

Rheumatic Fever

The questions signed by * are hard: read their explanation. ● Past Years ● TBL ● Others

This file belongs to the PULSE Cardiology question book: the explanations of the multiple choice answers and the model answers of the essay questions, in the words of the handout.

Answer Key | Multiple Choice Questions

Question no.	1	2	3	4	5	6	7	8	9	10	11	12
Answer	d	c	a	c	a	a	d	d	a	a	a	c

Question no.	13	14	15	16	17	18	19	20	21
Answer	a	a	c	b	c	b	c	b	c

► Second | Questions with a Note

Question no.	1	2
Answer	b	a

► Why this answer?

- What is the recommended duration for secondary prophylaxis after rheumatic fever?
(d) At least until 40 years of age / for life in patients...
 Secondary prevention lasts till age 40 years or lifelong in patients with severe valvular disease or after valvular replacement. Without carditis it is till age 21 (at least 5 years) and with mild regurgitant lesion till age 25 (at least 10 years), so a, b and c mix up the groups.
- What is the most commonly affected valve in rheumatic heart disease?
(c) Mitral valve
 Mitral valve is commonly involved, followed by aortic valve then tricuspid valve.
- Which of the following is a minor criterion of acute rheumatic fever?
(a) Fever
 Fever is a minor criterion. Erythema marginatum and carditis are major criteria, and a raised ASO titre is evidence of recent streptococcal infection.
- Which of the following is false regarding rheumatic chorea in children?
(c) Associated with hypertonia and hyperreflexia
 Sydenham's chorea gives hypotonia and hyporeflexia, not hypertonia and hyperreflexia. It is more common in girls over 8 years, gives emotional instability and interrupted speech, and could occur alone weeks or months after the streptococcal infection.
- Major manifestations of rheumatic fever are the following EXCEPT:
(a) Fever
 Fever is a minor criterion. Arthritis, carditis and Sydenham's chorea are major criteria.

- 6** Regarding acute rheumatic fever, which of the following is not true?
(a) Raised antistreptolysin O titre is a minor criterion
 A raised ASO titre is evidence of recent streptococcal infection, not a minor criterion. Arthralgia and raised ESR are minor criteria, and the arthritis affects big joints.
- 7** Which of the following is not a risk factor for the development of rheumatic fever?
(d) Streptococcal skin infection
 Rheumatic fever follows streptococcal pharyngitis with group A beta hemolytic streptococci, not skin infection. Good nutrition, proper hygiene, good housing and adequate ventilation are the primordial prevention of recurrent pharyngitis, so their absence is a risk.
- 8** Which of the following is true regarding secondary prevention of rheumatic fever?
(d) It aims to prevent colonization of the upper respiratory...
 Secondary prevention is of recurrent attacks, by monthly benzathine penicillin G or daily erythromycin. Preventing the first attack is primary prevention, the 10 days course belongs to the acute phase, and patients with carditis need the longest prophylaxis.
- 9** Regarding acute rheumatic fever, which of the following is not true?
(a) Cardiomegaly is a minor criterion
 Cardiomegaly is not a minor criterion; the minor criteria are fever, arthralgia, raised CRP, ESR and/or total leucocytic count, and prolonged PR interval. Arthralgia and raised ESR are minor criteria, and the arthritis affects big joints.
- 10** Regarding acute rheumatic fever, which of the following is not true?
(a) Hepatomegaly is a minor criterion
 Hepatomegaly is not a minor criterion; the minor criteria are fever, arthralgia, raised CRP, ESR and/or total leucocytic count, and prolonged PR interval. Arthralgia and raised ESR are minor criteria, and the arthritis affects big joints.
- 11** The minor Jones criterion for the diagnosis of acute rheumatic fever in the ECG is:
(a) Prolonged P-R interval
 Prolonged PR interval in ECG is the ECG minor criterion.
- 12** Primary prevention of rheumatic fever (RF) is defined as adequate antibiotic therapy of:
(c) Group A streptococcal URT infection
 Primary prevention is good treatment of acute pharyngitis: complete course of antibiotic in treatment of any acute streptococcal pharyngitis. The organism is group A beta hemolytic streptococci.
- 13** The minor criterion of acute rheumatic fever in the ECG is:
(a) Prolonged PR interval
 The ECG minor criterion is prolonged PR interval. 'Heart block' is wider, as it includes first degree, second degree and complete heart block, so (a) is the exact answer.
- 14** Which of the following is a primary prevention of rheumatic fever in individuals with streptococcal...
(a) Proper treatment with antibiotics
 Primary prevention is complete course of antibiotic in treatment of any acute streptococcal pharyngitis. Hygiene belongs to primordial prevention of recurrent pharyngitis.
- 15** Which of the following is a major criterion of acute rheumatic fever?
(c) Erythema marginatum
 Erythema marginatum is a major criterion. Fever and prolonged PR interval are minor criteria, and a raised ASO titre is evidence of recent streptococcal infection.
- 16** Regarding acute rheumatic fever, which of the following is true?
(b) PR interval is prolonged
 Prolonged PR interval in ECG is a minor criterion. Cardiomegaly is not a criterion, the arthritis affects big joints such as knee, wrist and elbow, and ESR is increased.
- 17** A 9-year-old boy is newly diagnosed with acute rheumatic fever. Which of the following is a major criterion?
(c) Erythema marginatum
 Erythema marginatum is a major criterion. Fever, arthralgia and prolonged PR interval are minor criteria.

