Cardiovascular Diseases: Stroke, Rheumatic Heart Disease

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Stroke

• Rapidly developed clinical signs of focal (or global) disturbance of cerebral function; lasting more than 24 hours or leading to death, with **no apparent** causes other than vascular origin.

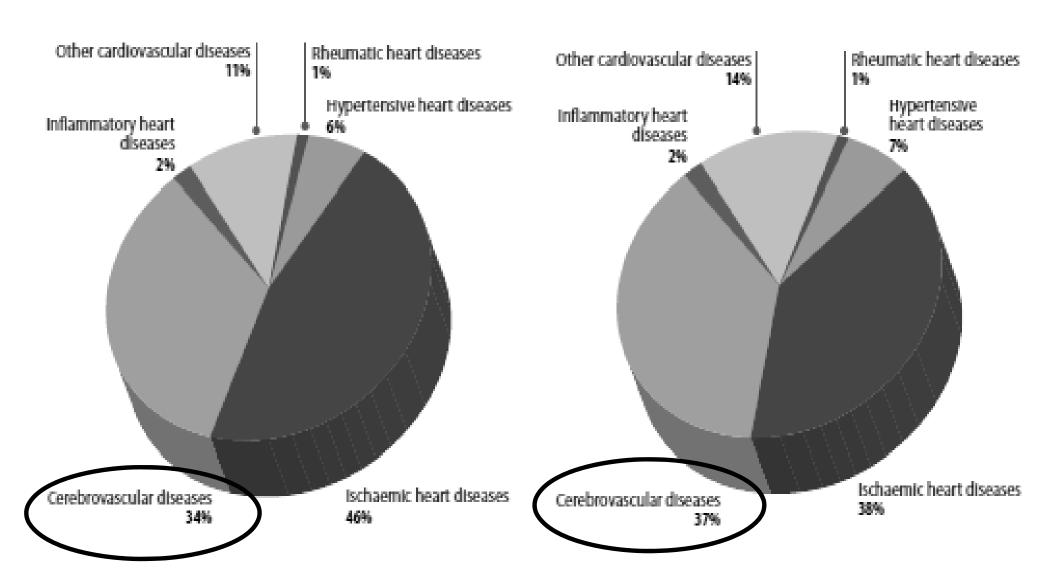
• Ischemic strokes

- Atherosclerotic stenosis or occlusion
- Cardio-embolism
- Small vessels disease
- Misc: CNS infections, hypercoagulable states etc.

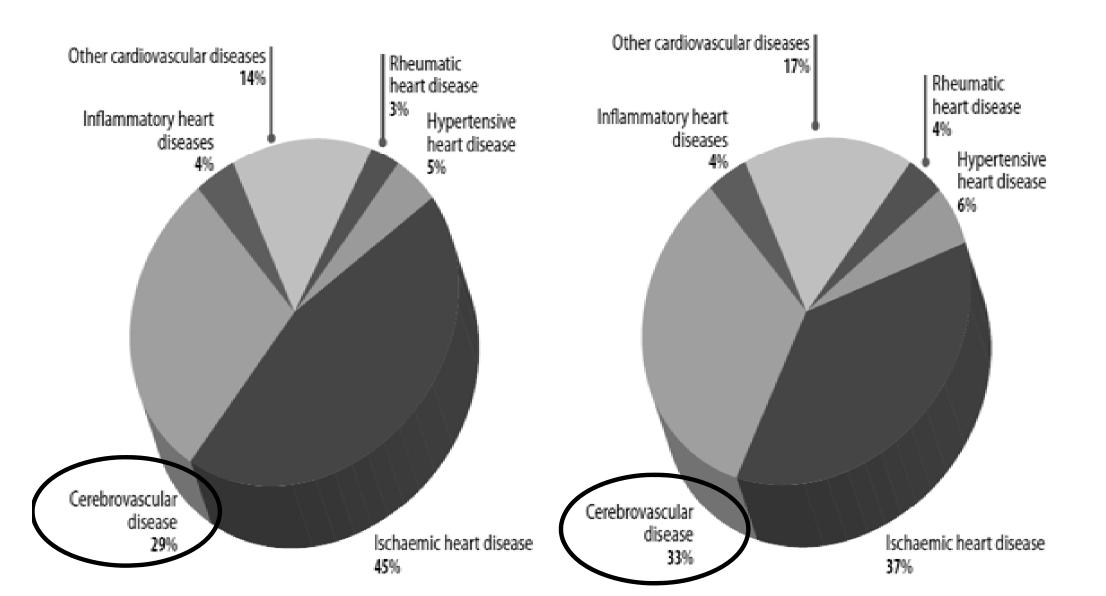
Hemorrhagic strokes

- Subarachnoid hemorrhage
- Intracerebral hemorrhage

Distribution of CVD deaths



Distribution of CVD Burden (DALYS)



