Mitral stenosis still a concern in heart valve diseases

Le rétrécissement mitral : une valvulopathie encore d’actualité

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In Western countries, valvular heart diseases are mainly the result of so-called degenerative aetiologies, which has consequences for patient characteristics and the way in which the different types of heart valve disease are distributed [1,2]. Aortic stenosis and mitral regurgitation are now the most frequently occurring heart valve diseases in Western countries; their prevalence is low below the age of 65-years and increases sharply thereafter. Conversely, there has been a decrease in the prevalence of mitral stenosis, which is the only heart valve disease that is still caused predominantly by rheumatic fever. Nevertheless, mitral stenosis has not disappeared in Western countries, where it still accounts for more than 10% of single native valve diseases [1]. In addition, it remains a major public health issue in developing countries.

In this issue of the Archives of cardiovascular diseases, a paper by Marijon et al. highlights the diversity in the characteristics of patients presenting with mitral stenosis worldwide [3]. Although there have been a number of series on percutaneous mitral commissurotomy originating from Western and developing countries, this is the first study designed specifically to compare patient characteristics and the results of percutaneous mitral commissurotomy in seven countries from the five continents. All participating centres were high-volume centres, which limits the bias inherent in such an observational study. In comparison with patients from Western countries, patients from developing countries were markedly younger, had more severe valve stenosis and less frequent atrial fibrillation. Despite differences in patient presentation, there were no differences in the immediate results of percutaneous mitral commissurotomy.

These findings highlight major differences in the spectrum of rheumatic heart disease across developing and Western countries. Probably the most important difference is related to prevalence. Series from India and Pakistan have reported a prevalence of chronic rheumatic heart disease of around 5 per 1000 in schoolchildren [4,5]. According to
the World Health Organisation, prevalence rates are estimated at between 2 and 15 per 1000 in schoolchildren and adolescents in Africa [6]. These figures are likely to be underestimated as they are generally obtained using clinical screening, with or without confirmation by echocardiographic examination. It has recently been shown that systematic echocardiographic screening leads to higher prevalence rates. In a series of 5847 children from Cambodia and Mozambique, the respective prevalences of rheumatic heart valve disease were estimated at 21.5 and 30.4 per 1000 using systematic echocardiographic screening, whereas the corresponding estimations were 2.2 and 2.3 per 1000, respectively, using clinical screening alone [7]. Conversely, the prevalence of rheumatic heart valve disease is estimated to be less than 0.5 per 1000 in Western countries.

Unequal burden of streptococcal infections is the main cause of differences in the prevalence of rheumatic heart disease between countries. Poor socioeconomic environment is an important factor in promoting the spread of streptococcal infections, which is further exacerbated by an inadequate health system, leading to missed diagnosis and a lack of implementation of secondary prevention measures. Streptococcal infection burden is also a strong determinant for the progression from acute carditis to severe chronic rheumatic heart valve disease. In a prospective study from Brazil, a multivariable analysis identified three predictive factors of progression towards severe chronic rheumatic heart valve disease: the severity of initial carditis; recurrences of acute rheumatic fever; and low maternal educational level [8].

The more rapid progression of valve lesions in countries where streptococcal infection burden is high accounts for the younger age and smaller valve areas observed in patients with severe symptomatic mitral stenosis in the paper by Marijon et al. [3]. The older age and less severe degree of mitral stenosis in patients presenting with rheumatic heart disease in Western countries can be related to two main factors, which are linked to the decrease in the incidence of acute rheumatic fever:

- patients were children or adolescents when rheumatic fever was still endemic in Europe and the United States;
- they experienced a subsequent slower progression of their valve disease.

There is growing evidence, however, that the relationship between streptococcal infection and rheumatic heart disease is not straightforward. There is an important variability in individual susceptibility to rheumatic fever, which raises the question of the possible involvement of other environmental or genetic factors [6,9]. None of these possible cofactors has been clearly identified. The female predominance in all seven centres in the study by Marijon et al. is an illustration of the heterogeneous susceptibility to rheumatic fever, which is consistent with other series but remains unexplained. The involvement of factors other than Streptococcus in the development of rheumatic heart disease has important implications for prevention strategies and may provide an explanation for the failure of prevention of acute rheumatic fever based on antibiotic prescription alone.

Given the persisting high prevalence of rheumatic fever and the shortcomings of prevention strategies in developing countries, it is therefore expected that chronic rheumatic heart valve diseases—particularly mitral stenosis—will remain prevalent in the near future. This is particularly true for developing countries but will also concern Western countries as a result of immigration.

Besides patient presentation, the other main finding of the paper by Marijon et al. confirms the efficacy of percutaneous mitral commissurotomy in a wide range of patients. The consistently low rate of complications in these seven high-volume centres is further proof of the safety of percutaneous mitral commissurotomy in experienced hands. The availability of a conservative procedure is of particular importance in developing countries because of the drawbacks of heart valve prosthesis. Structural deterioration of bioprosthesis occurs rapidly in young patients—even more so in the mitral than in the aortic position—and lifelong anticoagulant therapy is difficult to manage in this context. Randomized series have shown that the long-term results of percutaneous mitral commissurotomy are at least as good as those of surgical commissurotomy [10]. However, surgical or percutaneous mitral commissurotomy remains a palliative procedure because valve remodeling is a persisting process over time in chronic rheumatic heart valve diseases. Thus, the possibility of repeating percutaneous mitral commissurotomy is attractive in young patients, in whom it avoids repeated surgical interventions. Although it is a particularly appropriate procedure in developing countries, percutaneous mitral commissurotomy is underused because of economic constraints, which explains why closed-heart commissurotomy remains a widely-used treatment in these countries [11].

Most patients from Western countries have less favorable presenting characteristics for percutaneous mitral commissurotomy than younger patients from developing countries. Nevertheless, they may derive a benefit from percutaneous mitral commissurotomy, provided that patient selection takes into account all their characteristics, including, but not overemphasizing, echocardiographic analysis of valve anatomy [12]. The safety of percutaneous mitral commissurotomy is also an incentive to consider intervention at an early stage of the disease in patients who present with favorable characteristics [12]. In addition, the low risk inherent in percutaneous mitral commissurotomy makes it a useful procedure in patients who are at particularly high risk for surgery.

At the present time, when most attention on heart valve diseases is focused on aortic stenosis and mitral regurgitation, one must not forget that rheumatic heart diseases, in particular mitral stenosis, remain highly prevalent worldwide and are still encountered in Western countries. This justifies a continuing awareness to allow for timely intervention, particularly given the availability of percutaneous mitral commissurotomy, which enables effective treatment to be performed at low risk in a wide range of patients. Percutaneous mitral commissurotomy is now a well-established technique, which has not replaced surgery but complements it at different stages of the disease. This has been made possible as a result of continuing prospective evaluations of the technique performed by experienced centres. The need for thorough evaluations of new techniques should be underlined given the current development of new percutaneous approaches in the treatment of heart valve diseases.
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References


