

RHEUMATIC HEART DISEASE (RHD)

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If you quote
Coronary Heart Disease (CHD)

as

“disease of king & king of diseases”

what will you call

“a disease of the poorest”?

Which is the most common
cardiovascular disease affecting
5-30 years age group?

Introduction

- Rheumatic fever (RF) and rheumatic heart disease (RHD) cannot be separated from an epidemiological point of view.

Introduction

- Rheumatic fever is a febrile disease affecting connective tissue particularly in the heart and joints initiated by infection of throat by group A beta haemolytic streptococci.
- Although RF is not a communicable disease, it results from a communicable disease (streptococcal pharyngitis).

Introduction

- Rheumatic fever often leads to RHD which is a crippling disease.
- The consequences of RHD include:
 - continuing damage to the heart;
 - increasing disabilities;
 - repeated hospitalization, and
 - premature death usually by the age of 35 years or even earlier. RHD is one of the most readily preventable chronic diseases.

Problem Statement- World

- Rheumatic Fever & Heart Disease - prevalent all over the world especially in developing countries.
- RF is the most common cause of heart disease in the 5-30 year age-group throughout the world.
- It was estimated that in 1994, about 12 million individuals suffered from RF and RHD worldwide.
- However the last two decades have seen its rapid decline in developed countries
- Major cause of mitral insufficiency and stenosis

Problem Statement- India

- RHD is prevalent in the range of 5-7 per thousand in 5-15 years age group and around 1 millions RHD cases.
- RHD constitutes 20-30% of hospital admissions due to CVD.
- Streptococcal infections are very common especially in children living in underprivileged conditions

Epidemiological Factors

Agent factors:

(a) AGENT:

- The onset of RF is usually preceded by a **streptococcal sore throat**.
- Of the streptococci, it is the **group A streptococcus** that has been incriminated as the causative agent.

Epidemiological Factors

Agent factors (Contd.):

- Not all strains of group A streptococci lead to RF;
- It is believed that there might be some strains with “rheumatogenic potential”.
- The serotype - M type 5 has been found frequently associated with RF.

Epidemiological Factors

Agent factors (Contd.):

- Recently the virus (coxsackie B-4) has been suggested as a causative factor and streptococcus acting as a conditioning agent.
- There are many gaps in our knowledge about the causative agent and underlying pathogenic mechanism.

Epidemiological Factors

Agent factors (Contd.)

(b) CARRIERS:

- Carriers of group A streptococcus are frequent, e.g., convalescent, transient and chronic carriers.
- In view of the high carrier rate, their eradication is not even theoretically possible.

Epidemiological Factors

HOST AND ENVIRONMENTAL FACTORS:

(a) AGE:

- 5-15 years.
- The initial attack of RF occurs at a young age, progresses to valvular lesions faster and is associated with pulmonary arterial hypertension.
- **“Juvenile mitral stenosis”**

Epidemiological Factors

HOST AND ENVIRONMENTAL FACTORS:

(b) SEX:

- Both sexes equally susceptible

Epidemiological Factors

HOST AND ENVIRONMENTAL FACTORS:

(c) SOCIO-ECONOMIC STATUS:

- RF is a social disease linked to poverty, overcrowding, poor housing conditions, inadequate health services, inadequate expertise of health - care providers and a low level of awareness of the disease in the community.
- It declines sharply when the standard of living is improved.

