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Review Article

Rheumatic fever and rheumatic heart disease in Bangladesh: A review

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ABSTRACT

Rheumatic fever (RF) and rheumatic heart disease (RHD) are the most-common cardiovascular disease in young people aged <25 years, globally. They are important contributors to cardiovascular morbidity and mortality in Bangladesh. Classical risk factors, i.e. poverty, overcrowding, ignorance, and insufficient health care services were responsible for the high incidence and prevalence of these diseases over the last century. In concert with the progresses in socioeconomic indicators, advances in health sectors, improved public awareness, and antibiotic prophylaxis, acute RF came into control. However, chronic RHD continues to be prevalent, and the actual disease burden may be much higher. RHD predominantly affects the young adults, seriously incapacitates them, follows a protracted course, gets complicated because of delayed diagnosis and is sometimes maltreated. The treatment is often palliative and expensive. Large-scale epidemiological and clinical researches are needed to formulate evidence-based national policy to tackle this important public health issue in future.

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1. Introduction

Rheumatic fever (RF) and rheumatic heart diseases (RHDs) are important medical and public health issues, because they are common and are important causes of cardiovascular morbidity and mortality especially in developing world. Over 15 million people around the world suffer from RHD, which kills hundreds of thousands of people a year, and is the most common acquired heart disease in children and young people in developing countries.¹ Acute RF – the precursor to RHD – results from an abnormal autoimmune response to group A

beta-hemolytic streptococcus (GABHS) infection in a genetically susceptible host. It affects the heart, joints, brain, and subcutaneous tissue; however, when affected, heart valves bear the brunt of RF. Although penicillin is effective in the prevention of the disease, treatment of advanced stages uses up a vast amount of resources, which makes disease management especially challenging in emerging nations.²

Bangladesh has been experiencing epidemiological transition from communicable disease to non-communicable disease. The overall mortality has decreased significantly over the couple of decades. But deaths due to chronic diseases, specially the 'fatal four', i.e. cardiovascular disease (CVD),

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cancer, chronic respiratory disease, and diabetes, are increasing in an alarming rate.³ RF and RHD are contributors to one of the four, i.e. CVD. In the past few decades, incidence and prevalence of acute RF have decreased much, but chronic RHD continues to be rampant in this population.

2. Rationality of the review

Data related to RF and RHD in Bangladesh are often insufficient, suffer from statistical flaws and are not readily available. Many articles were published in local, non-indexed journals which are not available online and difficult to procure. Recognizing these limitations, the present review has been planned to compile the available data on this important public health issue. This review will hopefully stimulate future research and act as a valuable source of information.

3. Methods

Data have been collected from the articles available from MEDLINE and BanglaJOL supported by the International Network for the Availability of Scientific Publications (INASP) up to the year 2014. Besides this, local journals which are not available online but recognized by the Bangladesh Medical and Dental Council have also been considered.

4. Epidemiology of RF and RHD in Bangladesh

RHD ranks among the leading causes of non-communicable diseases in low-income and middle-income countries and accounts for up to 250,000 premature deaths every year worldwide.⁴ In a recent systematic review and meta-analysis including 37 populations in endemic regions around the world, the pooled prevalence of RHD among children and adolescents (≥ 5 years to < 18 years) detected by cardiac auscultation was 2.9 per 1000 people and by echocardiography it was 12.9 per 1000 people, with substantial heterogeneity between individual reports for both screening modalities.⁵ Historically, RF and RHD were generally believed to be diseases of temperate climates and rarities in tropical countries. In 1930, RF was reported to be non-existing in this part of the world.⁶ In the early 1950s, non-existence of RF in tropical climate was claimed by Paul White, who advised the rheumatic family to take permanent residence in the tropics to avoid RF.⁷ Boyd states 'in the tropics, where hemolytic streptococci are rarely found in the throat, scarlet fever is uncommon and RF is very uncommon'.⁸ In 1957, Ibrahim quoted that, his medical teachers Drs. D.N. De, J.C. Banerjee, and A.K.M. Abdul Wahed, Professors of Medicine of Calcutta and Dacca Medical Colleges, always state that 'RF is as common in Bengal as in other parts of the world, where its incidence is frequent'.⁹ In the course of 5 years from January 1949 to December 1953, out of 19,011 patients admitted in Medical Wards of Dacca Medical College, East Pakistan, acute RF and RHD constituted 606 cases (acute RF 85, RHD 521).⁹ The exact incidence and prevalence of RF and RHD in Bangladesh are not known. Only a limited number of small-scale hospital, school, and community surveys are

available. Another limitation is that acute RF, recurrence of RF, and chronic RHD have been described together arbitrarily, and their separate values are often obscure. In the 2nd half of the last century, RF and RHD constituted a significant proportion of admissions in general hospitals, and a lion's share of cardiovascular admissions.^{10–12} However, the situation gradually improved. During July 1995 to June 1997, out of 4410 cardiac patients admitted in 13 regional and tertiary care hospitals across the country, 13% were due to RF and RHD.¹³ Probably the community prevalence of RF and RHD was first reported in 1976, which was 7.5/1000 in general population, i.e. the second-most prevalent cardiac disease (hypertension 11.0/1000), and even more prevalent than IHD (3.3/1000).¹⁴ In 1984, almost similar prevalence was found in a rural population.¹⁵ Subsequent surveys involving rural,¹⁶ mixed,¹⁷ and urban¹⁸ population found lower prevalence of RF and RHD. High prevalence of RF (43.9/1000) and RHD (5.05/1000) was reported in a school survey involving 4349 children aged 4–17 years in Dhaka City in 1984–1985.¹⁹ Subsequent school surveys revealed lower prevalence.^{20–23} Most of these studies suffer from methodological flaws and lack uniformity in criteria used for diagnosis. Over the past 3 decades, like many other parts of the world, the incidence and prevalence of acute RF in Bangladesh decreased; however, RHD continues to be an important public health problem here. Current prevalence of RF and RHD is not exactly known, however, may be $< 1/1000$ in general population. Recently, conventional and portable echocardiography is being used increasingly in studies concerning RF and RHD, as a result, more and more subclinical cases of RHD are being diagnosed. So, the prevalence of RF and RHD estimated so far may not be accurate, and the true prevalence of RHD may be much higher in Bangladesh as well (Table 1).

Data on prevalence of streptococcal sore throat in Bangladesh are sparse. In a study²⁴ carried out in 1982–1984, out of 7542 throat swab specimens from sore throat patients, beta hemolytic streptococci (BHS) were found in 20.22%. Anti-streptolysin O (ASO) titer was determined in 5678 cases of this study, 17.11% showed raised titer, i.e. > 200 Todd units. Prevalence of BHS found in subsequent studies ranged from 11 to 33% in different populations^{25–30}; 6–21.5% of the BHS belonged to group A.^{26–29} Considering these figures, the prevalence of BHS in Bangladeshi children and young adults may be 20% on an average, of which 15% may be of group A. Highest incidence of streptococcal sore throat was found during August to December (Table 2).³¹

5. Emerging issues in epidemiology of RF and RHD

Traditionally, RHD was diagnosed by auscultation for a heart murmur with a stethoscope in those with a history of acute RF. Echocardiography, introduced later on, has proven to be more sensitive and specific than auscultation, and introduction of echocardiography in studies on RF and RHD leads to detection and inclusion of previously unrecognized cases of subclinical carditis, which exists at rates several times higher than that diagnosed by examination alone.^{32,33} RHD detected on echocardiography without an associated clinically pathological cardiac murmur is referred to as 'subclinical

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