



# PREVALENCE OF SYPHILIS IN EASTERN NEPAL: A RETROSPECTIVE STUDY

Yadav A<sup>1</sup>, Patel AK<sup>2</sup>, Poudyal N<sup>3</sup>, Amatya R<sup>4</sup>, Khanal B<sup>5</sup>

<sup>1</sup>Faculty, Department of Microbiology, National Medical College and Teaching Hospital, Birgunj, Nepal

<sup>2</sup>Faculty, Department of Pathology, National Medical College and Teaching Hospital, Birgunj, Nepal

<sup>3</sup>Associate Research Scientist, International Vaccine Institute, Seoul, Korea

<sup>4</sup>Faculty, Department of Microbiology, Nepal Medical College and Teaching Hospital, Nepal

<sup>5</sup>Faculty, Department of Microbiology, B.P. Koirala Institute of Health Sciences, Dharan, Nepal

**Abstract:** Even today prevalence of syphilis is no doubt very high in underdeveloped countries like Nepal, but there has been scarce of information regarding the exact prevalence of this disease in general population. The objective of this study is to assess the seroprevalence of anti-treponemal antibody among patients visiting tertiary care hospital. A retrospective study was conducted for 9 years (2009 to 2017). Clinical data were collected from the serology section of Department of Microbiology, BPKIHS, Dharan. Of total (9610), 235 (2.4%) tests were reactive for anti-treponemal antibodies. Significant decrease in the prevalence of syphilis is a good indication for an underdeveloped country like Nepal towards achieving millennium development goal. But in the era of HIV/AIDS, there is always a high chance, where syphilis can increase morbidity and mortality, thus authorities should be always vigilant in monitoring and spreading awareness to control spread of syphilis.

**Key Words:** Rapid plasma reagin, Retrospective Study, Syphilis, *Treponema palladium*

## INTRODUCTION

Syphilis is one of the most common sexually transmitted infections (STIs), caused by the bacterium *Treponema pallidum*. It is characterized by a multistage course of disease, in which symptomatic and asymptomatic phases occur<sup>1</sup>. Routes of transmission for syphilis are- sexual intercourse, blood transfusion and vertical transmission<sup>2</sup>. Cases of STIs are less reported, under diagnosed and their sequelae may either come under maternal, child or cancer morbidity and mortality statistics. Therefore, it is difficult to make out the exact existing case of STIs<sup>3</sup>. Globally, Syphilis continues to be a major public health concern and it is estimated that 12 million new infections occur annually with its highest prevalence in South and Southeast Asia<sup>3,4</sup>. Various studies in Nepal (Kathmandu, Pokhara and 22 Terai districts) have concluded that STIs are more prevalent among high risk population and there is a low prevalence in general population<sup>5</sup>.

Reasons associated with risk of STIs are economic deprivation, low education, social disgrace, socioeconomic inequality and economically driven migration and mobility<sup>6,7</sup>.

Most of the data available on STIs are targeted to high risk population as Community Sex Workers (CSWs), intravenous drug abusers, immigrant workers and truck drivers, so a paucity of community based data on STIs was felt. Therefore, we decided to carry out a retrospective study to reveal the prevalence of syphilis among general population.

## METHODS

A retrospective study was conducted over a period of 9 years (2009 to 2017). A total of 9610 clinical data were collected from the record book of serology section, Department of Microbiology, BPKIHS, Dharan. All aged groups including men and women were included in this study. Ethical approval is obtained from Institutional Review Committee Board (IERB), BPKIHS, Dharan.

Three ml of blood was collected aseptically in a biochemistry blood container vial in the collection unit of Central Laboratory Service. For further processing it was transported to the serology unit of department of microbiology. Blood samples were centrifuged at 3000 RPM for three minutes to collect serum. Rapid Plasma Reagin (RPR) reagent was brought to room temperature 30 minutes prior to the test. RPR 18 mm card circle was taken. 50  $\mu$ l of RPR reagent was aspirated with the help of pipette and kept on a RPR card, 50  $\mu$ l of serum was added and was mixed with plastic stick. RPR card was kept on a rotator for 8 minutes. At the end of 8 minutes presence of floccules was recorded in light. Titer suggestive of  $\geq 1:8$  was reported as reactive for anti-treponemal antibodies. Titer less than 8 may be in cases like pregnancy, malaria, leprosy, lymphoma, tuberculosis, endocarditis, measles, hepatitis and autoimmune diseases<sup>8,9</sup>.

Data was entered in MS-Excel and converted into SPSS version for statistical analysis.

## RESULTS

### Prevalence of syphilis:

Total samples	9610
Mean age	26.5
Std. Deviation	8.022
Minimum age	1 Yr
Maximum age	87 Yr
Percentiles	
25	22
50	25
75	30

Table 1: Prevalence of Syphilis (n=9610)

A total of 9610 tests were performed over a period of 9 years. Both sexes are included. Mean age of patient was found to be 26.65 years (SD 8.02) (Table 1). Minimum age was 1 year and maximum of 87 year was included in this study. Of the total (9610), 235 (2.4%) tests were reactive for anti-treponemal antibodies. Out of all reactive cases, 125 were male and 110 were female, with positivity rate being 1.3% and 1.14% respectively (Figure 1). Majority of the positive cases belonged to the age group 20-40 years. None of the samples were excluded in this study.

