Short Communication

Trend of Rheumatic Heart Disease Prevalence in Bangladeshi Children

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Abstract

A review of all the population and school based studies indicate that prevalence of RHD has been declining in Bangladesh, from 7.5 per 1000 in 1977 to 0.3 per 1000 in 2005. No study is available for last 10 years. A regression line (exponential) has been drawn using prevalence points of all the studies identified. Although the line is very close to the ground, it will presumably take another decade or two to touch the zero line. Studies at five years interval are needed to monitor the trend of RHD.

BACKGROUND

Rheumatic heart disease (RHD) is now unusual in most high-resource settings [1]. However, it remains endemic in some socioeconomically vulnerable populations in high-income countries and in low- and middle-income country settings. RHD is a disease of poverty having a strong link to childhood malnutrition [2] and over-crowding in dwelling houses [3]. It has been a big problem in Bangladesh even in 1980s. Eight in ten cardiac operations done in the national cardiovascular hospital were due to RHD. Considering the magnitude of the problem, the Government of Bangladesh undertook a RHD [4] control programme in 1988. Currently there are lines of evidences that RHD has declined substantially in Bangladesh [4] and still continued to decline. But the situation is yet to be analyzed systematically. We have reviewed all population/school-based studies to examine the secular trend of RHD in Bangladesh.

MATERIAL AND METHODS

All the articles published in peer reviewed journals were located through PubMed and Google search. A manual search in the libraries and contacting individual researches was also done to find out relevant article. A total of six articles were thus identified [5-10]. Studies done in population or schools were included in this review but hospital-based studies were not considered because they cannot provide population denominators. One study [11] having inadequate sample size was excluded from the trend analysis because it reported a ‘zero’ prevalence which is very unlikely. All the prevalence points, of selected articles, were plotted on a line graph (exponential) and a regression equation was obtained using Microsoft Excel.

RESULTS

The first population based study [5] was done in 1976. This study drew samples from worksite and hospital also. Thereafter several studies appeared in the literature till 2005 both from school [6-8] and population settings [9,10]. One study [5] did not mention anything about echocardiography, one study [8] did not use echocardiography but all others did it to confirm diagnosis of RHD. The first study [5] was done in all age groups but others were done in children (ages 5 to 19 years). The lined graph (Figure 1) shows a declining trend of RHD beginning from 7.5 per 1000 in 1975 to 0.3 per 1000 in 2005 in an exponential manner.

DISCUSSION

This systematic review of studies in Bangladeshi children reveals an impressive declining trend since 1976. Although there are methodological differences between studies, the decline is well convincing because similar decline has observed in hospitals also [12]. Therefore the declining trend reported here may reflect a true decline of RHD in Bangladesh.

There are several reasons for a decline in RHD prevalence in Bangladesh. During last three-four decades there has been a substantial improvement of poverty, sanitation and nutritional indicators [13] that are intimately linked to occurrence of rheumatic fever. The overall improving sanitary, housing and schooling conditions might have caused a decrease in throat infection in the community. Public awareness and early treatment of sore throat might have been improved due to intensive campaign done by the national programme for RHD prevention. A change in epidemiology of group A beta hemolytic streptococci has also happened [12] causing decrease in their virulence. Secondary prophylaxis for rheumatic fever has also been improved substantially [4].

The regression line presented here is very steep. This is partly due to an initial high prevalence in 1976 (7.5 per 1000). As noted...
above, this study recruited subjects from hospitals in addition to communities and worksites. Therefore it is understandable that the prevalence will be higher than community studies. Although the regression line is not very far from the baseline (‘zero’ prevalence), such lines remain flat for a considerable time before touching the ground because of sporadic hard to reach deprived group of people or un-expected outbreaks. These kind of cases, in most instances, remain difficult to be eliminated. Therefore it is presumed that RHD will continue to remain a public health concern for a decade or two Bangladesh considering continuous improvement of hosts’ nutritional status, housing and sanitary conditions and health system’s response to RHD, and a decreasing virulence of the agent (streptococci). The study by Majumder and colleagues done in 2005 has reported a ‘zero’ prevalence of RHD but this should be considered as a spurious finding because it is not supported by the other national level study conducted in the same year [10]. It did not have enough power to capture RHD cases because of small sample size of 997 school students.

RHD diagnosis at population level has historically relied on cardiac auscultation [10]. All Bangladeshi studies used auscultation method to do the primary screening that makes them comparable among themselves. This approach keeps the subclinical patients without clinical murmur. Use of portable echocardiography machines [14] could be part of the solution although concerns have been raised about its cost-effectiveness. Use of such screening tool may increase the prevalence estimates in Bangladesh, by adding subclinical patients without having clinical murmur [15], as has been done in other countries. A declining prevalence of RHD has also been reported from India and currently it prevalence in Kerala state was 2.4 per 100 school children. However it increased to 5.5 per 1000 after apply WHF’s criteria of echocardiography [16]. A recent review of RHD situation in Asian countries done by Jonathan Carapetis [17] indicates that recent studies are reporting lower prevalence in some countries than before. However RHD in general is indeed an ongoing problem in Asia.

CONCLUSION

In conclusion, the prevalence of RHD in Bangladesh has been declining continuously over several decades concurrent to economic emancipation and health system’s response to control RHD. Therefore prevalence studies are warranted soon, preferably using portable echocardiography, because the last one was done a decade ago in 2005.

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