Epidemiological Factors

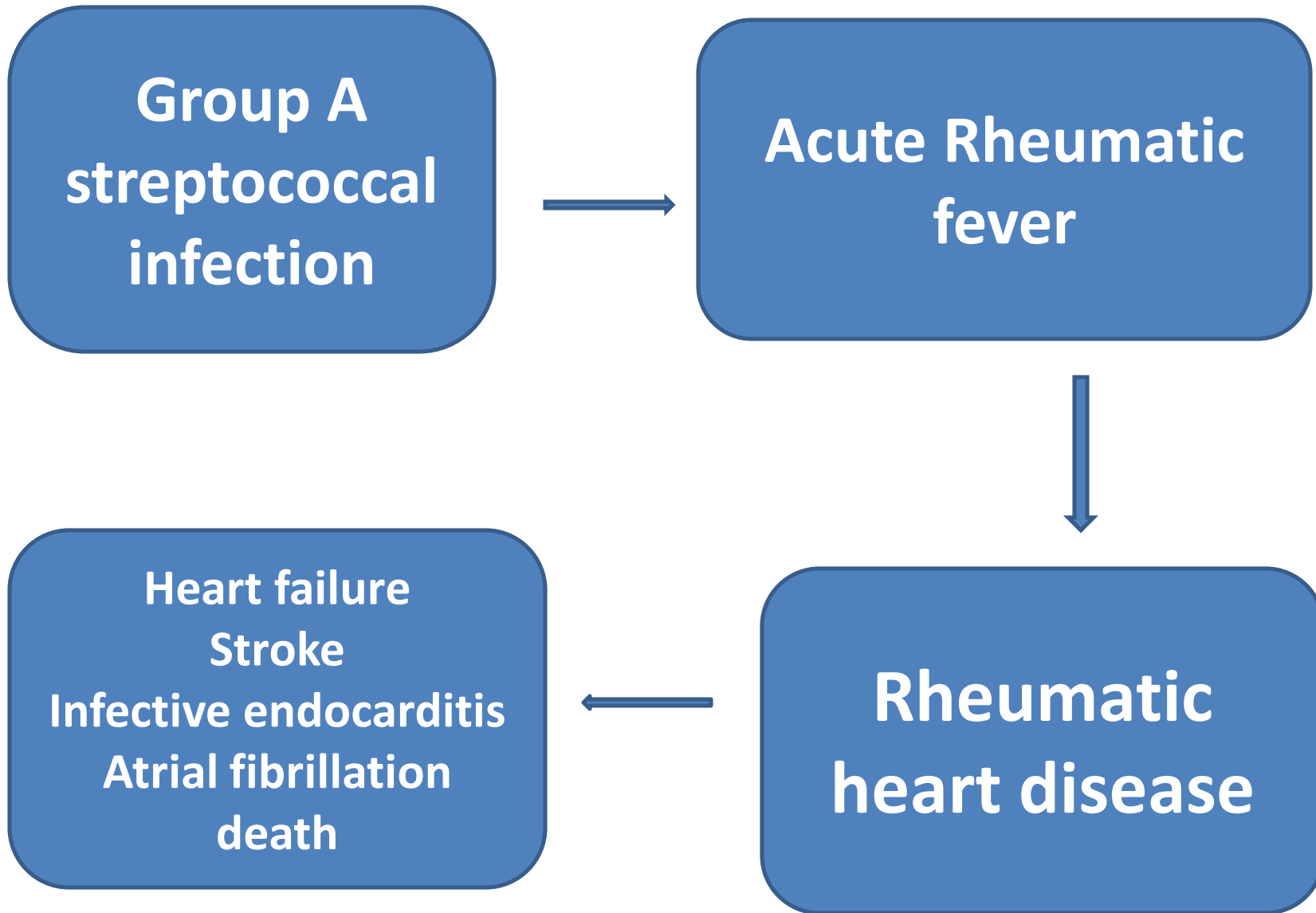
HOST AND ENVIRONMENTAL FACTORS (Contd.)

(d) HIGH-RISK GROUPS :

- The school-age children between 5 and 15 years;
- slum dwellers;
- those living in a closed community.

Pathogenicity

- Grp A beta hemolytic Strep URTI
- Repeated attacks
- Increased susceptibility leads to ARF
- Multiple ARF attacks leads to RHD
- Underlying pathology –
 - Autoimmune mechanism
 - Type II Hypersensitivity reaction
- In Chronic RHD, valvular changes
- [Aschoff bodies](#), Aschoff giant cells



Natural history of rheumatic fever and rheumatic heart disease

Clinical features

(a) FEVER:

- Fever is present at the onset of acute illness and may be accompanied by profuse sweating.
- It may last for about 12 weeks or longer and has a tendency to recur.

Clinical features (Contd.)

(b) POLYARTHRITIS:

- Occurs in 90 % of cases.
- Large joints like ankles, knees, elbows and wrists are involved;
- Uncommonly smaller joints of hands and feet may be involved.
- The pain and swelling come on quickly and also subside spontaneously within 5-7 days. There is no residual damage to the joint.

Clinical features (Contd.)

(c) CARDITIS:

- Occurs in 60-70 % of cases.
- Starts early in the course of RF.
- All layers of the heart- pericardium, myocardium and the heart valves involved.
- The involvement of heart is manifested by tachycardia, cardiac murmurs, cardiac enlargement, pericarditis and heart failure.
- The most common ECG finding is the first degree AV block.

Clinical features (Contd.)

(d) NODULES:

- Nodules below the skin tend to appear 4 weeks after the onset of RF.
- They are small, painless and non-tender.
- They last for a variable period of time and then disappear leaving no residual damage.

Clinical features (Contd.)

(e) BRAIN INVOLVEMENT:

- This manifests as abnormal jerky purposeless movements of the arms, legs and the body.
- It gradually disappears leaving no residual damage.

