EVALUATION OF ANTISTREPTOLYSIN-O TITRE AS A DIAGNOSTIC SEROLOGICAL TEST IN PAEDIATRIC PATIENTS PRESENTING WITH JOINT PAIN AND FEVER

Microbiology

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ABSTRACT

Introduction- Group A beta hemolytic streptococci is the most frequent agent causing pharyngitis. Rheumatic fever is a febrile disease affecting connective tissue of heart, joint, central nervous system, skin & subcutaneous tissue. Commonest age group affected 5-15 years. **Material and Method** – Samples were collected from patient attending opd and indoor of paediatric deptt of pmch,patna. Patients belonging to 5-15 age group were selected. ASO titre was done by latex agglutination test. Both qualitative and semi quantative test was done. **Result and Discussion**- Total no. of cases 70, in 5-10 years group, total no. of case was 45 which consisted of male 29 & 16 female. In 11-14 year age group out of 25 cases, 17 males and 8 female. In 5-10 years age group out of 45 cases 33 showed significant ASO titre (73.33%) and in 11-14 Years age group out of 25 cases 18 showed significant titre (42%). The significant rise in ASO titre is helpful in establishing the diagnosis of joint pain in Rheumatic fever. ASO titre is still used in developing country such as India for detection of gp A streptococcal infection & Rheumatic fever as sequelae.

KEYWORDS

ASO Titre, Antistreptolysin O titre, Gp A streptococcal infection, Rheumatic fever

INTRODUCTION

The disease caused by streptococci pathogenic for men is due to number of factors like bacteria, host and environment. Group A beta hemolytic streptococcus is the most frequent agent causing pharyngitis. Pharyngitis caused by group A streptococci has been linked with etiopathogenesis of Rheumatic fever and Rheumatic heart disease.

Rheumatic fever is a febrile disease affecting the connective tissue of heart, joint, central nervous system, skin and subcutaneous tissue. It is initiated by throat infection by Group A beta hemolytic streptococci. Commonest age group involved is 5-15 years.

The most recent modifications of Jones criteria. According to this there are major criteria because they are commonly found in patient with rheumatic fever. These include carditis, migratory polyarthritis, sydenham's chorea, subcutaneous nodule and erythema marginatum. Minor criteria are non specific A) clinical-fever & arthralgia (B) Laboratory- elevated acute phase reactants and Prolonged P.R. interval. To fulfill the jones criteria either two major criteria, or one major and two minor criteria plus evidence of an previous streptococcal infection are required.

Evidence of recent streptococcal infection include a throat culture and various streptococcal antibody test e.g. Anti streptolysin O (ASO), anti deoxyribonuclease B, antibodies against hyaluronidase, streptokinase and erythrogenic toxin. ASO in contrast to other test is most satisfactory and most widely used antibody test. Anti streptolysin- O antibody test is more reliable indicator of recent infection.

MATERIALANDMETHOD

The material or serum samples were collected from the patient attending outdoor and indoor of paediatric department of Patna Medical College & Hospital, Patna.

History was taken with special reference to joint pain and fever. Patients name, age, sex, address, involvement of joint and past or present illness of join pain. ASO Test is done by Latex Agglutination. Patients belonging to 5-15 years age group was selected.

a)Anti streptolysin- O titre by latex agglutination test.

Principle-Polystyrene latex particle are coated with purified and sterilised streptolysin 'O' i.e antigen which react with its corresponding anti-streptolysin O antibody present in the sera of test sample resulting in agglutination of latex particles. Increased ASO titre of more than 200 IU/ml indicate the past or present acute streptococcal infection.

Sample: It is recommended that the test to be performed only on serum. It should be not heat inactivated.

- 1) Qualitative Slide Test: 5ml of venous blood was collected and serum was separated from it. Serum was then centrifuged. One drop of undiluted serum was placed with in circled area on the slide provided with the kit. Agglutination visible with in 2 minutes to be interpreted as positive test, corresponds to ASO Titre of more than 200IU/ml. when there was no agglutination within 2 min, it is considered as negative test, indicating ASO titre of less than 200 IU/ml.
- 2) Semiquantitative slide test: All samples giving positive result in qualitative test were tested by semi-quantitative test. Dilution of the serum sample was prepared.

Series of 5 test tubes were taken. First tube contain 1 ml of undiluted serum and other four contained 0.5 ml of undiluted serum was dispersed into second tube containing 0.5 ml of normal saline. So, serum dilution of 1:2 and so on 0.5 ml from second tube is transferred to third, making dilution of 1:4, 0.5 ml from third tube was dispersed in fourth tube dilution of 1:8 & 0.5 ml from fourth tube is added to fifth with dilutions of 1:16, 1:2 dilution corresponds to 400 IU/ml, 1:4-800 IU/ml 1:8-1,600IU/ml & 1:16-3,200IU/ ml. With the help of plastic dropper one drop of diluted serum was added on to the circle area & ASO latex reagent was added. It was mixed and after rocking the slide macroscopic agglutination was observed within 2 min. Result-ASO titre of the test sample was indicated by corresponding value in IU indicated against highest serum dilution, which gave positive agglutination within 2 min.

RESULTSANDDISCUSSION

Total no. of cases were placed in two age groups. In category I children of 5-10 years of age and in category II adolescent of 11-17 years of age group were included, In 5-10 years age group total no. of cases 45, consisting of 29 male and 16 female and in 11-14 years age group total no of cases 25, 17 males and 8 females. Nandi S, Kumar R (2002) have also observed that highest incidence of rheumatic fever is between 5-15 years of age.

In my study there is male predominance but no. of samples were less. This finding corresponds to T.L Th a Jansen, M jansen 1998 gave the view that there is male predominance in rheumatic fever. Srivastava & Tandon (1983) viewed male & female were affected equally.

I have found that 37 patients were suffering from foot pain in multiple large joint mainly knee, hip and ankle. 9 cases were with single big joint involvement mainly knee and 79 cases were involvement of multiple big and small joint. 52.86% involvement of multiple big joint only 7.14% involvement of smaller joint. According to Sanyal et al (1982) articular manifestation in rheumatic fever presents as migratory polyarthritis most often larger joint as knee & ankle.

It is found that 33 cases out of 45 in age group of 5-10 years have

significant ASO titre and 18 out of 25 cases have significant titre. 73.33% in 5-10 years age group. Sunil Sethi, Kriti Kaushil, Kavya Mohandas (Chandigarh) (2002) in their study of 200 children of 5-15 yrs of age found 239 IU was upper limit. Karmakar MG, Venu Gopal, Vineeta, Jhoshi Lella (2004). In study of 200 individual in Mumbai found ie. Upper limit of normal level of ASO in Adult in 195 IU and 305 IU for children. Cruickshank (1976) opinion was ASO titre of 200 unit or more is indicative of streptococcal infection.

REFERENCES -

1. Ananthnarayan & Paniker's- Textbook of Microbiology 9th edition pg. 215-216.
2. Committee to revise the Jones criteria American Heart Association –Jones criteria revised for guidance in the diagnosis of RF 1965;32, 664-668.
3. Rajkumar S, Krishnamurthy R-isolation of group A beta hemolytic streptococci in tonsillopharynx of social children in Madras and its relationship with clinical feature, Jpn J. Infect Dis 2001;54:13.
4. Shete A, Kaplan EL: Clinical use and interpretation of group A streptococcal Ab Test, Paediatric infectious journal 2002;21(5):420-430.
5. Stollerman GH, Siegel AC, Johnson EE; Variable epidemiology of streptococcal disease and changing pattern of Rheumatic fever 1965;34:45