Global distribution of Cerebrovascular Disease mortality rates (age standardized, per 100 000) in Males



Global distribution of Cerebrovascular Disease mortality rates (age standardized, per 100 000) in Females



Risk Factors

- Non-modifiable risk factors
- Modifiable risk factors

Non-modifiable Risk Factors

- Age
- Gender
- Genetic factors
- Geography & Ethnicity

Age	RR every decade <i>after 55yrs</i> : 1.66 – 1.93
Gender	M:F = 1.15-1.3:1.0
Genetic factors	5x Prevalence in Monozygotic Twins
Geography	Eastern European countries; US (<i>Ischemic</i>) while Japan & China (<i>Hemorrhagic</i>)
Ethnicity	African American > White

Modifiable Risk Factors

- Hypertension
- Diabetes
- Blood lipids
- Cardiovascular diseases
- Smoking
- Alcohol
- Physical activity

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Hypertension	RR:1.5 - 3
	<i>RR</i> with every> 10 mmHg in <i>SBP</i> : 1.7 – 1.9
Diabetes	RR: 1.4 – 2; Thromboembolic stroke
Blood Lipids	Complex- Inverse relationship between cholesterol & I/C hemorrhage; Modest association between raised serum cholesterol and thrombo-embolic stroke
C V disease	RR: 1.7; Ischemic stroke.
Smoking	RR: 1.24 (Cerebral hemorrhage) - 2.53 (Ischemic stroke) - 4.85 (Sub arachnoid hemorrhage)
Alcohol	RR: 2-3; SAH
f Physical activity	

Prevention & Control of Stroke

Community Level Health Action :-

- a. Control of hypertension
 - TIA earliest detection & prompt Tt
- b. Control of diabetes mellitus
- c. No smoking
- d. Other risk factors-
 - surveys to know magnitude of the problem
 - training of health functionaries & public.

Rheumatic Fever Rheumatic Heart Disease

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Rheumatic Fever/Rheumatic Heart Disease

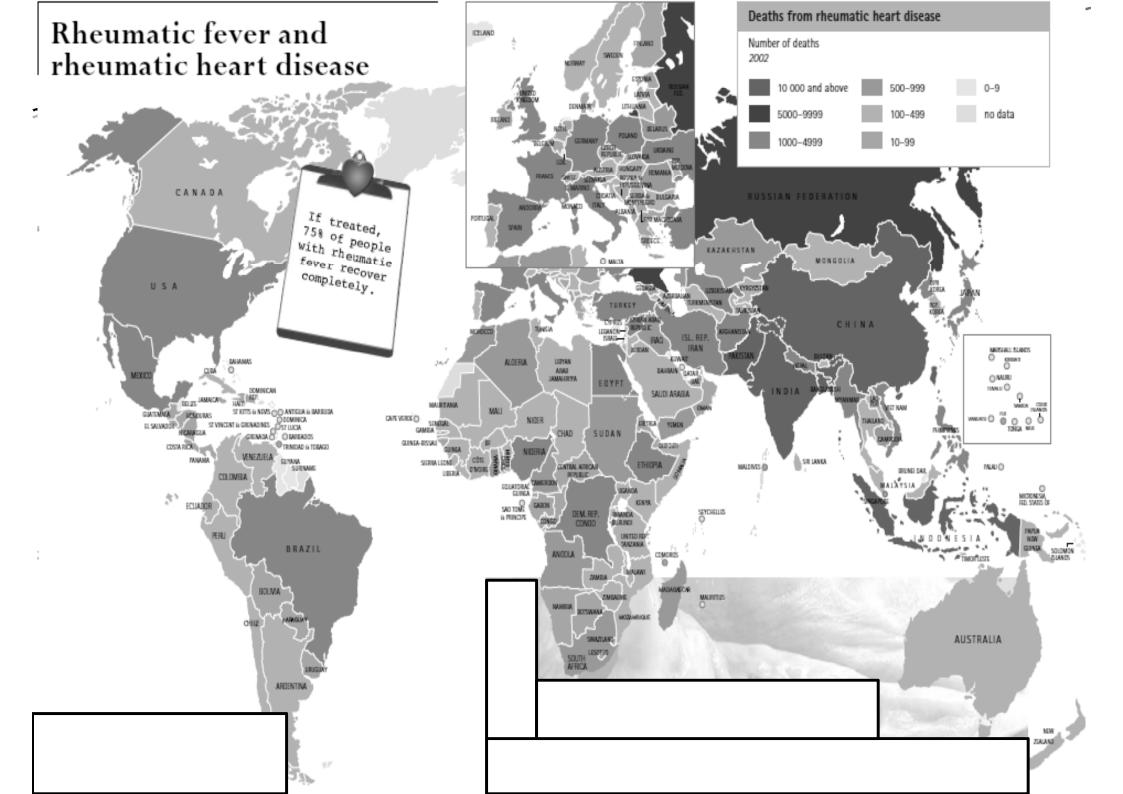
- Rheumatic fever
 - a febrile disease affecting connective tissues particularly in the heart and joints
 - initiated by infection of the throat by *group A beta* haemolytic streptococci.
- Rheumatic fever often leads to Rheumatic Heart Disease (RHD).