Clinical features (Contd.)

(f) SKIN:

- Various types of skin rash are known to occur.
- It is thus obvious that except carditis all other manifestations of RF do not cause permanent damage.

Strep. Follicular Exudate - tonsil



Streptococcal “Raspberry Tongue”



Streptococcal Enanthem



Diagnosis

Based on major & minor
manifestations as
suggested by revised Jones
criteria (2002-2003)

Diagnosis – Major Manifestations

1. *Carditis*
2. Polyarthritits
3. Chorea
4. Erythema Marginatum
5. Subcutaneous nodules

Diagnosis – Minor Criteria

- Clinical – Fever , Polyarthralgia
- Laboratory –
 - Increased ESR
 - Increased WBC &
 - Increased C-Reactive proteins

Diagnosis –Supporting evidences of h/o strep. Inf. In last 45 days

- ECG – Prolonged PR Interval
- Elevated or rising Antistreptolysin – O or
- Positive throat culture or
- Rapid Antigen test for Grp A Strep. or
- Recent scarlet fever.

Diagnosis

Jones criteria facilitate the diagnosis of:

1. a primary episode of RF
2. Recurrent attacks of RF in patients without RHD
3. Recurrent attacks of RF in patients with RHD
4. Rheumatic chorea
5. Insidious onset rheumatic carditis
6. Chronic RHD.

Diagnostic Categories

Diagnostic Categories	Criteria
Primary episode of RF Recurrent attack of RF WITHOUT established RHD	(2 major) or (1 major+2 minor) + (h/o strep. infection)
Recurrent attack of RF WITH established RHD	2 minor + h/o strep. Infection
Rheumatic Chorea, Insidious onset of Rheumatic carditis	Other major signs or h/o strep. Infection not required
Chronic valve lesion of RHD	Do not require any other criteria as having RHD

- Primordial prevention
- Improving living conditions, and
- Breaking the poverty-disease-poverty cycle.
- Improvements in socioeconomic conditions (particularly better housing) will in the long term reduce the incidence of RF.

Prevention- Primary

- Aim is to prevent the first attack of RF, by identifying all patients with streptococcal throat infection and treating them with penicillin.
- While this approach is theoretically simple, in practice, it is difficult to achieve and may not be feasible in many developing countries.

Primary Prevention (Contd.)

- In order to prevent a single case of RHD, several thousand cases of streptococcal throat infection must be identified and treated.
- Many infections are inapparent or if apparent are not brought to the attention of the health services; even if they are reported, quick and reliable laboratory services are needed to confirm the diagnosis.

Primary Prevention (Contd.)

- A viable approach is to concentrate on “high risk” groups such as school-age children.
- They should be kept under surveillance for streptococcal pharyngitis.

Primary Prevention (Contd.)

- Ideally a sore throat should be swabbed and cultured. If streptococci are present, the child should be put on penicillin.
- Since facilities for throat swab culture are not easily available, it is justified to treat a sore throat with penicillin even without having the culture.

Primary Prevention (Contd.)

- **Benzathine Benzyl penicillin** - Single IM injection (12 lakh units - adults, 6 lakh units - children)

Or

- **Oral Penicillin** for 10 days
- *Penicillin – Drug of choice – Safe, effective, inexpensive*
- If allergy for penicillin then give – Erythromycin

Secondary Prevention

- More practicable approach, especially in developing countries.
- It consists in identifying those who have had RF and giving them one intramuscular injection of benzathine benzyl penicillin (1.2 million units in adults and 600,000 units in children) at intervals of 3 weeks.
- This must be continued for at least 5 years or until the child reaches 18 years whichever is later.

Secondary Prevention (Contd.)

- For patients with carditis (mild mitral regurgitation or healed carditis) the treatment should continue for 10 years after the last attack, or at least until 25 years of age, whichever is longer.
- More severe valvular disease or post-valve surgery cases need lifelong treatment.
- This prevents streptococcal sore throat and therefore recurrence of RF and RHD.

Secondary Prevention (Contd.)

- Mx with Penicillin
 - To prevent colonization
 - To prevent recurrences of Grp A Strep URTI
 - To prevent subsequent ARF
- Cost effective – reduces morbidity & mortality
- In 70% pts. With Rheumatic carditis, heart murmurs disappear with secondary prophylaxis.

Some recent initiatives in India

- Jai Vigyan Mission Mode Project conducted by ICMR 2000 to 2010. report published in 2015
- NPCDCS and RBSK
- National program for control of cardiovascular diseases, diabetes, cancer and stroke in Selected district
- World heart federation has set a goal **25 by 25 in less than 25**

Thank You...