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TRENDS OF SEROPREVALENCE OF SYPHILIS IN A TERTIARY-CARE HOSPITAL IN MEGHALAYA, INDIA - A RETROSPECTIVE STUDY

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ABSTRACT

Introduction: Syphilis, caused by *Treponema pallidum*, is a significant global health issue with over one million daily cases and six million new cases diagnosed annually. It is a chronic illness with potential co-infections with HIV and hepatitis. Serological screening is crucial to prevent transfusion-transmitted illnesses. Although syphilis prevalence and clinical patterns are improving in India, it remains a serious public health issue with regional differences.

Aim: To find out how common syphilis is among the patients at Civil Hospital, Shillong. A retrospective study.

Materials and Methods: All of the syphilis cases that were reported to the Laboratory Medicine department at Civil Hospital Shillong between January 1, 2019 and December 31, 2022. Based on clinical or Serological evidence, syphilis was identified. Statistical analysis was performed using R-software to assess the data. The significance value was set at 0.05, and any result that was less than or equal to 0.05 was considered statistically significant.

Result: 645 samples in all were examined during the investigation. Total syphilis antibody sero-prevalence was 47 (7.25%) between 2019 and 2022.

Conclusion: The recent study demonstrated that syphilis seroprevalence among persons in this

area is constant, but it is still encouraged that people get tested for the disease since it is recoverable and will help to lessen the symptoms of tertiary syphilis that cannot be treated.

Keywords: Syphilis, *Treponema pallidum*, Sexually Transmitted Infections, Seroprevalence, RPR

INTRODUCTION

The STI known as syphilis is brought on by the bacteria *Treponema pallidum*. Many nations around the world, notably developing nations, have major health concerns about it **[1-3]**. The World Health Organisation (WHO) estimates that over one million people worldwide contract one or more STDs every day **[4]**. Syphilis has a significant risk of mortality in foetuses and newborns, and six million new cases are reported each year in adults between the ages of 15 and 49 worldwide **[5]**. In addition to its direct morbidity, it raises the likelihood that both HIV and hepatitis will co-infect a person. Furthermore, children born to infected mothers may develop syphilis during their lifetime. In addition, syphilis is a chronic illness that, if left untreated, progresses over time through a variety of clinical stages and may result in neurological and cardiovascular problems that are irreversible **[4-9]**. Congenitally, despite the fact that refrigerated blood components are less infectious for syphilis, transmissions through blood components still happen. *Treponema pallidum* spirochetes are spread through sexual contact. In order to prevent transfusion-transmitted illnesses **[6-9]**, Serological screening for syphilis and other infectious disorders is a crucial blood safety strategy. Unsuitable transfusions of blood are extremely expensive in an economic and human perspective, not just for the patients themselves but also for those closest to them **[8]**.

A few researches in India have suggested that syphilis is becoming more common **[10-11]**. Syphilis prevalence and clinical patterns are improving in India as a result of improved access to laboratory testing and treatment as well as greater public knowledge of health issues, but it is still a serious public health issue with wide regional differences. As a result of widespread antibiotic usage and silent bacterial infections, the prevalence of bacterial STIs is declining while that of viral STIs is rising **[12-14]**. Numerous inflammatory and infectious conditions have the ability to exhibit clinical and serological features that match those of syphilis, thus it is important to pay attention to the biological false positive (BFP) phenomenon. Mixed infections are not uncommon, and human immunodeficiency virus (HIV) infection alters the clinical signs and development of syphilis **[15]**. As a

result, we conducted study to assess the disease's current state and pinpoint any changes in its epidemiological and clinical patterns over the previous four years.

MATERIAL AND METHODS

The data records of patients covering the time frame of January 2019 to December 2022 were subjected to a retrospective analysis. The data was collected from the department of Laboratory Medicine, Civil Hospital, Shillong.

For the study, blood samples were collected from patients attending different units of the hospital. Using accepted procedures, all serum samples were first examined qualitatively for Rapid Plasma Reagin (RPR), and the reactive samples were then tested quantitatively for RPR. Samples that tested positive to a qualitative and quantitative RPR test were regarded as having the syphilis bacteria.

ETHICAL CLEARANCE

Due to its retrospective nature, ethical clearance was not required for this study. However, permission was obtained from the Joint Director of Health Services (SS) Civil Hospital, Shillong vide letter no. CHS/GEN/2023/4179 dated Shillong the 21st June, 2023 for accessing laboratory logbook.

STATISTICAL ANALYSIS

R-software was used for statistical analysis to assess the data. The significance of this study was assessed using a chi-square test, confidence intervals were generated, and the p-value was computed. The significance value was set at 0.05, and any result that was less than or equal to 0.05 was considered statistically significant.