• RF and RHD remain significant causes of cardiovascular diseases in the world today.

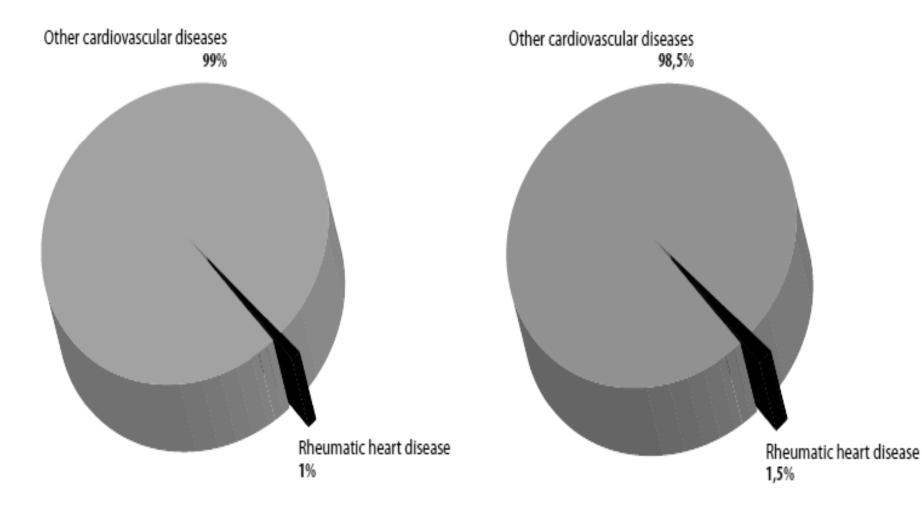
• **Most devastating effects** - on children and young adults in their **most productive years**

Magnitude of the Problem

- RF-the most common cause of heart disease in the **o5-30** *year age group* throughout the world.
- Based on hospital data, RHD accounts *for* 12-65 *percent of hospital admissions* related to cardiovascular disease.
- RF and RHD continue to exert a significant burden on the health of low socioeconomic populations in LMICs despite the near disappearance of the disease in the developed world over the past century.

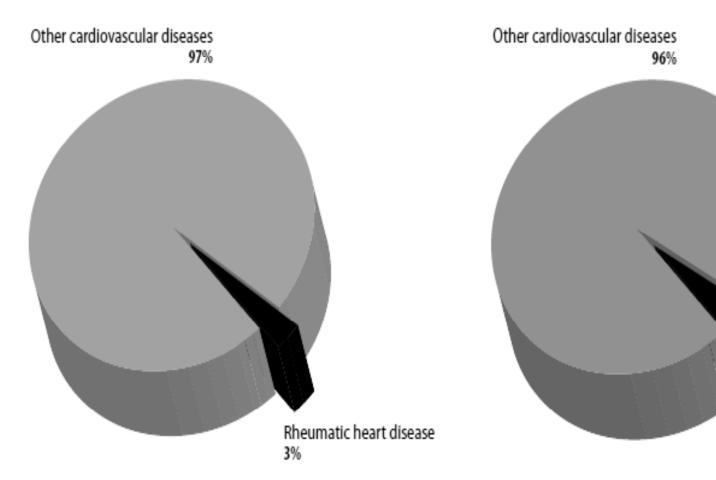


Proportion of global CVD deaths due to RHD, 2008



Proportion of global CVD burden (DALYs) due to RHD, 2008

Rheumatic heart disease



Epidemiological Factors

- Agent Factors:
- ➤ Rheumatic Fever (RF) and Rheumatic Heart Disease (RHD) are nonsuppurative complications of Group A streptococcal pharyngitis due to a delayed immune response.
- ➤ All strains of Group A streptococci are not implicated in causation of Rheumatic Fever but the serotype which has *attracted the most attention in M type 5*.

• Host Factors:

- (a) *Age* Rheumatic Fever is commonly *a disease of childhood and adolescent age group (05-15 years).*
- (b) *Sex*-Affects both sexes equally.

• Environmental Factors :

- Low socio-economic status
- Overcrowding and
- Poor ventilation/housing conditions.

Environmental and Health-system determinants

Determinants	Effects	Impact on RF and RHD burden
Socioeconomic and Environmental factors: -poverty, -undernutrition, -overcrowding, -poor housing.	-Rapid spread of group A streptococcal strains. -Difficulties in accessing health care.	-Higher <i>incidence</i> of acute streptococcal-pharyngitis and suppurative complicationsHigher <i>incidence</i> of acute RFHigher <i>rates</i> of recurrent attacks.