- 18** A 7-year-old boy has newly diagnosed acute rheumatic fever. Which of the following is NOT true?
(b) 1st hour ESR 10 mm
 ESR is increased in acute rheumatic fever (minor criterion), so a first-hour ESR of 10 mm does not fit. Fleeting (migrating) polyarthritis and fever are typical, and endocarditis gives an audible murmur of the valve lesion.
- 19** In the diagnosis of rheumatic fever, which of the following is considered one of the major criteria?
(c) Polyarthritis
 Polyarthritis is a major criterion. The rash of rheumatic fever is erythema marginatum, the organism is group A beta hemolytic streptococci, and the ASO titer must be increased.
- 20** All of the following are minor criteria in the Modified Jones criteria for the diagnosis of rheumatic fever...
(b) Subcutaneous nodules
 Subcutaneous nodules are a major criterion. Fever, arthralgia and raised ESR/CRP are minor criteria.
- 21** Earliest valvular lesion in acute rheumatic carditis is:
(c) MI
 Mitral valve is commonly involved, and early affection of the valve could lead to regurgitation. Stenosis comes long term from destruction, fibrosis and adhesion of the valve.

► Second | Questions with a Note: why this answer?

- 1** * In adults, rheumatic fever mostly bites:
(b) The joints
 Arthritis is the commonest major criterion (75%), more than carditis (50%). The answer is inferred from these two figures, as the handout has no statement about adults.
- 2** A 9-year-old boy is newly diagnosed with acute rheumatic fever. Which of the following is a major criterion?
(a) Polyarthralgia
 Fever is a minor criterion, a raised ASO titre is evidence of streptococcal infection, and the PR interval is prolonged, not short. Polyarthralgia is accepted as a major criterion only in high-risk populations; the handout lists arthralgia as a minor criterion.

Model Answers | Essay Questions

- 1** Mention the treatment of acute rheumatic fever in children.

Treatment of acute phase

- * Supportive measures:
 - Bed rest in patients with carditis and arthritis till control of HF and normalization of ESR.
 - Low salt diet in heart failure.
- * Eradicate streptococcal infection with one of the following options:
 - Single dose of IM benzathine penicillin G.
 - 10 days course of oral penicillin V or amoxycillin.
 - In penicillin allergic patients: 10 days course of erythromycin, azithromycin, or clindamycin.

Anti-inflammatory drugs

Indication	Drug	Regimen
Arthritis	Salicylates	50-70 mg/kg/day (maximum 6 gram/day) for 5 days; then 50 mg/kg/day for 3 wks; then 25 mg/kg/day for 2-4 wks
Carditis	Corticosteroids: prednisone	2 mg/kg/day (max 60 mg) for 2-3 weeks; then 1 mg/kg/day for 2-3 weeks; then gradual tapering 5 mg/day every 2-3 days with introduction of 50 mg aspirin/day for 6 weeks

Other lines of treatment

- * Rheumatic chorea: haloperidol.
- * Heart failure: see heart failure.
- * Treatment of complications could include surgical replacement of diseased valve.

Secondary prevention of recurrent attacks

- * Monthly benzathine penicillin G or daily erythromycin in penicillin allergic patient.

Duration of secondary prevention

Duration	Patient
Till age 21 years (at least 5 years)	Patients without carditis
Till age 25 years (at least 10 years)	Patients with mild regurgitant lesion
Till age 40 years or lifelong	Patients with severe valvular disease or patients underwent valvular replacement

Prophylaxis against infective endocarditis

See infective endocarditis.

2 Discuss 4 major criteria of acute rheumatic fever.

A. Arthritis (75%)

- * Usually polyarthritis (≥ 4 joints).
- * Affecting big joints (e.g., knee, wrist, elbow...).
- * Fleeting: migrating from one joint to the other.
- * The affected joint shows: redness, hotness, swelling, limitation of movement $\pm$ effusion.
- * Good response to salicylates.
- * Spontaneous remission without deformity.

B. Clinical or subclinical carditis (50%)

- * Endocarditis:
 - Its presence is a must to diagnose rheumatic carditis.
 - Mitral valve is commonly involved followed by aortic valve then tricuspid valve.
 - Poly-valvular affection is the rule.
 - Early affection of the valve could lead to regurgitation.
 - Destruction, fibrosis, and adhesion of the valve will lead to long term stenosis, regurgitation, or combined stenosis and regurgitation.
 - Subclinical endocarditis is major criteria.