### RPR prevalence gender wise:

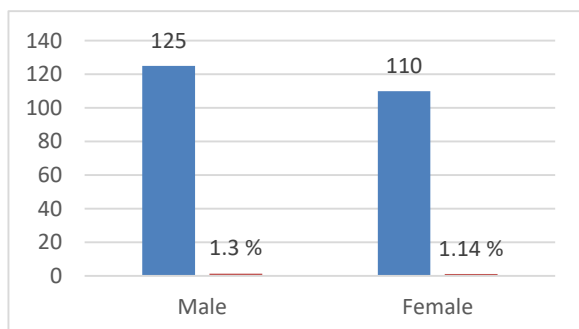


Figure 1: RPR prevalence gender wise (n=235)

Figure 1 illustrates that, out of 9610 samples, 235 were reactive for RPR. Among 235, male reactive for RPR was 125 (1.3%) and female 110 (1.14%). The number of male populations was found to be more compare to female.

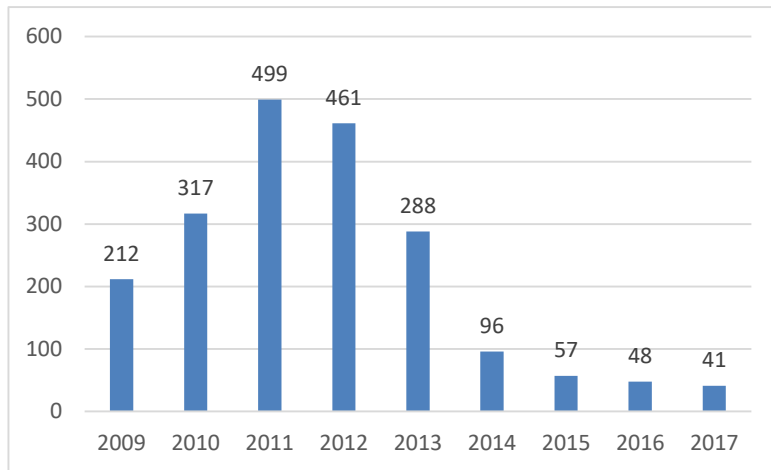
**RPR prevalence year wise (n=9610):**

Figure 2: RPR prevalence year wise (n=9610)

The yearly prevalence was 212(2.2%)(2009), 317,3.3%(2010), 5.2%(2011), 4.8%(2012), 3.0%(2013), 1.0%(2014), 0.6%(2015), 0.5%(2016) and 0.4%(2017).

## DISCUSSION

Syphilis is caused by a bacteria *Treponema palladium*. It is an obligate human pathogen renowned for its invasiveness and immune-evasiveness<sup>10,11</sup>; clinical manifestations result from the local inflammatory response elicited by spirochetes replicating within tissues<sup>12-14</sup>. Statistically significant result was observed in this retrospective study. Over a period of 9 years (2009 to 2017), the prevalence for syphilis in patients attending tertiary care center BPKIHS, Dharan was found to be 2.4%. Similar study conducted among the patients attending VCT in Dhulikhel Hospital, Nepal, where the prevalence of STIs was found to be 108 out of 145 (74.5%)<sup>3</sup>. The number of male was found to be more in comparison to female, as at that time male used to apply for VISA, and RPR was one of the mandatory tests to apply for abroad but the number of female was less in VISA process, it is also that fewer women visited the clinic than men. It may be due to disgrace and shame and unwillingness to mention their problems regarding STIs. Studies conducted in various parts of South East Asia have shown almost double prevalence of STIs among women<sup>15-17</sup>. It is also due to lack of knowledge about screening of RPR test in antenatal checkup so the number of female was found to be less visiting STIs clinic. The prevalence was found to be increasing from 2009 to 2011 but from then it was found to be decreasing. This may be due to awareness in the people and also test for syphilis (RPR) is included as a screening test in antenatal checkup. World Health Organization's recommendations of initiation of ANC within the first four months of pregnancy and at least four ANC visits during the course of an uncomplicated pregnancy<sup>18</sup>. But the recommended number of visits is not always met in Nepal where more than a quarter (26%) of Nepalese women reported no ANC visits and only 29% reported four or more ANC visits<sup>19</sup>. RPR test is also done as a screening test in Blood donors and person applying VISA for different countries.

Nowadays people are aware about their health but this awareness is limited to person who is living in sophisticated area but what about to those who are living in village. They don't have any idea about syphilis and how it is transmitted so it is the job of the government to make village people aware about syphilis. Even today the prevalence of syphilis is no doubt very high in developing countries like Nepal and also there is scarce of information about the prevalence of syphilis in general population.

## CONCLUSION

This study has shown that there is significant decrease in the prevalence of syphilis as the year progress. This is a good indication for a developing country like Nepal. But in the era of HIV/AIDS, there is always a high chance, where syphilis can increase the morbidity and mortality. Thus, authorities should be always vigilant in monitoring and spreading awareness to control spread of this disease.

## Conflict of interest

We declare that we have no conflict of interest.

## Acknowledgement

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