

Seroprevalence of Syphilis among Patients Attending Antenatal Care & Sexually Transmitted Disease (STD) Clinics in a Tertiary Care Hospital of Northern India

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Abstract: **Background:** -Syphilis is a sexually transmitted disease (STD) transmitted primarily through sexual intercourse, can also be transmitted in utero, the other less common modes being blood transfusion and contaminated needles among intravenous drug users. It is characterized by episodes of active disease, interrupted by latency. Congenital syphilis poses a significant challenge especially because infants may be still born, asymptomatic or present with a variable clinical picture at birth. Syphilis has been implicated in increasing susceptibility to HIV infection as well. We undertook this study to determine the seroprevalence of syphilis in pregnant women attending ANC and patients attending STD clinic in a tertiary care hospital of Northern India. **Material & Method:** - Of the total 10100 samples received during 1.5 years (1st January 2014 to 30th June 2015), VDRL was performed on 10100 samples. Results: 63 (0.62 %) were found to be positive by VDRL. The patient's positive for syphilis included 42 pregnant females (0.88% of the females from ANC clinic), 21 were from STD clinic (3.8% of the samples received from STD clinic). **Conclusions:** -Although the seroprevalence is low in ANC clinic, the higher syphilis seroprevalence in STD clinic in this study suggests that acceleration of direct linkages between STI testing and counselling will be useful in enhancing the control of STI in India.

Keywords: Syphilis, VDRL, TPHA, ANC, STI, STD

1. Introduction

Sexually transmitted infections (STIs) are some of the most common causes of illness worldwide. STIs constitute a major public health problem for both developing and developed countries. The emergence of HIV infection has increased the importance of measures aimed at control of STIs. A proper understanding of the patterns of STIs prevailing in different geographic regions of a country is necessary for proper planning and implementation of STD control strategies. Incidence of STIs, in the world, is rising despite improved methods of diagnosis and treatment [1]. World over, excluding HIV, there are 333 million new cases of STIs per year. Sexually transmitted infections are far more common in developing countries than industrial countries [2]. Syphilis is a chronic systemic infection caused by the spirochete, "*Treponema pallidum*". Generally considered to be a sexually transmitted disease, this infection can also be transmitted in utero, and rarely by blood transfusion or non-sexual contact [3] and is characterized by episodes of active disease, interrupted by latency. Comprehensive data on the prevalence of syphilis is not available in most of the developing countries. There is high variability in the seroprevalence rates among different socioeconomic groups in these countries [4, 5]. Seroprevalence rates in India range from 9.07% among high risk STI patients in a study from Himachal Pradesh to 21.9% in long distance truck drivers in central India [6] and as low as 1.9% among ANC attendees in a study by WHO [7]. Congenital syphilis poses a significant challenge especially because infants may be still born, asymptomatic at birth but nonetheless infected, or present with a highly variable clinical picture, thereby precluding easy clinical

diagnosis. The high risk of congenital syphilis in untreated or inadequately treated mothers (4%) is one reason why 40 % of these pregnancies end in fetal loss or perinatal death [8]. The most widely used screening tests for syphilis are the Venereal Disease Research Laboratories (VDRL) and the rapid plasma reagin (RPR) tests. Two categories of serological tests for the diagnosis of syphilis are currently available: cardiolipin tests like the Venereal Disease Research Laboratory (VDRL) test and specific tests like the *Treponema pallidum* hemagglutination assay (TPHA). The World Health Organization recommends the use of a combination of a non-treponemal test and a treponemal test for screening and diagnostic purposes. [9]

2. Material and Methods

A retrospective study was conducted over a period of 1.5 years in the Department of Microbiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi. The study included 10100 samples received during January 2014 to June 2015 of which 4773 pregnant females were from ANC clinic. VDRL was performed on 10100 samples and TPHA on 63 samples to confirm the positive VDRL results. It was positive in all the reactive samples. VDRL: Qualitative and quantitative VDRL tests were carried out on all sera using VDRL antigen prepared by the Institute of Serology, Kolkata. Sera showing no clump were reported as non-reactive. Samples showing small clumps were considered weakly reactive. Those with medium sized or large clumps were reported as reactive. Quantitative test was performed on all reactive sera including those showing a weak reaction. The results were reported in terms of the highest dilution which gave a frank positive reaction. TPHA

was performed by TPHA kit as per manufacturer's instructions.

