



Editorial

Predictors of mortality in chronic rheumatic heart disease

Rheumatic heart disease (RHD) is still a common cardiovascular problem in developing countries. Global estimates suggest that 62-78 million individuals may have RHD with potential deaths of above 1.4 million per year from the disease and its complications¹. A significant number requires repeated hospital admissions because of heart failure (HF) and other complications of valvular heart damage. Increased mortality particularly occurs in the younger population and in resource-poor countries. There are limited data available regarding population-based mortality. In a retrospective study from Ethiopia, 26.5 per cent of all cardiovascular deaths were due to RHD, and in 70 per cent of these patients, the deaths were attributable to HF². The predictors of mortality in RHD are related to the following factors: (i) socio-economic factors; (ii) valvular damage severity and its haemodynamic consequences; and (iii) factors related to tertiary care for the rheumatic valvular disease.

Socio-economic factors

The socio-economic factors are important both for the occurrence and severity of the disease and affect the mortality. Malnutrition and crowded living conditions make children prone to throat infection with Group A streptococcal infection resulting in rheumatic fever in some cases³. Valvular damage occurs as a result of an immune response to streptococcal infection. Recurrent episodes of rheumatic fever further worsen the valve damage. Hence, secondary prophylaxis with long-acting penicillin is helpful to prevent the recurrence of rheumatic fever and further valvular damage⁴.

Because of the poor socio-economic status, many such patients do not have access to optimum treatment including penicillin prophylaxis as well as other medical and surgical treatment modalities. Consequently, valvular damage causes haemodynamic abnormalities and premature death.

The decline in RHD in developed countries is because of improved living conditions and access to required timely antibiotic administration. The decline in cause-specific mortality over 1997-2012 in South Africa is consistent with this hypothesis, reflecting both a decline in incidence and improved survival with access to medical and surgical treatment in prevalent cases⁵.

Severity of valvular damage and its haemodynamic consequences

The mitral valve (MV) is the most common valve involved and is associated with aortic valve involvement in 20-30 per cent of the cases. Tricuspid and pulmonary valves are rarely involved. Mitral stenosis may manifest at a younger age in developing countries and has been termed as 'Juvenile mitral stenosis'⁶. Variables that correlate with severity of valve disease include the number of previous attacks of rheumatic fever and the length of time between the onset of disease and start of therapy. The valvular damage results in regurgitation, stenosis or combined lesions resulting in HF, arrhythmia, embolic complications and development of pulmonary arterial hypertension (PAH). These complications affect/predict the mortality in patients with rheumatic valvular disease.

Heart failure (HF): HF is related to severity of the valvular damage and the length of disease. The myocardium is well preserved in these cases⁷. Surgical treatment or mitral balloon dilatation, as per the requirement, helps improve and reverse the HF in these patients. Acute HF due to RHD is associated with a high case fatality rate affecting a third of patients within a year of diagnosis⁵. Thus, optimal access to treatment including surgical treatment is important in these patients to improve survival. Prolonged haemodynamic load secondary to valve lesion particularly regurgitation may result in left ventricular dysfunction and may affect the outcome of surgery in such patients. Perioperative

predictors of death include right HF, impaired left ventricular function and increased left ventricular filling pressures⁸. Thus, early surgical treatment is important in these patients to improve the outcome. Amongst patient admitted with HF, nearly 20 per cent die within two months, if not surgically corrected.

Arrhythmia: Atrial fibrillation (AF) is a common arrhythmia seen in patients with mitral stenosis. This is related to dilatation of left atrium. The onset of AF worsens the haemodynamic status as well as becomes a trigger for clot formation and cardioembolic complications. A massive stroke can be a fatal event. RHD is a common cause of stroke in developing countries⁹. An embolism is common in patients with mitral stenosis and AF (transient or persistent). Both morbidity and mortality can be prevented by the use of oral anticoagulants¹⁰.

Ventricular arrhythmia may occur in late stages or secondary to drugs such as digitalis¹¹ and electrolyte abnormalities as a result of diuretics. Ventricular arrhythmias, if not treated timely, can sometimes result in ventricular tachycardia/ventricular fibrillation and sudden death. Close monitoring of digitalis level and electrolytes is important to take preventive steps.

Pulmonary arterial hypertension (PAH): PAH is mainly reactive and results from the haemodynamic effect of mitral stenosis/regurgitation. Significant PAH is usually a result of prolonged haemodynamic effect of untreated valvular lesions. Early correction of the lesion helps reverse the PAH. PAH persisting for a longer time may result in right ventricular (RV) dysfunction and functional tricuspid regurgitation. PAH and RV dysfunction increase the perioperative risk in patients undergoing MV surgery⁸. PAH also makes these patients prone to digitalis toxicity, and use of digoxin in these cases should be carefully monitored.

Infective endocarditis: Mitral or aortic valve damaged by infective endocarditis may also be serious and if not timely treated, can be fatal. Hence, it is recommended to give antibiotic prophylaxis to these patients whenever they are undergoing minor surgical procedures such as dental manipulation/extraction. A recent worsening of cardiac failure or development of prolonged fever is an indication for work up for bacterial endocarditis¹².

Factors related to tertiary care

Prevention of rheumatic fever by improving sanitation, environment, nutrition and providing early treatment for throat infection are important public

health measures to reduce the disease burden. Both drugs and surgical facilities are needed to reduce morbidity and mortality in these patients. Amongst drugs, benzathine penicillin is on the essential list of the WHO for secondary prophylaxis¹³; however, the supply of this drug in our country is inconsistent and thus needs effective government intervention for the smooth supply and optimum facilities for its safe administration.

Lack of cardiosurgical facilities in different parts of the country is also a major issue to effectively treat these patients. Such facilities are limited only in some major cities. Further, these facilities are costly and hence beyond the reach of most of patients because of affordability factor. Thus, there is a need to strengthen both medical and surgical facilities in the public sector and to ensure availability of required facilities at an affordable cost for everyone. The availability of optimum care following valve replacement particularly monitoring for anticoagulant therapy is important. Prosthetic valve thrombosis as a result of poorly followed anticoagulant therapy is a serious complication which may even result in stuck valve with significant mortality risk^{14,15}.

There is an unmet need to address the social factors and include the screening and treatment of RHD in school health programme. There is also a need to strengthen tertiary care services in the government medical colleges and hospitals to provide quality tertiary care services to these patients at an affordable cost. Prospective long-term follow up and effective treatment are required for the achievement of 25 per cent mortality reduction by the year 2025 that has been mandated by the World Heart Federation¹⁶.

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