

RHD Prevention Perspectives in Bangladesh

Rheumatic heart disease (RHD) prevention has become a feasible option with appropriate intervention in a favorable socioeconomic environment even in developing countries. Bangladesh is among the developing countries where the prevalence of RHD has been high a half century ago. In mid-1970s, a 7.5 per 1,000 population prevalence of RHD was reported [1]. Eight in 10 cardiac operations were done for RHD in the national cardiovascular hospital even in early 1980s. Appropriate public health measures to control RHD were seriously warranted. The government's response to combat the RHD epidemic in Bangladesh is shared here as a best practice example.

NATIONAL RESPONSE

The government of Bangladesh established the National Center for Control of Rheumatic Fever and Heart Diseases (NCCRFHD) in 1988. It has been implementing a comprehensive control program, although with frequent paucity because of resource constraints. It started functioning with a milestone study of RHD prevalence at population level: 1.3 (95% confidence interval [CI]: 0.4 to 2.2) per 1,000 rural children ages 5 to 15 years [2]. The NCCRFHD's interventions were found to be effective. A declining trend of RHD had been reported [3] by late 1990s. In the meantime, we (M. M. Zaman, S.R. Choudhury, A. H. M. S. Rahman, and J. Ahmed) conducted another large-scale national level study in 2005. RHD prevalence among children ages 5 to 19 years was 0.3 per 1,000 (95% CI: 0.2 to 0.5), which indicates a significant decline compared with the prevalence in the study done in early 1990s using a similar method [2]. Strategies used for RHD control follow.

Prophylaxis

RHD, a distant chronic sequel of rheumatic fever (RF), can be prevented by using antibiotics. Penicillin (or other antibiotics in penicillin-sensitive subjects) is used short term for treatment of streptococcal tonsillopharyngitis to prevent an initial attack of RF (primary prophylaxis). It is also used for a longer term for prevention of a recurrent attack in a child who already had an attack of RF (secondary prophylaxis). We (M. M. Zaman, N. Eshaque, M. K. Mohsin, M. A. Rouf, M. Hussain, K. M. H. S. S. Haque, A. Malik) developed a set of consensus guidelines for Bangladesh by considering the age distribution of Bangladeshi RF patients [4] and adapting the World Health Organization and American Heart Association guidelines. The salient features of the guidelines are presented in Table 1. These guidelines have been used in a stringent manner since their inception.

Socioeconomic factors

Improvement of socioeconomic conditions, diet in particular, was responsible for decrease of RF in the current developed countries even before penicillin became largely available. This emphasizes primary prevention of RF before its first occurrence. Bad housing was found to be associated with RF in Bangladesh [5] at the beginning of the NCCRFHD. Ongoing economic emancipation in Bangladesh [3] has led to improvement in living conditions including housing. This might have contributed to reduce crowding at households.

Diet and nutrition

Low height for age, an indicator for overall chronic nutritional deprivation, favored RF in Bangladeshi children [5]. Low intake of eggs and soybean oil [6] and low body iron store and albumin levels [7] had associations with RF. Therefore, nutritional education was an integral part of the community intervention and outpatient counseling.

Capacity building of health professionals

Ignorance and confusion among the doctors, nurses, and health workers were found to exist. They were trained to improve diagnosis, management, and prophylaxis of RF cases by the doctors, as well as the detection and referral of suggestive cases from the community by health workers.

Availability of and accessibility to health care

Penicillin and laboratory diagnostic facilities (e.g., measurement of erythrocyte sedimentation rate and anti-streptolysin O) and penicillin were made available in most public hospitals at no or minimum cost. Testing of anti-streptolysin O became popular in private hospitals also.

Registries and epidemiological surveys

There were RF/RHD registries in sentinel hospitals and health complexes of all divisions of the country. Registration of RF/RHD cases has been an important element because it has been proved to be cost-effective in other populations. Surveys were done to understand the ongoing epidemiology including the population level of streptococcal antibodies. Additionally, grouping and typing of streptococci were done periodically. Increasing use of penicillin might have reduced the prevalence and virulence of streptococci [3].

Awareness of the people

People were made aware about the role of appropriate diet and avoidance of overcrowding as far as practicable. Health seeking for sore throat has been promoted. Mass media were engaged for public awareness. Posters and

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TABLE 1. Guidelines for diagnosis, prophylaxis, and follow-up of streptococcal pharyngitis and RF patients of Bangladesh, July 2000

Disease	Drug	Duration
1. Primary prophylaxis: streptococcal pharyngitis	<ul style="list-style-type: none"> • BPG 600,000 U <30 kg, 1,200,000 U \geq30 kg body weight or • PPV 250 mg 2 to 3 times daily for <30 kg, 500 mg 2 to 3 times daily for \geq30 kg body weight <p>For individuals allergic to penicillin:</p> <ul style="list-style-type: none"> • ERN 20 to 40 mg/kg/day 2 to 3 times daily (max. 1 g/day) 	Once 10 days 10 days
2.1. Secondary prophylaxis: RF without carditis	<ul style="list-style-type: none"> • BPG 600,000 U <30 kg, 1,200,000 U \geq30 kg body weight every 3 week or • PPV 250 mg twice daily <p>For individuals allergic to penicillin:</p> <ul style="list-style-type: none"> • ERN 250 mg twice daily 	Up to 22 years of age or 5 years from last attack (whichever is longer)
2.2. Secondary prophylaxis: RF with carditis but no residual valvular lesion	As above	Up to 30 years of age or 10 years from last attack (whichever is longer)
2.3. Secondary prophylaxis: RF with carditis and residual valvular lesion (including those with artificial valve)	As above	Lifelong

BPG, benzathine penicillin G; ERN, erythromycin; PPV, phenoxymethyl penicillin V; RF, rheumatic fever.

stickers were displayed in hospitals and educational facilities. Messages were simple to alert people while avoiding panic. Communities were engaged through the rural health centers. Journalists were oriented to promote media reports. School teachers were trained to suspect streptococcal pharyngitis and RF and to refer the students to nearby health centers. All these measures have improved referral, case detection, and compliance to prophylaxis.

In conclusion, the interventions given by the NCCRFHD concomitant with the economic emancipation of the country have contributed substantially to a declining trend of RHD in Bangladesh. Presently, classical cases of RF have become a rare variety and most of the cases present with a milder form.

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