Validity of throat culture in rheumatic carditis

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Abstract

A prospective study of 30 patients with acute rheumatic fever (ARF) as diagnosed by the revised Duckett Jones criteria was conducted during the period from October 1997- February 1998 in Mosul city. Special emphasis on the clinical presentation and laboratory investigation including throat culture (TC) for streptococci and antistreptolysin O (ASO) titer were performed to assess the validity of both tests in patients with and without rheumatic carditis.

Arthritis was diagnosed in 24 patients (80%) most commonly involving big joints. Carditis was a complication in 8 patients (26.6%). Fever، high erythrocyte sedimentation rate (ESR), and high ASO titer were common for all patients. Throat culture was positive in 8 patients (26.6%) all without carditis, Those with carditis were negative for TC andthere was no history of prior antibiotic administration. It is concluded that TC for patients with carditis is not essential as evidence of previous streptococcal infection and raised ASO titer is enough.

Keywords : rheumatic fever ، carditis ، ASO titer ، throat culture .

Introduction

Rheumatic fever is a multisystem disease manifested by arthritis, carditis, chorea, erythema marginatum (EM) and subcutaneous nodules with fever and high ESR.(1) Both acute and recurrent attacks are triggered by group A beta hemolytic streptococcal infection of upper respiratory tract, (2).Less than 1% of patients with streptococcal pharyngitis develop rheumatic fever, (3). The rise in ASO titer with positive TC are still important diagnostic tools for diagnosis of recent infection with hemolytic streptococci, (4). Positive TC is found in minority of cases (15-20%), when rheumatic fever manifest itself,(5) because the disease is a post – streptococcal infection complication with a lag period of 2-3weeks.

Patients and methods

The study includes 30 patients ، 18 females and 12 males with ages ranging from 5 – 20 years, the diagnosis of ARF was made by applying the revised Jones criteria.(6)

Arthritis was diagnosed when the joint was red, hot, swollen and tender with limited movement . carditis was diagnosed when one or more of the following criteria was present for the first time: (5-10)

a-significant apical systolic murmur conducted well to axilla , scored at least grade 2 intensity on a scale of 6.(11-13)
b- apical mid diastolic murmur.(14,15)
c- basal diastolic murmur.
d- cardiomegaly.
e- congestive heart failure.

For every patient the following investigations were performed ESR, ASO titer, hemoglobin level (Hb), chest x-ray, electrocardiography (ECG), and throat culture for streptococci. For ASO titer estimation 2.5 ml of venous blood was allowed to clot and centrifuged, then clear serum was used, the sera were tested for the presence of ASO titer by using the direct latex agglutination test [Avitex – Aso Omega diagnostics Limited].

The test was repeated after a week for those initially with low titer, a high titer in both situations above 300 Todd units was accepted as indication for recent streptococcal.(13) Throat swab were inoculated on blood agar plates under aerobic condition for 48 hours . Diagnosis of beta haemolytic streptococci was established by gram stain biochemical tests including sensitivity to Bacitracin disc and Lancifield grouping.

Results

Out of the thirty patients with ARF, there were eighteen males and twelve females ranging in age from 5-20 years, as shown intable 1. Fever and arthritis were the most common features . arthritis was present in 24 patients involving mainly the big joints of the upper and lower limbs like ankle, knee, elbow and wrist. The small joints were not affected (Table 2). No cases of EM and SN were seen.

It is evident from table 3 that the overall ASO mean is 578 Todd units / ml, which is higher than normal level 300 Todd units / ml, in comparing males and females there was no significant difference in ASO titer.

History of sore throat was found in 20 patients , antibiotic administration in from of procaine penicillin, ampicillin, or erythromycin were noted in 10 patients, all were without carditis .

Table (4) shows that carditis was present in 8 patients. Throat culture was negative in all of them while it was positive in 8 patients without carditis.

Discussion

More than two third of patients were between 5-15 years of age, with a history of preceding tonsillitis in 20 patients, which goes well with other report arthritis was of the classical migratory type affecting the big joints mostly in the lower limbs EM & SN were not found in our series as they are usually rare manifestations. Throat culture was positive in 8 patients only, all were without carditis. The low isolation rate is probably due to antibiotic administered earlier or due to prolong period between streptococcal infection and initial features of rheumatic fever.

Difficulty also arise in assessment of TC result because streptococci are normally present in children and normal individuals and also the use of single culture. These make TC is less satisfactory than antibody test as a supporting evidence of recent streptococcal infection . As all our patients with carditis has no prior antibiotic therapy, this will minimize the possibility of negative result due to antibiotic and might explain the presence of this serious complication because the other 10 patients with prior antibiotic therapy had no carditis

Mild symptoms of rheumatic fever dose not accuratelyreflect the severity of the disease which can cause permanent heart disease with certain mortality.

We conclude that due to negative culture in patients with carditis that this test is not of value as initial investigation if carditis is present, an one should depend on increase ASO titer as evidence of previous streptococcal infection.

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Table 1: age and sex distribution

Age/year	Female	Male	Total	%
5 – 10	10	5	15	50
11 – 15	6	4	10	33.3
16 – 20	2	3	5	16.7

Table 2: clinical features of initial attack of ARF

Major criteria	No.of patients	%
Arthritis	24	80
Carditis	8	26.6
Minor criteria		
High ESR	30	100
Fever	30	100

Table 3: mean ASO titer in patients with ARF

No. of patients	Mean ASO titer ± SD
12 males	616 ± 28.4
18 females	547 ± 22.6
30 total	578 ± 24.2

Table 4: results of TC for strep. In patients with ARF

No. of patients	Carditis	TC
8	+	-
8	-	+
14	-	-

أهمية زرع مسحة البلعوم في حالات التهاب القلب الروماتيزي

شملت هذه الدراسة 30 مريضا مصابا بالحمى الروماتيزمية شخصوا بواسطة مقياس جونس المنقح. تم التأكيد على العلامات السريرية وعلاقتها بالمكورات السبحية عن طريق قياس عيار الحال السبحي ومسحه زرع البلعوم خاصة بالمرضى المصابين بالتهاب القلب.
كان التهاب المفاصل موجوداً في 24 حالة (80%) والتهاب القلب في 8 حالات (26,6%) وكانت الحمى مع زيادة ترسب الكريات الحمر موجودة في جميع الحالات.
تم دراسة الدليل على وجود إلتهاب حديث للمكور السبحي بشكله المباشر بوجود الجرثومة في مسحة البلعوم والذي كان موجود في 8 حالات فقط 26,6% جميعها كانت خاليه من التهاب القلب.
كان عيار الحال السبحي مرتفعاً في جميع الحالات فوق 300 وحده / ملليتر، كان الاستنتاج أنه لا داعي لعمل مسحه البلعوم في الحالات التي يكون فيها التهاب القلب موجوداً مع الحمى الروماتيزمية كدليل على وجود إلتهاب حديث بالمكورات السبحية والاكتفاء بقياس عيار الحال السبحي فقط .