

# Prevalence of ASO Antibodies among Suspected Patients for Streptococcal Infections at Sir Takhtsinhji Hospital, Bhavnagar

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## Abstract

**Introduction:** Streptococcus pyogenes is the commonest human pathogen causing widespread infections. Streptococcal antibody tests like the antistreptolysin O titre (ASO), the antideoxyribonuclease-B titre (anti-DNAase-B, or ADB) and the streptozyme test can be used for diagnosis of streptococcal infections. ASO test is done using latex agglutination method. **Aim:** To detect prevalence of anti-streptolysin O (ASO) antibodies in serum samples received in microbiology laboratory from patients of suspected streptococcal infections. **Material and Methods:** This study was conducted in serology section of Microbiology laboratory, Sir Takhtsinhji Hospital, Bhavnagar between the periods of June 2019 to October 2020. Serum samples received in serology section of microbiology requested for Anti streptolysin O test were tested by ASO- latex slide agglutination test by Pathozyme Diagnostics. Total 476 serum samples were tested. The results were recorded and analysed for the study. **Results:** Total prevalence for ASO positive serum samples were 46(9.8%), the highest prevalence 15% found in age group of 0-20 years. **Conclusion:** For detecting antecedent streptococcal infection the estimation of ASO antibodies is a simple, cost effective way. The increased level of ASO can support the diagnosis of rheumatic fever. ASO prevalence was found to be highest in the 0-20 year's age group.

**Keywords:** Antistreptolysin O Test, antideoxyribonuclease-B Test, Latex Slide Agglutination Test.

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## INTRODUCTION

Streptococcus pyogenes (Group a Streptococcus) is one of the most common and ubiquitous human pathogens. It causes a wide spectrum of infections, the most frequent of which are acute pharyngitis and impetigo. Other manifestations of infection with Group a Streptococcus include sinusitis, otitis, peritonsillar abscess, scarlet fever, erysipelas and cellulitis and the severe soft tissue infections necrotizing fasciitis and myonecrosis [1-4].

It is also associated with two main non-suppurative sequelae: acute rheumatic fever (ARF) and acute glomerulonephritis (AGN) [5]. Rheumatic fever causes inflammation of tissues and organs and can result in serious damage to the heart valves, joints, and skin.

Susceptibility to rheumatic fever in certain individuals has been depending to a number of factors. These include genetic determinants, for example, presence of certain markers such as the B-cell

alloantigen and HLAs. One of the factors originally considered in rheumatic fever susceptibility is an innate state of immune hyperresponsiveness, particularly to streptococcal antigens [6].

There are two tests to detect recent streptococcal throat infection: positive culture for group A Streptococcus from the throat or anti-streptococcal antibody tests. A throat culture in many cases they are spontaneously negative, due to previous antibiotic treatment, or positive due to a carriage state [7, 8].

Positive throat culture are obtained only in about 11% at the time of presentation of acute rheumatic fever, moreover were presence of organism in the throat can also indicate carrier state which is seen in 2.5-35.4% of the individuals. In such cases the presence of immune response of host is the only evidence of the recent streptococcal infection [9]. Measurement of antibodies to streptococcal antigens is necessary for the diagnosis of the preceding Group A Streptococcal infection. ASO levels rapidly rise after 3-

4 weeks of post streptococcal infection and remains elevated for months.

Streptococcal infections can be diagnosed by following antibody tests.

Three streptococcal antibody tests are available:

1. The antistreptolysin O titre (ASO),
2. The antideoxyribonuclease-B titre (anti-DNAase-B, or ADB),
3. The streptozyme test [10, 11, 1]

The most standardized serological test is ASO. It is useful in the diagnosis of streptococcal infections or complications, also in the follow-up process and in evaluating the effectiveness of treatments. It measures the ability of serum to neutralize streptolysin O [12].

## MATERIAL AND METHODS

This study was conducted in serology section of Microbiology laboratory, Sir Takhtsinhji Hospital, Bhavnagar between the periods of June 2019 to October 2020. Samples received in serology section of microbiology requested for Anti streptolysin O test were tested by ASO- latex slide agglutination test by Pathozyme Diagnostics. The sample was centrifuged at 3000 rpm for 2 minutes. The serum was then separated by using micropipette. Total 476 serum samples were tested for ASO latex slide agglutination test.

Before testing the test serum and kit reagents were kept at room temperature. 25µl of patient's serum within the circled area were placed on the clean and dry special glass slide provided in the kit. Drop of well

mixed ASO latex reagents was added to serum. The reagent and serum were mixed by using the applicator stick. The slide was rotated and agglutination observed after 2 minutes [13, 14]. Results were compared with positive control and negative control. ASO titer of the test samples was indicated by the corresponding value in IU indicated against highest serum dilution which gives positive agglutination within 2 minutes. ASO titre more than 200 IU was considered significant.

## RESULTS

The 476 serum samples were processed for detection of Anti Streptolysin O antibodies. As shown in figure-1 46 samples were positive and 430 samples were negative. Total prevalence for ASO positive serum samples were 46(9.8%) for Anti Streptolysin O antibodies.