RESULTS

During the course of the investigation, 645 samples were analyzed. Between 2019 and 2022, there was 47 (7.25%) total sero-prevalence of syphilis antibodies **(Table 1)**. Syphilis reactive cases accounted for 1(1.69%) of all cases in 2019. In 2020, 2 reactive cases (13.33%) of instances. Reactive cases of syphilis reached 8 (8.79%) in 2021 and 36 cases (7.45%) in 2022 **(Figure 1 and 2)**.

In 2019, there were a total of 1 (3.13%) reactive male case. Reactive cases for males were 2 (28.57%) in 2020, while there were none for females. The number of reactive cases for syphilis rose to 21 (7.98%) for men and 15 (6.82%) for females in 2022. In 2021, the reactive cases for males were seen to climb to 6 (11.54%) and 2 (5.13%), respectively **(Table 2)**.

There were 31 (65.96%) male and 16 (34.04%) female syphilis positive individuals in total. The majority of them were in the 16 to 50 age range, or 40 (85.09%). **Table 3** displays the distribution of cases by age and sex.

Table 1: Positivity rates of syphilis over the years

Year	N	Result (Reactive+)	%
2019	59	1	1.69%
2020	15	2	13.33%
2021	91	8	8.79%
2022	483	36	7.45%
Total	648	47	7.25%

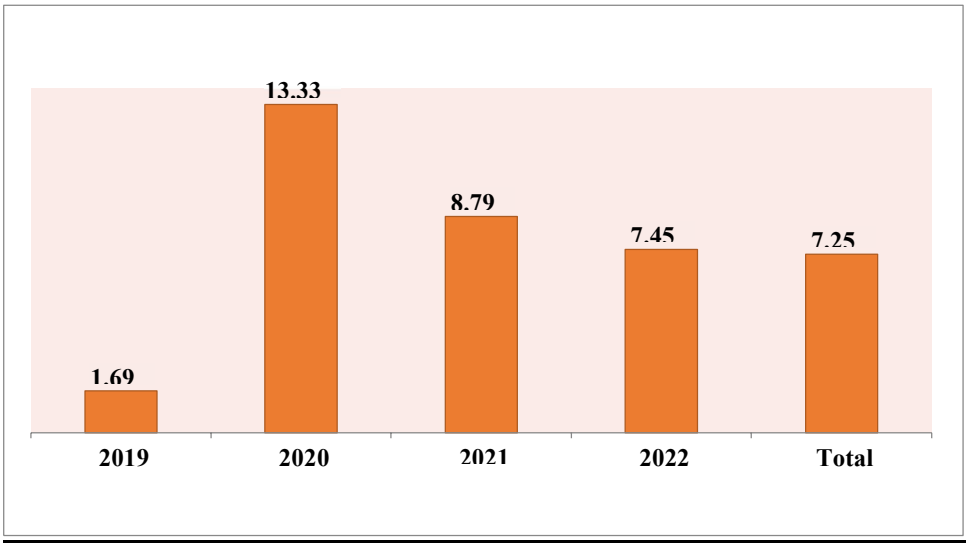

Figure 1: Positive Reactivity of Patients

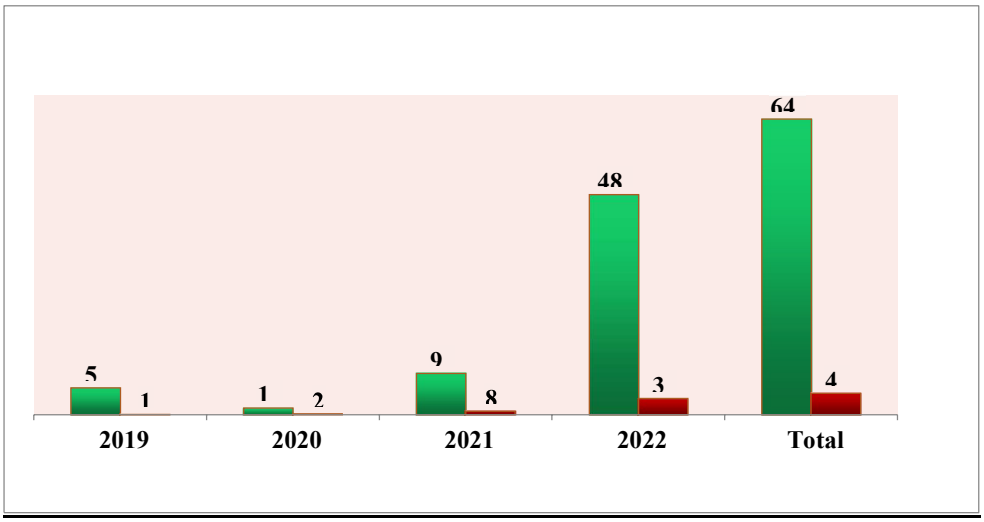

Figure 2: Comparison between Non-reactive (green) and Reactive Samples (red)