3. Results

Out of 10100 samples on which VDRL was performed 63 (0.63%) were found to be positive. These were further confirmed by TPHA. A total agreement was seen between TPHA and VDRL with a titre of 1 in 16 and above. Among VDRL reactive patients, 18(28.6%) were males and 45(71.4%) females. Age wise distribution was no patient (0%) in age group ≤15 years, 57 (90.5%) in 16-30 years, 6(9.5%) in age group 31- 45years, none (0%) in ≥45years. The patients positive for syphilis included 42 pregnant females (0.87% of the ANC samples received) and 21 patients from STD clinic (3.8% of the samples received from STD clinic).

4. Discussion

Comprehensive data on the incidence of syphilis is lacking from most developing countries. Serological surveys are the best source of information on the prevalence. Minimal estimates of yearly incidence of syphilis are 12 million worldwide [10]. Estimates reveal that South Asia has the highest number of syphilis cases in the world [7]. Most of the international studies on seroprevalence of syphilis range between 6-23%. Accurate figures on the incidence of STDs are difficult to obtain because of inadequate reporting and the secrecy that surrounds them. All available data, however indicate a high prevalence of STD (from 1% -14%) in the vulnerable population groups [11]. Comparing international studies with our study on seroprevalence of syphilis in ANC and STD clinic, our results are quite low. TPHA is a useful test in confirming true positive syphilis cases. Prevalence was found to be higher in women than in men (table-1).

Table 1: Sex wise distribution of Syphilis Patients

Males	18(28.6%)
Females	45(71.4%)

Table 2: Age wise distribution of Syphilis Patients

Age Group (yrs.)	No. of Patients	Percentage of Patients
≤ 15	NIL	0%
16-30	57	90.5
31-45	6	9.5
≥45	NIL	0%

Table 3: Clinical presentation of Syphilis Patients

Types of patient	Percentage
ANC(pregnant women)	0.87
STD	3.8

Prevalence was also highest among the age group 16-30years, which could be due to increased risk of exposure in this group and most of pregnant females which constituted a large section of study group also fall in this category (table-2). In India the prevalence of syphilis ranges between 2.0-4.8 % among women of reproductive age [12, 13, 14, 15]. The 0.87% seroprevalence rate for syphilis among ANC attendees in our study is quite low as compared to other studies [7]. This low seroprevalence of syphilis may be due to over-the-counter use of antibiotics for minor complaints

and the easy availability of antibiotics in the country. The study was hospital based and not population based. Gestational syphilis is of particular concern in under equipped health systems and wherever access to health care is a major limiting factor for any STD programme effectiveness. Among the STD clinic attendees, seroprevalence of syphilis was found to be 3.8%. The heterogeneous nature of STI epidemic in India explains the differences in findings at different Geographical location. Programmatic prevention and treatment programs need to be started which take care the local conditions. There are Evidences that STIs may facilitate HIV infection, so need focused attention to the situation. The reason for enhanced susceptibility to HIV among individuals infected with syphilis is due to break down in mucosal integrity causing ulceration, which provides a portal of entry for the HIV virus. Syphilis may also increase HIV infectiousness and transmission among HIV sero-positive individuals dually infected with syphilis by increasing the amount of HIV viral shedding [16, 17, 18, and 19].

5. Conclusions

Population based data on prevalence of syphilis infection are very few. Although the low sero prevalence of syphilis among pregnant women and adult general population is encouraging. There is need of continuous dedicated programs for STI control and Public health interventions to promote awareness of syphilis to avoid the adverse consequences which could result if it is not diagnosed or improperly treated. In addition to contributing to the spread of HIV in India, untreated syphilis could also contribute to poor health outcomes resulting from the consequences of latent stages and congenital syphilis. Similar studies are required from all over India to understand the current status of syphilis infection in the Indian population and thus assessing the impact of STI prevention programs in our country.

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