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## Original Research Article

## Determination of anti-streptolysin – O titer in suspected cases of streptococcal infection

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## ABSTRACT

**Introduction:** The Group A beta hemolytic streptococcus has remained a major human infective agent for hundreds of years. Group 'A' beta hemolytic streptococcus related ailment and sequelae keep on affecting general public and national economy as they mostly influence kids and youthful grown-ups. Current research aimed to determination of anti-streptolysin –o titer in suspected cases of streptococcal infection.

**Aim& Objectives:** Determination of anti-Streptolysin-O (ASO) titer in suspected cases of streptococcal infection.

**Materials and Methods:** The measurement of ASO levels was done by semi-quantitative analyzer on photometric and colorimetric systems. 107 blood samples were taken in our study. This study was conduct in serological section of microbiology department of Teerthanker Mahaveer Hospital & research centre Moradabad.

**Results:** A total 107 samples were tested in this study. Of these, 23(21.5%) were found to be positive for the presence of ASO having titre of >200IU/mL.

**Conclusion:** This study will be useful to evaluate utility of sero-diagnosis in our catering population and found useful in early diagnosis and treatment of these pathogens. Treatment can be initiated at an early stage leading to reduction in complications and associated mortality.

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## 1. Introduction

The Group A beta hemolytic streptococcus has remained a major human infective agent for hundreds of years. Group 'A' beta-hemolytic streptococcus-related ailment and sequelae keep on affecting the general public and the national economy as they mostly influence kids and youthful grown-ups. Streptococcal infections and their symptoms are rigorously researched, but diagnostic and clinical dilemmas exist surrounding their treatment. From slight higher respiration tract infection and invasive

sicknesses together with necrotizing fasciitis and toxic shock syndrome, this organism reasons a huge quantity of infection in humans. Although clinicians, scientists, and public fitness officials do their exceptional understand the pathological technique and design remedies for the disease, the most critical trouble is the non-suppurative sequelae of infection, which includes acute rheumatic fever and streptococcal glomerulonephritis.<sup>1</sup>The latest report from a tertiary medical institution in New Delhi confirmed an increase in invasive streptococcal gentle tissue and disseminated infections, although some of them passed off in patients who made basic scientific and surgical conditions.<sup>2</sup> Rheumatic fever is associated with historical

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diseases, although Dubai and Siddenham conceptualized rheumatic fever as a syndrome such as arthritis, heart infection and chorea within the 17th century. Although the extreme attack charge of rheumatic fever and rheumatic heart disease has declined in some elements of the globe, they're nevertheless essential reasons of cardiovascular disorder morbidity and mortality in India.<sup>3</sup> The ASO test is an worldwide regular test that has been generally used to detect G.A. 80-85% of patients by acute rheumatic fever with streptococcal infection have high titer. Studies have shown that the potency of anti-streptolysin O titer with age geographic location, season and infection site.<sup>4</sup> If relying on a single determination of anti-streptolysin O titer, it's important to identify the upper limit of the normal antistreptolysin O titer. Therefore, a particular sample can be compared by a fixed normal limit.<sup>5</sup>

## 2. Materials and Methods

The measurement of ASO levels was done by semi-quantitative analyzer analyzer on photometric and colorimetric systems. 107 blood samples were taken in our study. This study was conducted in serological section of microbiology department of Teerthanker Mahaveer Hospital & research centre Moradabad.

### 2.1. Type of study

Observational.

### 2.2. Study period

January 2020 to December 2020.

### 2.3. Sample collection

#### 2.3.1. Specimen collection

After disinfecting the area with alcohol, collect approximately 2-4 ml of blood in a sterile vial, then perform venipuncture and take all sterile measures.

Clot half of the blood at room temperature for half an hour, and then remove the clot to separate the serum. Centrifuge it at 3000 rpm (rotation per minute) for 5 minutes. The serum is used for diagnosis of ASO test.

#### 2.3.2. Inclusion criteria

1. Patients of both sexes will be included.
2. Patient with suspected throat infection attending IPD and OPD in TMU Hospital.

#### 2.3.3. Exclusion criteria

1. Those patients whose denied consent.

## 2.4. Methodology

### 2.4.1. Test principle

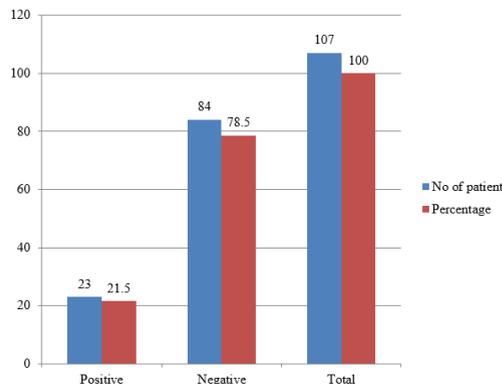
Determination of the concentration of ASO titer by Coral photometric measurement immunological reaction between latex particles coated with Streptolysin O antibody present in this sample.<sup>6</sup>

### 2.4.2. Test procedure

The serum samples and test kit contents were kept in room air till they get room temperature. The test was done on 107 serum samples. First wash with flash water. Then set the calibrator. Now set the sample then run sample by kit protocol. Take a micro tube and take 450  $\mu$ l R<sub>1</sub> next 50  $\mu$ l R<sub>2</sub> mix well and five minute incubate room temperature next 5  $\mu$ l serum sample. Then wait for test result reading. The ASO level of the sample was derived from a calibration curve using an appropriate mathematical model log. The calibration curve was obtained from 5 calibrators at different levels of 50 IU, 100 IU, 200 IU, 400 IU and 800 IU.<sup>7</sup>

