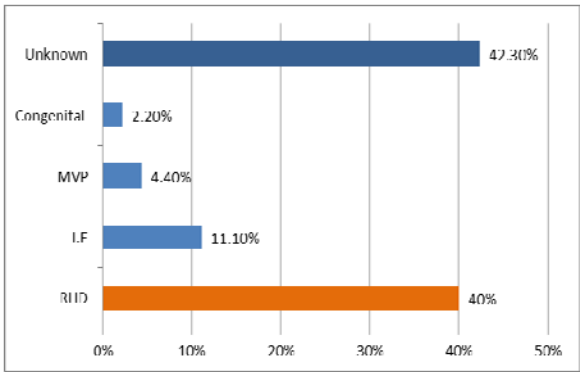

Fig V: Causes of valve diseases

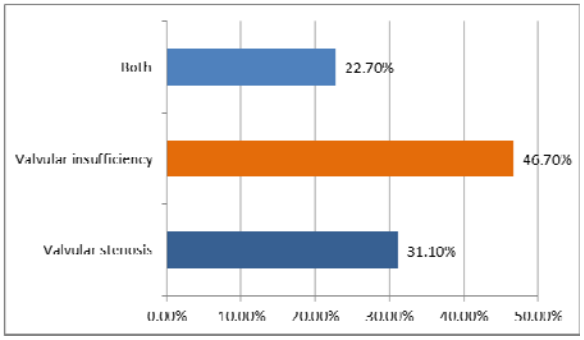

Fig VI: Types of valve disease

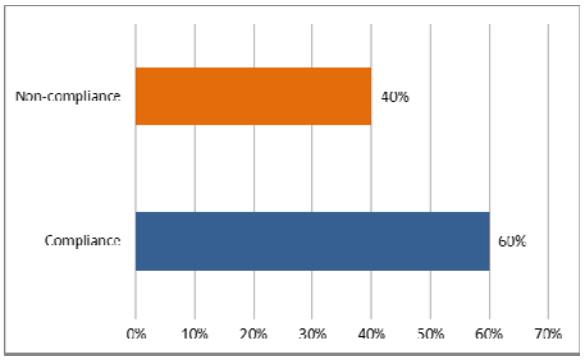

Fig VII: Patient compliance to drug therapy after surgery

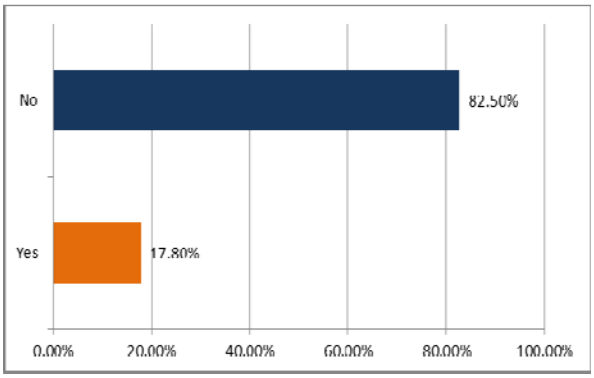

Fig VIII: Ratio of redo of valve replacement

Fig. VI states that occurrence of valvular insufficiency is more common in patients (46.7%) while valvular stenosis is less in percentage (31.1%). Fig. VII gives an idea about patient compliance that 60% of patients show compliance to drug therapy. Fig VII reveals that 82.5% of patients have to undergo redo of valve replacement due to different reasons

DISCUSSION

Valvular heart disease is a leading cause of morbidity and mortality. Valvular disease ranks among the major cardiovascular afflictions. Significant valvular heart disease includes any mitral or aortic stenosis severity, moderate or severe mitral regurgitation, moderate or severe aortic regurgitation and moderate or severe tricuspid regurgitation. Valve problems may be congenital (inborn) or acquired (due to another cause later in life). Treatment may be with medication but often (depending on the severity) involves valve repair or replacement (insertion of an artificial heart valve).

Symptoms of valve diseases include shortness of breath and/or difficulty in breathing, weakness or dizziness, discomfort in chest, palpitations, swelling of ankles, feet or abdomen(edema), wheezing after limited physical exertion, chest pain (may be mild), fatigue, dizziness or fainting (with aortic stenosis), fever (with bacterial endocarditis) and rapid weight gain.

Diagnosis of heart valves include physical exam listening to heart sounds (murmur) as the valve open and close. Most important diagnostic tests are echocardiography, cardiac catheterization, radionuclide scans, magnetic resonance imaging (MRI), stress testing to measure blood pressure, heart rate, ECG changes and breathing rates during exercise. Three goals of treatment for heart valve disease: protecting valve from further damage, lessening symptoms and repairing or replacing valves. Rheumatic heart disease and infective endocarditis are important factors towards occurrence of valvular heart disease.

Patient may be prescribed medications to treat symptoms and to lessen the chance of further valve damage. Some medications may be stopped after patient had valve surgery to correct their problem. Other medications may need to be taken for whole life. Medications used are Diuretics, Anti arrhythmic medications, Vasodilators, ACE inhibitors, Beta blockers, Anticoagulants and Antithrombotic agents.

Valves can be repaired or replaced with traditional heart valve surgery or a minimally invasive heart valve surgical procedure. Replacement valves may be artificial or made from animal tissue. Tissue valves are preferred as they do not require life-long use of anticoagulants. But as far as wear and tear is concerned, mechanical valves are more advantageous. Heart valves may also be repaired by other procedures such as percutaneous balloon valvotomy.

Prevention of disease by prompt treatment for a sore throat that lasts longer than 48 hours, especially if accompanied by a fever. Timely administration of antibiotics may prevent the development of rheumatic fever which can cause valvular heart disease.

Conclusion

VHD may be congenital or acquired that may be either due to valvular stenosis or valvular insufficiency. Young patients are more in number, reason being some of them carry the disease since childhood as a congenital anomaly. As poverty brings so much other problems, VHD also prevails in such population. Mitral valve is the high risk valve

for developing the disease. RHD is the leading factor in prevalence of disease and a lot of patients develop the disease even after surgical intervention at some stage of their lives. This happens either due to some abnormality in patients' valve physiology or in case of valve replaced by mechanical valve, anticoagulation therapy non-compliance is a key factor. Pharmacist, being an important member of healthcare team, plays most important role in drug therapy management and in a broader sense, in increasing patient compliance which is ultimately good for patient's healthy life.

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