

## PREVALENCE OF ANTI-STREPTOLYSIN O ANTIBODIES AT BANKE REGION NEPAL

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**Objective:** Serum levels of anti-streptolysin O antibodies (ASO) in the routine evaluation of patients with rheumatic conditions. Prevalence of elevated serum ASO titer in patients which were coming in OPD & IPD of Nepalgunj Medical College & teaching hospital with various clinical conditions.

**Method:** This was a retrospective cross sectional study, which was performed in the central laboratory of Microbiology at Nepalgunj Medical College and teaching Hospital, Banke, Nepal during the period of September 2010 to April 2012. The serum samples were tested for Antistreptolysin O (ASO) antibodies by latex agglutination test. **Results:** Total 308 patients including 40.91% male and 50.09% female were tested for ASO serum levels. 140 were positive and 168 were negative. In 140 positive cases 57 were male and 83 were female. In 168 negative cases 69 were male and 99 were female. **Conclusion:** The prevalence of Anti-streptolysin O (ASO) antibody in total cases was 45.45%. In male was 45.24% and in female was 45.60%. The highest percentage was found in age group 0-21 years. The presence of elevated streptococcal antibody titers in such a population, which probably reflects a high background prevalence of streptococcal infections, should be taken into consideration when evaluating the role of the group A streptococcus in non-purulent complications of infections.

**Keywords:** Prevalence, Anti-streptolysin O (ASO), group A Streptococcus (GAS), rheumatic diseases, Banke Region.

### INTRODUCTION

*Streptococcus pyogenes* (Group A Streptococcus/GAS) is one of the most common and ubiquitous human pathogens. It causes a wide array of infections, the most frequent of which are acute pharyngitis ("strep throat") and impetigo (pyoderma). Other manifestations of infection with GAS include sinusitis, otitis, peritonsillar abscess, pneumonia, scarlet fever, erysipelas and cellulitis and the severe soft tissue infections myonecrosis and necrotizing fasciitis<sup>1</sup>. It is also associated with two main non-suppurative sequelae: acute rheumatic fever (ARF) and acute glomerulonephritis (AGN).<sup>2</sup> There are two accepted means of documenting recent throat streptococcal infection: positive culture for group A Streptococcus from the throat or anti-streptococcal antibody tests<sup>3</sup>. Since there are several problems inherent in relying upon a throat culture (in many cases they are spontaneously negative, due to previous antibiotic treatment, or positive due to a carriage state), streptococcal antibody tests have become a method commonly used to provide evidence of preceding

streptococcal infection.<sup>4</sup> Tests that measure antibodies to the extra-cellular products are commercially available and more commonly used. The anti-streptolysin O (ASO) assay was the first such test to be developed and is still widely used. ASO is not only useful in the diagnosis of streptococcal infections or complications, but also in the follow-up process and in evaluating the effectiveness of treatments.<sup>5</sup> It measures the ability of serum to neutralize streptolysin O. The results of conventional assays are reported as Todd units which are the reciprocal of the highest dilution of serum that is positive. Antibodies to deoxyribonuclease B (ADB) are used less commonly and those against hyaluronidase are rarely used.<sup>6</sup> As ASO is not always elevated after streptococcal infection or sequelae, it is necessary to add the alternative serological test. Since ADB has a longer half-life than ASO, it can be a valuable tool in the diagnosis of remote past infections.<sup>7</sup>

### MATERIALS AND METHOD

Serum samples were collected from 308 patients between the periods of September 2010 to April 2012. Samples were collected in clean, sterile, small test tube from suspected streptococcal infections and its sequelae patients attending out-patients and in-patients departments at Nepalgunj College Medical & Teaching Hospital in Banke, Nepal. All the serum samples were tested by

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Rhelax-ASO kit (Tulip Diagnostics P. Ltd. INDIA.). The instructions, reagents and accessories to follow were supplied with the kit.

**Procedure**

This research was approved by the Regional Ethical Review Board by College Medical & Teaching Hospital in Banke, Nepal. All patients included gave their informed consent to participate in this research. Test serum and reagents were kept at room temperature before testing. 40µL of patient’s serum within the circled area were placed on the clean and dry special glass slide provided in the kit. One drop of well mixed ASO latex reagents was added to serum. The reagent and serum using the applicator stick were mixed. The slide was rotated and observed for agglutination macroscopically at two minutes. Results were compared with Positive control and negative control. ASO titre 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**

Total 308 patients were included in this study. From them, 40.91% male and 59.09% female were tested for ASO serum levels (Figure 1), 140 were positive and 168 were negative.

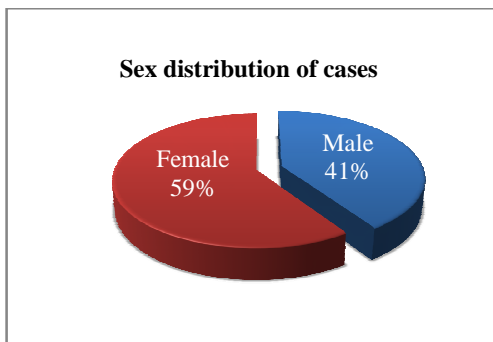


Figure 1  
Sex Distribution

In 140 positive cases 57 were male and 83 were female. In 168 negative cases 69 were male and 99 were female. Highest positive case were found in the age group of 11- 30 (Table 1 and Figure 2). The prevalence of total case was 45.45%. The prevalence of total female was 45.60% and the prevalence of total male was 45.24% (Table 2). The highest prevalence of male found in the age group 0–10 was 66.67 and the highest prevalence of female found in the age group 11 – 20 was 61.70 (Table 3 and Figure 4).