## 3. Observation & Result

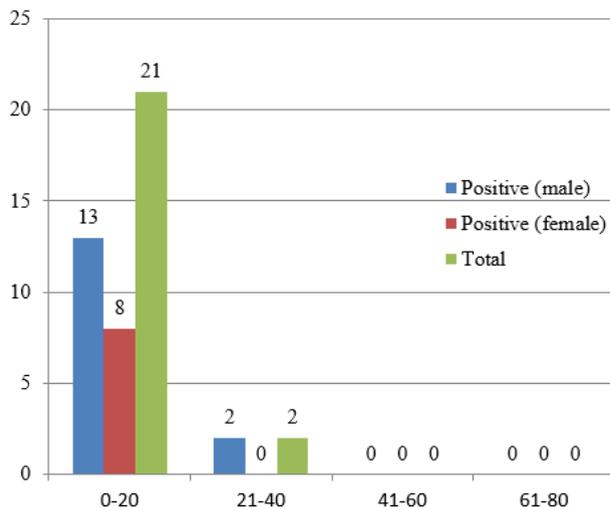
The present study was conducted in TMMC&RC, Hospital Moradabad. A total of 107 blood samples for detection of ASO titer processed in the microbiology department in the given study period.



**Fig. 1:** Bar diagram showing result for ASO titer

The data showing result for the ASO titer in suspected streptococcus infection in which we reported that there are 23 (21.5%) samples were positive and rest 84 (78.5%) samples were found negative as shown in the above table.

The above table and diagram shows Age wise distribution and positive cases in both sexes. In male patients we found 15 cases positive for ASO titer out of which majority of cases from 0-20 year's age group. In case of female patient's findings were 8 positive cases that were only from the 0-20 year's age group. So the prevalent age group for ASO titer in streptococcal infection is 0-20.



**Fig. 2:** Age wise occurrence of positive cases and percentage

#### 4. Discussion

The research is mainly helpful to verify the existence of streptococcal infection caused by the previous increase in ASOT, observe the ongoing pharynx group A streptococcal infection and evaluate the red blood cell sedimentation rate. Echocardiography is not part of the diagnostic criteria, but it is usually performed as part of the initial examination to clarify the heart involvement.<sup>8</sup>

Contained by 9 days after the start of ARF, group A streptococcal pharyngitis is usually treated with antibiotics to prevent most cases of ARF, so there is no effective immune response treatment method. At present, salicylate and antibiotics for any GAS infection are still the cornerstones of treatment in most cases. Salicylate can relieve fever and inflammatory diseases.<sup>9,10</sup>

In our study, there was total 107 sample processed in which 23 samples shows positive ASO titer. Prevalence of streptococcal infection is 21.5% in all age group and sex this study show almost similar result to a another study Sharma A et al (2016)<sup>11</sup> having prevalence rate of 22.8%, and a another show high prevalence rate 35.69% as compare to this study Solanki S et al (2020).<sup>12</sup>

In this study most of the patients of streptococcal infection are IPD patients which are 78% and 22% OPD patients this show that streptococcal infections cause severe diseases and patients must be admitted in hospital.

In this study age wise distribution of patients shows that all positive cases resembles to the age group of 0-40 years of age and a study Sharma A et al (2016)<sup>11</sup> also shows that streptococcal infection infects same age group due to this we observe that streptococcal infection infects mostly pediatric population because this infection is spread by close contacts with another person such places are school, daycare centers

etc.

In our study sex wise distribution shows that majority of patients 65% are male and 35% female. A study Solanki S et al (2020)<sup>12</sup> also show that maximum numbers of infected cases are male 54.85% and 45.15% are female.

#### 5. Conclusion

This study is providing current information regarding the occurrence of streptococcal infections in Moradabad U.P. Our hospital caters large rural as well as urban population. This will also provide an opportunity to prevent infection by effective control measures like to aware the general population in this area about infection spreads and who we take proper safety measures. Treatment can be initiated at an early stage leading to reduction in complications and associated mortality. This study further gives an opportunity to fight this disease unitedly by clinicians and microbiologists, to validate clinical presentation of streptococcal infection and to understand the relation between clinically suspected and laboratory confirmed cases. This study also extends to evaluate utility of sero-diagnosis in our catering population and found useful in early diagnosis and treatment of these pathogens. Rapid and specific diagnostic method like PCR and ELISA can also be used for early diagnosis of glomerulonephritis and rheumatic heart disease. Now molecular methods are coming in a big way for the diagnosis of these diseases thereby making the confirmation simpler in future and detection of ASO antibodies is a simple and cost effective way to detects streptococcal infection. An early empiric therapy can be given to reduce serious complication and mortality. General health education and public awareness about the disease, including the methods of transmission, is necessary for their prevention and control. As this study had small sample size large scale studies are needed to understand the magnitude of streptococcal infection, in this region and other parts of India.

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#### 8. Conflicts of Interest

The authors declare no potential conflict of interest with respect to research, authorship, and/or publication of this article.

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