Table 2: Gender-wise distribution of reactive and non-reactive rates over the years

Year	Reactive or Non-reactive	N			%	
		Males	Females	Total	Males	Females
2019	Reactive	1	0	1	3.13%	0.00%
	Non-reactive	31	27	58	96.88%	100.00%
	Total	32	27	59	100.00%	100.00%
2020	Reactive	2	0	2	28.57%	0.00%
	Non-reactive	5	8	13	71.43%	100.00%
	Total	7	8	15	100.00%	100.00%
2021	Reactive	6	2	8	11.54%	5.13%
	Non-reactive	46	37	83	88.46%	94.87%
	Total	52	39	91	100.00%	100.00%
2022	Reactive	21	15	36	7.98%	6.82%
	Non-reactive	242	205	447	92.02%	93.18%
	Total	263	220	483	100.00%	100.00%

Table 3: Age and Sex distribution Among Syphilis positive patients (N=47)

Age group	Male	Female	Total
<15	2(4.25%)	1(2.12%)	3(6.37%)
16-50	26(55.31%)	14(29.78%)	40(85.09%)
>50	3(6.38%)	1(2.12%)	4(8.50%)
Total (N=47)	31(65.96 %)	16(34.04%)	47(100%)

DISCUSSION

Transfusions of blood, direct sexual contact, and mother-to-child transmission are all ways that syphilis can spread. However, due to sensitive detection tools that are now available and frequent testing of blood products for syphilis, blood transfusions today only play a minimal role.

Syphilis testing is required before all routine blood transfusions. Over the past ten years, syphilis has returned as a health issue in a number of affluent countries **[16]**.

Depending on the demographic studied, various studies from India have revealed varying prevalence of syphilis. Seroprevalence studies from STI clinics have revealed a range of 5.4% to 8.2% **[17-18]**. The sero-positivity rate for syphilis was 7.25%, according to our study. These results could be viewed as signs that health care sector should provide more effective STI prevention and management initiatives and the availability of care in hospitals and clinic.

Several studies have revealed an increase in syphilis prevalence in India in recent years **[10]** in contrast to earlier studies when the prevalence rate remained constant over time **[20-21]** which may be the case in this study as well. Several other research from India and overseas have revealed a male predominance **[20, 23, 24]**, which is also seen in our study.

The recent addition of VDRL testing to serological screening before blood donation and surgical treatments helped detect people in the latent stage, making it one of the causes of the rise in the frequency of such cases. Another factor contributing to the increase of latent syphilis could be the improper or ineffective treatment of secondary syphilis **[20, 25]**.

In the 645-person study's overall population, 7.25% including both male and female patients tested positive for syphilis. Patients under the age of 15 made up 6.37% of the patient population, patients between the ages of 16 and 50 made up 85.09% of the patient population, and those above 50 were found to be positive at 8.50%. Gender-wise distribution showed that 34.04% of women and 65.96% of men had syphilis, respectively. These findings indicate that people between the ages of 16 and 50 are more likely to contract syphilis.

It will need further research to confirm the correlation between syphilis and the different outcomes seen in this study and to track the reappearance of this historic infection in our nation. Any STI carries a

high risk of morbidity, and because it affects the young, productive population, it has enormous economic ramifications **[10-28]**. Therefore, screening for STIs should be made mandatory as majority of patients showed little to no symptoms or are asymptomatic.

CONCLUSION

Significant chronicity and quiet latency are characteristics of syphilis, which affect obstetric outcomes and cause a number of systemic problems. The STI control programmes in our country, which has a sizable population, need to be improved significantly, with a focus on syphilis screening in particular.

The current study reveals that syphilis seroprevalence among individuals in this location is constant; nonetheless, it is still advised for people to be screened for the infection because it is curable and will assist to reduce the negative effects of untreated Syphilis. To prevent the negative effects that could arise from a missed diagnosis or incorrect treatment, public health activities are urgently needed in India to raise awareness of syphilis among clinicians and people at risk.

By modifying behaviour, promoting safe sexual practices, improving case diagnosis, treatment, and follow-up, it may be possible to lower the prevalence of syphilis. A lengthy investigation of a sizable population would reflect the evolving epidemiological trends and impact of syphilis because this study was hospital-based and may not accurately reflect the true prevalence.

FINANCIAL SUPPORT

Nil

CONFLICTS OF INTEREST

None

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