Type	Symptom	Sign	Investigation
Endocarditis	Asymptomatic or dyspnea	Audible murmur of valve lesion	Echocardiography will pick up valvular lesions (subclinical endocarditis is defined when detected in echocardiography despite being asymptomatic with no audible murmur)
Dry pericarditis	Stitching chest pain	Pericardial rub on auscultation	ECG: diffuse ST elevation in all leads with PR depression in V5 and V6
Pericardial effusion	Dull aching pain and dyspnea	Distant heart sounds on auscultation	Echocardiography will pick up pericardial effusion
Myocarditis	Dyspnea and palpitations	Gallop rhythm & muffled heart sounds	Echocardiography will pick up systolic dysfunction associated with myocarditis

C. Sydenham's chorea

- * More common in girls > 8 years due to affection of the basal ganglia.
- * Could occur alone (diagnostic alone) after weeks or months of streptococcal infection.

Symptom

- * Involuntary movements: sudden involuntary jerky movements of:
 - The limbs (fall of objects from the hand and unsteady gait).
 - The tongue (interrupted speech).
 - The face (abnormal movements).
- * Emotional instability (sudden laughing or crying).

Sign

- * Hypotonia and hyporeflexia:
 - Inability to keep the arm protruded but wrist flexion and finger hyperextension occurs (dinner fork appearance).
 - Milkmaid's grip (the inability to maintain voluntary contraction of hand muscles on active grip).
 - Inability to keep the tongue protruded.
 - Hypotonia may be severe enough to cause paralysis.

D. Erythema marginatum (<5%)

- * Evanescent wavy rings of erythema with sharp margins, not itchy nor painful.
- * Most common site is the trunk and proximal part of the extremities.

E. Subcutaneous nodules (1%)

- * Firm, painless, mobile nodules under the skin present mainly over the extensor surfaces and bony prominences e.g. scapula, elbow & shin of the tibia.
- * It is usually associated with severe carditis.

3 Discuss briefly clinical features of rheumatic chorea.

- * More common in girls > 8 years due to affection of the basal ganglia.
- * Could occur alone (diagnostic alone) after weeks or months of streptococcal infection.

Symptom

- * Involuntary movements: sudden involuntary jerky movements of:
 - The limbs (fall of objects from the hand and unsteady gait).
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- * Hypotonia and hyporeflexia:
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 - Inability to keep the tongue protruded.
 - Hypotonia may be severe enough to cause paralysis.

4 Discuss briefly how to diagnose acute rheumatic fever.

Diagnostic criteria (Revised Jones criteria)

Required criteria

Attack	Criteria
First attack	[(2 major) or (1 major + 2 minor)] + Evidence of recent streptococcal infection
Recurrent attacks	[(2 major) or (1 major + 2 minor) or (3 minor)] + Evidence of recent streptococcal infection

Major criteria

- 1 Arthritis (75%).
- 2 Clinical or subclinical carditis (50%).
- 3 Sydenham's chorea.
- 4 Erythema marginatum (<5%).
- 5 Subcutaneous nodules (1%).

Minor criteria

- * Fever.
- * Arthralgia (is not considered in presence of arthritis).
- * Increased CRP, ESR, and/or total leucocytic count.
- * Prolonged PR interval in ECG (is not considered in presence of carditis).

Evidence of recent streptococcal infection

- * Positive throat culture.
- * Increased ASO titer or anti-DNase titer.
- * History of scarlet fever.

5 Enumerate three minor manifestations of acute rheumatic fever.

- * Fever.
- * Arthralgia (is not considered in presence of arthritis).
- * Increased CRP, ESR, and/or total leucocytic count.
- * Prolonged PR interval in ECG (is not considered in presence of carditis).

6 Mention pathogenesis, diagnosis, and treatment of rheumatic fever.

(a) Etiology and pathogenesis

Rheumatic fever occurs after prior (3-4 weeks) streptococcal pharyngitis with group A beta hemolytic streptococci (GABHS) by one of the following theories:

- * Crossed reactivity due to similar antigenicity:
 - There is a similarity between protein of GABHS and some proteins in heart, joints, brain, and skin.
 - Antibodies against GABHS cross-react with human tissues producing immune complexes that start inflammatory process that damage human tissue.
- * Altered antigenicity:
 - Less acceptable theory that suppose that there is direct infection of heart, joints, skin, and brain with subsequent alteration in the antigenic properties that stimulates autoimmune inflammatory response.

(b) Diagnosis: diagnostic criteria (Revised Jones criteria)

Required criteria

Attack	Criteria
First attack	[(2 major) or (1 major + 2 minor)] + Evidence of recent streptococcal infection
Recurrent attacks	[(2 major) or (1 major + 2 minor) or (3 minor)] + Evidence of recent streptococcal infection

Major criteria

- ① Arthritis (75%).
- ② Clinical or subclinical carditis (50%).
- ③ Sydenham's chorea.
- ④ Erythema marginatum (<5%).
- ⑤ Subcutaneous nodules (1%).

Minor criteria

- * Fever.
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- * Prolonged PR interval in ECG (is not considered in presence of carditis).

Evidence of recent streptococcal infection

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(c) Treatment

Treatment of acute phase

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