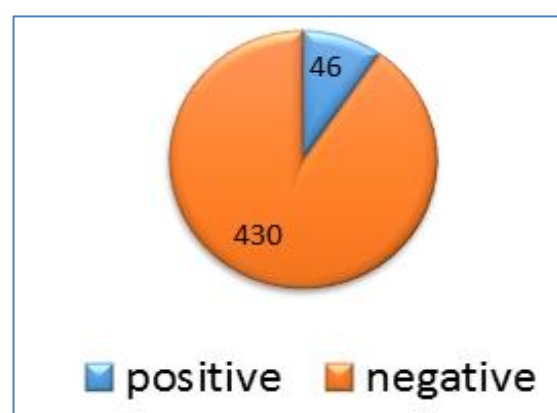


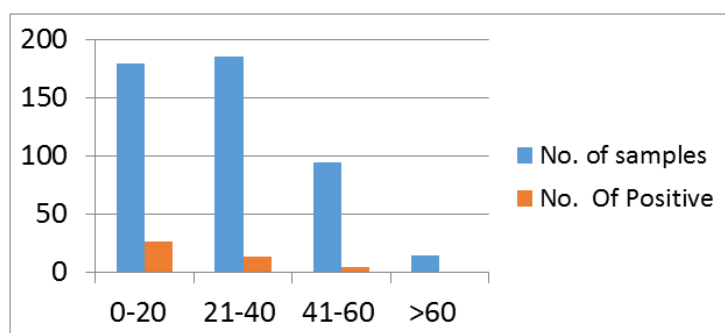
Fig-1: Total number of ASO positive and ASO negative cases

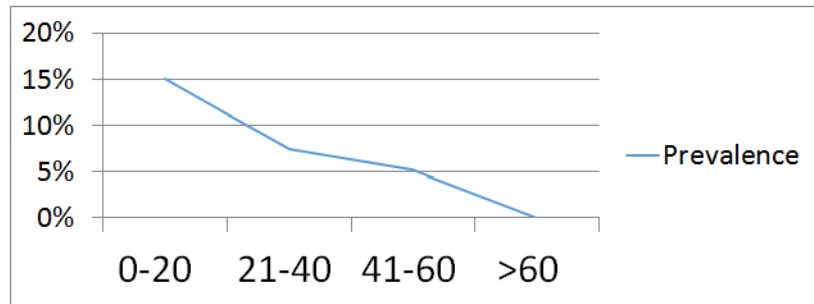
Table-2: The number of positive cases in different age group

Age group (years)	No. of samples	No. Of Positive	Prevalence
0-20	180	27	15%
21-40	186	14	7.5%
41-60	95	5	5.2%
>60	15	0	0%

The number of positive cases in different age group show in table 2. In (0-20) year of age total 180 sample receive, out of this 27 sample found positive for ASO antibody, prevalence rate 15%. In (21-40) year of age total 186 sample receive, out of this 14 sample

found positive for ASO antibody, prevalence rate 7.5%. In (41-60) year of age total 95 sample receive, out of this 05 sample found positive for ASO antibody, prevalence rate 5.2%. In more than 60 year of age total 15 sample receive, no positivity found in this age group.





**Fig-2: ASO positive cases according to age wise distribution**

In (figure -2) the highest prevalence of ASO antibody positive samples were 27 samples out of 180 samples (15%) found in age group of (0-20 years). Very low prevalence found in age group of 41-60 years which is 5 positive serum samples for ASO antibody out of 95 total samples. As shown in the previous graph, the prevalence rate declines as age increases, so it is more prevalent among younger age group.

## DISCUSSION

The serological test for streptolysin O antibodies is commonly used to aid in the diagnosis of post-streptococcal non-suppurative sequelae such as acute rheumatic fever and glomerulonephritis [15, 16].

The extra-cellular Group A Streptococcus antigens: (ASO, DNase B and streptokinase antibodies) is measured for the diagnosis of rheumatic fever. However, showed that the addition of anti-streptokinase antibodies measurement did not increase the sensitivity and specificity of serological testing for the diagnosis of acute post streptococcal disease [17].

Our study showed that from total 476 samples tested 46 samples were found ASO positive, prevalence rate for ASO was 9.8%, whereas the same study which was conducted in Nepal showed 45.45 % prevalence of ASO positive cases [18]. Similar study was also performed where 20.89 % prevalence was observed [19]. Our study showed that the highest prevalence 15% of ASO antibody found in age group of (0-20 years). Where the same study which was conducted in Bhadrak region showed that the highest prevalence 27% of ASO antibody was found in age group of (21-40 years) [20]. This clearly indicates that the ASO level vary with age group of the study population and geographical distribution.

## CONCLUSION

For detecting antecedent streptococcal infection the estimation of ASO antibodies is a simple, cost effective way and test report can be given rapidly and test is correlated with clinical finding for routine diagnostic work, and it is useful without depending upon other test. The prevalence of Anti streptolysin O (ASO) antibody in this study among total cases was 9.8%. The prevalence of ASO was found to be highest

in the age group (0-20year), which probably reflects a high background prevalence of streptococcal infection in this age group. As the data studied here is not enough for making any conclusion on prevalence of ASO in a particular age, so we need to do more studies on prevalence of ASO in different population.

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