



SEROEPIDEMIOLOGICAL STUDY OF ANTISTREPTOLYSIN O ANTIBODIES IN A TERTIARY CARE CENTRE IN SOUTH INDIA

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ABSTRACT

INTRODUCTION: Antistreptolysin O (ASO) antibody titers are commonly employed in the diagnosis of Group A beta-hemolytic streptococcal infections and their sequelae. The present study was undertaken with the aim of estimating the seroprevalence of ASO antibody titers > 200 IU/mL in patients attending a tertiary care hospital in Hyderabad, Telangana.

MATERIALS AND METHODS: A retrospective study of specimens tested during a one and half year period from January 2015 to June 2016 was undertaken. A rapid, latex, slide agglutination method with a lowest detection limit of 200 IU/mL was employed. Demographic details of patients were noted.

RESULTS: The prevalence of ASO titers greater than 200 IU/mL was found to be 27 % (71/261) in the study population. Majority of patients were in the age group of 0-20 years with a female preponderance.

CONCLUSIONS: The seroepidemiological data related to ASO titers from a tertiary healthcare facility in South India was elucidated.

KEYWORDS : Antistreptolysin O, seroepidemiological, seroprevalence, ASO titre

INTRODUCTION

Streptococcal antibody tests are used for the diagnosis of antecedent infections caused by the group A streptococcus (GAS) and are particularly useful for the diagnosis of acute rheumatic fever and acute post-streptococcal glomerulonephritis¹. Rheumatic heart disease (RHD) and Rheumatic fever (RF) remain significant causes of cardiovascular disease and mortality in children particularly in the developing countries¹. RF is estimated to affect 20 million people and is a leading cause of death during the first five decades of life². It is endemic in developing countries with annual incidence of 100-200 cases per 100,000 school aged children³. RHD and RF are autoimmune diseases that follow infection with GAS; however, the isolation of GAS is uncommon (<15%), and so confirmation of the diagnosis often relies on streptococcal antibody tests⁴; the most frequently performed tests are those that determine the anti-streptolysin O (ASO) titer and the anti-DNase B (ADB) titer^{5,6}. The estimation of ASO antibodies is a simple, cost effective way for detecting previous streptococcal infection and their sequelae. The present study was undertaken with the aim of estimating the seroprevalence of ASO antibody titers > 200 IU/mL in patients attending a tertiary care hospital in Hyderabad, Telangana.

MATERIALS AND METHODS

A retrospective analysis of specimens tested in the Serology section of the Clinical Microbiology Laboratory of Gandhi Hospital, attached to Gandhi Medical College, Hyderabad, Telangana during a one and half year period, 01 January 2015 to 30 June 2016, was carried out. Data retrieval was done through the Health4All software application which was used as a laboratory information management system. Of the 26,552 specimens submitted for serological analysis during this period, 261 specimens were tested for the presence of elevated ASO titers, as per the available online data. Tests were performed by rapid, latex slide agglutination method (Lowest detection limit: 200 IU/mL) as per manufacturer's instructions and the results were tabulated. Demographic characteristics of the study population, namely age and gender, were documented and the location of the patients at the time of sample submission was noted.

RESULTS

The prevalence of Antistreptolysin O (ASO) antibody titers greater

than 200 IU/mL was found to be 27% (71/261) in the study population. The proportion of males and females was 47% and 53% respectively. Majority of the patients i.e., 70.5 % were referred from the out-patient departments (OPD). Maximum number of specimens were received from Orthopaedics (99/261) followed by Paediatrics (59/261), General Medicine (45/261) and Cardiology (18/261). Most of the patients comprising the study population, 53% to be precise were in the age group of 0-20 years. (Table 1).

Table 1 Age Distribution of ASO Seroprevalence

Age group (in years)	Number of patients in age group	Number of patients with ASO titer >200 IU/mL
0-20	89	38
21-40	105	23
41-60	59	8
>60	8	2
TOTAL	261	71

DISCUSSION

Streptococcus pyogenes, or group A beta-hemolytic *Streptococcus* (GAS), causes a number of acute, common pyogenic infections, including pharyngitis and skin infections. In addition, the organism is responsible for certain non suppurative diseases, such as acute rheumatic fever and post streptococcal glomerulonephritis, which occur weeks after the acute infectious process⁷. The sequelae are thought to be autoimmune-mediated diseases; that is, the damage is due to the host's immune response. Although the pyogenic infections are best diagnosed by isolation of the organism in culture, the non-suppurative diseases occur at a time when the organism may no longer be present. Thus serologic diagnosis is usually performed⁸. While a number of tests utilize different antigens of GAS, the most frequently performed tests are those that determine the anti-streptolysin O (ASO) titer and the anti-DNase B (ADB) titer^{5,6}.

The ASO antibody test is commonly used to demonstrate serologic response to *S. pyogenes*⁹. Ideally, it is recommended that the titer be determined in the acute phase and then determined in the convalescent phase 14 to 28 days later, with a positive result defined as a rise in titer of twofold or more¹⁰. However, it is not always

practicable to obtain a second sample for titer determination, particularly in developing countries, where acute rheumatic fever is the most common. Therefore, it is generally accepted that if only a single specimen is available, a titer greater than the upper limit of normal at the initial testing can be considered presumptive evidence of a preceding streptococcal infection^{10,11,12}.

Antistreptolysin-O titer has been shown to vary with age, geographical location, season and site of infection. Hence a single specimen when available requires to be compared with a predetermined baseline value or upper limit of normal (ULN) in a particular geographical area¹³. There is now growing evidence and impetus for the notion that single upper-limit-of-normal values for ASO and ADB titers may be able to be applied globally^{1,13}.

Our study revealed a 27% ASO seroprevalence which was slightly higher than the rates mentioned by Sharma et al., 2016 (22.8%) and Chillana et al., 2018 (20.4%) from studies conducted in Northern India^{7,14}. However, our result of highest seroprevalence being observed in the 0-20 years age group was quite similar to findings of earlier studies^{7,14,15}. Thus ASO seroprevalence was found to be highest among children, adolescents and young adults. As this was a retrospective study, correlation with the socioeconomic status, clinical outcome and follow-up of the study population could not be done, which were the limitations of our study.

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