Determinants	Effects	Impact on RF and RHD
		burden
Health-	-Inadequate	-Higher incidence of acute
system	diagnosis and	RF and its recurrence.
related	treatment of	-Patients unaware of the
factors:	streptococcal	first RF episode.
-shortage of	pharyngitis.	-More severe evolution of
resources for	-Misdiagnosis	disease.
health care;	or late dx of	-Untimely initiation or lack
-inadequate	acute RF.	of secondary prophylaxis.
<i>expertise</i> of	-Inadequate	-Higher rates of recurrent
health-care	secondary	attacks with more frequent
providers.	prophylaxis	and severe heart valve
-low-level	and/or non-	involvement, and <i>higher</i>
awareness of	compliance	rates of repeated hospital
the disease in	with	<i>admissions</i> and expensive
community.	secondary	surgical interventions.
-	prophylaxis.	

Clinical Features

Major manifestation (05)	 Carditis Polyarthritis Chorea Erythema marginatum Subcutaneous nodules
<i>Minor</i> manifestation (04)	 Fever, polyarthralgia Lab: elevated acute phase reactants (ESR, leukocyte count).
Supporting evidence of a preceding streptococcal Infection (06)	 Prolonged <i>P-R interval</i> Elevated or rising antistreptolysin-O or Other streptococcal Ab or A + throat culture or <i>Rapid antigen test</i> for group A streptococci or Recent scarlet fever

Jones Criteria

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Primary episode of RF	Two major or One major and two minor manifestations plus evidence of a preceding group A streptococcal infection	
Recurrent attack of RF in a patient without established rheumatic heart disease	Two major or One major and two minor manifestations plus. evidence of a preceding group A streptococcal infection.	
Recurrent attack of RF in a patient with established rheumatic heart disease	Two minor manifestations plus evidence of a preceding group A Streptococcal infection	

Prevention of Rheumatic Fever and Rheumatic Heart Disease

- Primary prevention
- Secondary prevention

Primary Prevention

• The adequate antihintic therapy* of orong A

infections to prevent an initial attack of acute kr.

- Approach is theoretically simple, but it may not be practically feasible.
 - *In order to prevent a single case of RHD*, several thousand cases of streptococcal throat infection will need to be identified and treated.

• A more practical and viable approach is *to concentrate on "high risk" group* such as school children and to treat a sore throat with *penicillin empirically* even without the throat swab culture.

Secondary prevention

- The continuous administration of specific antibiotics to patients with a previous attack of RF, or a well-documented Rheumatic Heart Disease (RHD).
- *The purpose* is to prevent colonization or infection of the Upper Respiratory Tract (URT) with group A betahemolytic streptococci and the development of recurrent attacks of RF.
- **Secondary prophylaxis** is mandatory for all patients, who have had an attack of RF, whether or not they have **residual rheumatic valvular heart disease.**

COMPARISON ON STREPTOCOCCAL AND VIRAL SORE THROAT

Feature	Streptococcal	Viral
Onset	Abrupt	Gradual
Throat	Painful	Uncomfortable
Cervical nodes	Enlarged, tender	Not enlarged
Eyes and nose	Not affected	Watery eyes, runny nose
Throat/tonsils	Red, swollen, exudate	Red, vesicles, ulcers

MTDs: 21st: 158

Antibiotic	Mode of administration	Dose	
Benzathine benzylpenicillin	Single intramuscular injection every 3-4 weeks	For adults and children > 30 kg in weight: 1200 000 units For children < 30 kg in wt: 600000 units	
Penicillin V,	Oral	250 mg twice daily	
Sulfonamide (e.g. sulfadiazine sulfadoxine, sulfisoxazole)	Oral	For adults and children > 30 kg in wt: 1 gram daily For children < 30 kg in wt : 500 mg daily	
Erythromycin	Oral	250 mg twice daily	

Suggested duration of secondary prople	hyl	axis*
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Category of patient	Duration of prophylaxis
Patient without proven carditis	For 5 yrs after the last attack, or until 18 yrs of age (which ever is longer)
Patient with carditis (Mild mitral regurgitation or healed carditis)	For 10 yrs after the last attack, or at least until 25 yrs of age (whichever is longer)
More severe valvular diseases	Life long
After valve surgery	Life long

These are *only recommendations* and must be modified by

Other measures for the prevention/control of RF/RHD

• Improving living conditions,

• Breaking the poverty-disease-poverty cycle.

• Improvements in socio-economic conditions

(particularly better housing).

- Not always feasible to implement broad-based primary prevention programs in most developing countries.
- A provision for the prompt diagnosis and effective therapy of streptococcal pharyngitis should be integrated into the existing healthcare facilities

THANKS