Tabel 1  
Prevalence of ASO According to Age group wise distribution.

Age	ASO		Total	Prevalence rate (%)
	Positive	Negative		
0-10	23	15	38	60.53
11-20	41	30	71	57.75
21-30	40	56	96	41.67
31-40	10	31	41	24.39
41-50	9	15	24	37.50
51-60	9	10	19	47.37
61-70	6	7	13	46.15
70+	2	4	6	33.33
Total	140	168	308	45.45

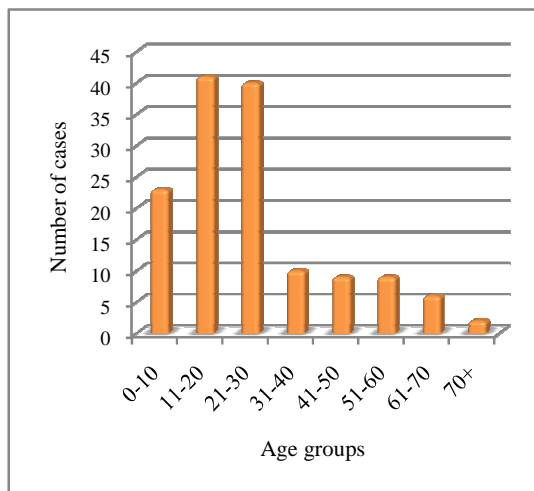


Figure 2  
Age Group Wise Distribution of Total Positive Case

Table 2  
Sex Wise Prevalence of all Cases

Sex	ASO		Total (%)	Prevalence rate (%)
	Positive	Negative		
Male	57	69	126 (41)	45.24
Female	83	99	182 (59)	45.60
Total	140	168	308 (100)	45.45

Table 3  
Prevalence of ASO According to Sex wise Distribution in Different Age Groups

Age	Sex	
	Male	Female
0-10	66.67	52.94
11-20	50.00	61.70
21-30	41.30	42.00
31-40	18.75	28.00
41-50	54.55	23.08
51-60	40.00	50.00
61-70	50.00	45.45
70+	0.00	40.00
Total	45.24	45.60

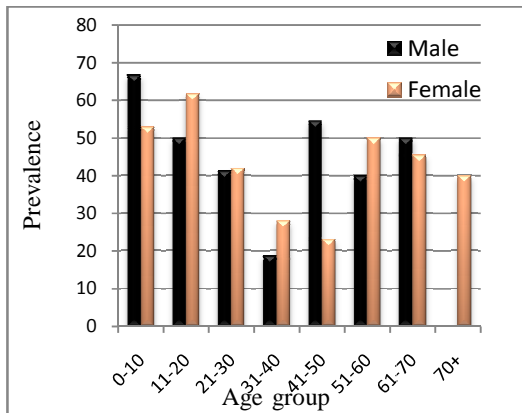


Figure 3  
The Comparative Prevalence Between Male and Female in Different Age Group

## DISCUSSION

The serological test for streptolysin O antibodies (ASO) is commonly used to aid in the diagnosis of post-streptococcal non-suppurative sequelae such as ARF and glomerulonephritis.<sup>8,9</sup> Since streptococcal infections are related to some rheumatic conditions, family physicians and rheumatologists measure ASO titers as a predisposing factor for rheumatic diseases or as an additional acute-phase reactant in order to evaluate the severity and activity of these diseases. Conventional laboratory practice is to measure levels of antibodies to various combinations of the extra-cellular GAS antigens: (ASO, DNase B and streptokinase antibodies. However, Blyth et al.<sup>10</sup> 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.

ASO levels vary with age group of the study population and geographical distribution. In the present study we aimed to analyze the prevalence of ASO in hospitalized and OPD patients in nepalgunj medical college & teaching hospital Banke Nepal.

In our study the highest prevalence of male found in the age group 0-10 was 66.67% and the highest prevalence of female found in the age group 11-20 was 61.70%. The lowest prevalence of male found in the age group 31-40 was 18.75% and the lowest prevalence of female found in the age group 41-50 was 23.08%.

This study, together with data derived from the present study indicates that the levels of the streptococcal antibodies in healthy populations can vary substantially, depending on the frequency of streptococcal infections in those populations.

## CONCLUSION

The prevalence of Anti-streptolysin O (ASO) antibody in total cases was 45.45%. In male

was 45.24% and in female was 45.60%. The highest percentage was found in age group 0-21 years. The presence of elevated streptococcal antibody titers in such a population, which probably reflects a high background prevalence of streptococcal infections, should be taken into consideration when evaluating the role of the group A streptococcus in non-purulent complications of infections.

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