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INVITED ARTICLE

Rheumatic heart disease in Egypt: Gloomy past and promising future

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Abstract Rheumatic fever (RF) and rheumatic heart disease (RHD) have decreased in prevalence in the advanced industrialized nation. In the developing world, RF and RHD although less prevalent than they were 30 to 50 years ago, are still a major health problem. Poor socio-economic standards and difficulty of reaching proper primary health care facilities are the main causes of the still relatively high prevalence. This article will discuss in brief the epidemiology of group A beta hemolytic streptococci (GAS) and RF/RHD as well as their global burden. The gloomy past of RF/RHD will hopefully give way to the promising future we all strive to achieve through better social standards, sanitation and hygiene, and availability of better health care for all.

1. Introduction and definition

Rheumatic fever (RF) is a non-suppurative sequel of Group A beta hemolytic streptococcal infection of the upper respiratory tract due to a delayed immune response. It affects mainly children and young adults in their most productive years.

Studies done with the WHO (World Health Organization) have clearly shown that a proper primary health care and secondary prevention program are both cost effective and inexpensive and hence reduce the burden of disease.[1–3]

Despite the documented decrease in the incidence of acute rheumatic fever and prevalence of rheumatic heart disease (RHD), it still is an important cause of cardiovascular disease worldwide. Heart valve surgery adds to the lifelong burden of disease.

2. Epidemiology of group A streptococci, rheumatic fever and rheumatic heart disease

2.1. Group-A streptococcal infections

There are several groups of beta hemolytic streptococci depending on their cell-wall polysaccharide antigens. Serological group-A beta hemolytic streptococci (GAS) can again be divided into more than 130 different M-types responsible for most human infections; mainly pharyngitis and impetigo. Pharyngitis caused by group-A streptococci is related to the pathogenesis of rheumatic fever and rheumatic heart disease

Abbreviations: CHF, congestive heart failure; DALY, disability adjusted life year; GAS, group A hemolytic streptococci; RF, rheumatic fever; RHD, rheumatic heart disease; WHO, World Health Organization

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Table 1 Examples of reported prevalence of rheumatic heart disease in school children.

WHO Region (country, city)	Year	Rate/1000 population
Africa		
Kenya (Nairobi)	1994	2.7
Zambia (Lusaka)	1986	12.5
Ethiopia (Addis Ababa)	1999	6.4
Guinea (Conakry)	1992	3.9
DR Congo (Kinshasa)	1998	14.3
Americas		
Cuba (Havana, Santiago, P. del Rio	1987	0.2–0.9
Bolivia (La Paz)	1986–1990	7.9
Eastern Mediterranean		
Morocco	1989	3.3–10.5
Egypt (Cairo)	1986–1990	5.1
Sudan (Khartoum)	1986–1990	10.2
Saudi Arabia	1990	2.8
Tunisia	1990	3–6
South East Asia		
Northern India	1992–1993	1.9–4.8
India	1984–1995	1–5.4
Nepal (Katmandu)	1997	1.2
Sri Lanka	1998	6
Western Pacific		
Cook Islands	1982	18.2
French Polynesia	1985	8
New Zealand (Hamilton)	1983	6.5 (Maoris) 0.9 (Non-M)
Samoa	1999	77.8
Australia (Northern Territory)	1989–1993	9.6

Multiple sources quoted from: WHO Expert Consultation on Rheumatic Fever and Rheumatic Heart Disease, Geneva 29/10–1/11 2001.

with the highest incidence in the 5-15 year old children.[4–7] 15–20% of pharyngitis in children is caused by GAS and the remaining 80% are viral.[1,5–7]

The incidence of GAS pharyngeal infections varies between countries and also within the same country depending on several factors including season (usually winter), age group, socioeconomic conditions, environmental conditions and level of primary health care.[1,4,5,8–10] GAS carrier rates occur from 10% to 50% of asymptomatic school children.[1,8] Only in the true infection does the patient show a rising antibody titer. Probably those with true infections are the ones who develop RF and can also spread the pharyngeal infections.

GAS pharyngeal infection can be easily transmitted and spread rapidly in families and among school children; pointing to the deleterious effects of overcrowded living conditions and school classrooms as an important cause of the spread of GAS pharyngitis.

3. Rheumatic fever and rheumatic heart disease

Data on the incidence of RF are difficult to obtain. In some countries, mostly the more developed nations, the incidence from RF registers of school children has shown a wide variation between countries. The developed countries show an incidence of below 1 in 100,000.[12] Others from developing countries vary from 1 per 100,000 in Costa Rica,[11] 100 per 100,000 in the Sudan.[12]

The prevalence of RHD is better studied by different countries mainly of school-age children. It varied widely between countries (Table 1) and even between different ethnic groups in the same country during the last 10 years of the last century. It is noticed that the prevalence varies from 0.2 per 1000 school children in Havana, Cuba to 77.8 per 1000 in Samoa.

Several developing countries have implemented prevention programs and hence a marked decrease occurred in the incidence of RF and RHD. Examples are Cuba, Costa Rica and Egypt.[11–13]

Multiple sources quoted from: WHO Expert Consultation on Rheumatic Fever and Rheumatic Heart Disease, Geneva 29/10–1/11 2001.[18]

4. The global burden of RHD

In developing countries, RF and RHD have been estimated to affect nearly 20 million people.[14] There are 470,000 new cases of RF and 233,000 deaths due to RF and RHD worldwide annually.[15] Out of the 20 million, about 3–4 million have congestive heart failure (CHF) that require repeated hospital admissions with a large number of these requiring heart valve surgery within 5–10 years.[12,16,17] The mortality rate varies from 1.8/100,000 in the WHO region of the Americas to 7.6/100,000 in the WHO region of South-East Asia.

Another way to estimate the effect of the disease is by using the disability adjusted life years lost (DALYs). This is defined as the sum of years of life lost owing to premature death, plus the years lived with disability adjusted for the severity of the disability[17] (Table 2[18]).