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SYPHILIS TESTING BY VDRL AND ITS PREVALANCE IN A TERTIARY CARE HOSPITAL: CCM MEDICAL COLLEGE, DURG

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ABSTRACT

Introduction: *In India prevalence of syphilis has been increasing because of lack of health awareness attached to sexually transmitted disease (STDs), poor attendance at STD clinics and syndromic management which misses asymptomatic cases. The diagnosis of this infection is difficult due to inability of this organism to culture it in vitro and limited availability of nucleic acid amplification technique. However, direct visualization of the organism in the presence of lesions and either with facilities of fluorescent and dark field microscopy. Thus, the mainstay of syphilis diagnosis is serology or serodiagnosis. Commercially available treponemal tests can be performed at the point of care. The advantages of rapid tests include their cost and minimal equipment requirement and availability of results within 5-20 minutes.* ***Materials and Methods:*** *In this cross-sectional study samples were collected from the patients who were high risk for the syphilis, with clinical diagnosis of syphilis, pregnant women, patients with HIV (Human Immunodeficiency Virus) positive and drug addicts over a period of 1 year from January 2017 to December 2017. This study was carried out in the department of microbiology at CCM medical college and hospital; kachandur Durg. The test were done using ultra sensitive one step anti-syphilis strip test which is a rapid and immunochromatographic procedure for qualitative detection of Treponemal antibodies generated against Treponema pallidum antigens in human serum /plasma.* ***Result:*** *Out of 4108 samples 905 sample were processed in the department of microbiology which were classified in three group as ANC (784), HIV(68), High risk(53) & in Blood bank 3203 samples were processed for screening of syphilis. Among 784 ANC cases 10(1.28%) were positive, HIV cases 4(5.88%) were positive, in high risk group 4(7.55%) were positive where as in Blood donor 36(1.12%) were positive. The chi-square statistic is 27.7143. The p-value is < 0.00001. The result is significant at p < 0.05. Proportion of cases of ANC, HIV, High risk & Blood donor differs significantly.* ***Conclusion:*** *Our study showed prevalence of syphilis in various groups. Illiteracy and unsafe sexual practices are the major cause of syphilis so; regular educational and training programs should be implemented at community level.*

KEYWORDS: VDRL, Seroprevalence, Syphilis, *Treponema pallidum,* ANC, HIV.

INTRODUCTION

Syphilis is defined as a sexually transmitted infectious disease which is caused by *Treponema pallidum*. In India prevalence of syphilis has been increasing because of lack of health awareness attached to sexually transmitted disease (STD), poor attendance at STD clinics and syndromic management which misses asymptomatic cases.[1,2] Increase in the prevalence of syphilis has been observed in the United States of America (USA), United Kingdom (UK), and also in India.[3,4,5]

Syphilis is a spirochaetal chronic infectious disease caused by the, *Treponema pallidum*. Syphilis can be classified as: primary, secondary, early latent, late latent and tertiary syphilis, on the basis of its infectivity, clinical presentation and progression. Primary is generally characterized by painless genital ulcer. About one third of untreated primary cases will progress to secondary syphilis. 50% of untreated secondary cases will progress to latent infection and serological test for syphilis (STS) is the only test carried out as this phase is asymptomatic. One third of untreated cases of latent syphilis will progress to tertiary syphilis which involves the cardiovascular and/or neurological systems.[6] Syphilis is generally transmitted by sexual intercourse; vertical transmission i.e. from mother to infant, blood donation etc and endemic syphilis is transmitted by non-sexual contact in communities living under poor hygienic conditions and may be transmitted to health care workers.

The diagnosis of this infection is difficult due to inability of this organism to culture it in vitro and limited availability of nucleic acid amplification technique. However, direct visualization of the organism in the presence of lesions either with fluorescent and/or dark field microscopy. Thus, the mainstay of syphilis diagnosis is serology or serodiagnosis.[7]

Commercially available Treponemal tests can be performed at the point of care. These are agglutinations tests like latex particles coated with treponemal antigen or immunochromatographic strips on which a positive reaction appears as a colored line, and can be performed with whole blood, serum or plasma. Rapid tests are highly sensitive and specific.[8] The advantages of rapid tests include their cost and minimal equipment requirement and availability of results within 5-20 minutes, and the disadvantage is that rapid tests cannot differentiate between active and treated syphilis. False positive reaction may occur and needs confirmation with more specific test to determine the disease.[9]

Seroprevalence data in India is very small and the incidence rates ranging from 5.4 /100 persons each year in a sexually transmitted infection clinic to prevalence of 21.9% in samples of long distance truck drivers.[10,11] In developing countries like India, pregnancy screening of symptomatic and asymptomatic syphilis is done by VDRL test, followed by recommendation for confirmation treponemal test for all suspected pregnant ladies. Perinatal mortality is an important cause due to STD infection. Perinatal mortality can be prevented and reduced by timely detection and treatment of syphilis. In secondary and early latent syphilis, sensitivity of VDRL is high while in healthy person specificity is high as compare to ill persons.[12] This study was done to find out the Seroprevalence of syphilis in pregnant ladies attending inward/out patients departments (OPDs), at CCMMC, Kachandur; Durg, by routine VDRL test.

MATERIALS AND METHODS

In this cross-sectional study, samples were collected from the patients who were high risk for the syphilis, with clinical diagnosis of syphilis, pregnant women, and patients with HIV (Human Immunodeficiency Virus) positive, drug addicts over a period of 1 year from January 2017 to December 2017. Data was collected from the medical records. Patients were classified into various groups on the basis of their clinical diagnosis and data available in the laboratory and medical records.

This study was carried out in the department of microbiology at CCM medical college and hospital; kachandur Durg. The test were done using ultra sensitive one step anti-syphilis strip test which is a rapid and immunochromatographic procedure for qualitative detection of Treponemal antibodies generated against *Treponema Pallidum* antigens in human serum /plasma.[13]

High risk group included were cases having multiple sexual partner, intravenous drug users. Antenatal testing of syphilis in pregnant women was done on their first visit. All HIV positive cases were also screened for the syphilis by VDRL test. In Blood bank all blood was tested for syphilis as a routine screening test.

A total of 4108 samples were processed for screening of syphilis. Only after the post counseling of the patients their serostatus reports were given; where by importance of behavioral changes and preventive measures were emphasized. Patient information obtained during the study was kept confidential.

Written inform consent taken from all the patients who were included in the study. Data entry was done in the Windows Microsoft Excel 2013 version, and statistical analysis was done by applying the Chi-square test using SPSS version 17.0.

RESULT

Out of 4108 samples 905 sample were processed in the department of microbiology which were classified in three group as ANC (784), HIV(68), High risk(53) & in Blood bank 3203 samples were processed for screening of syphilis. Among 784 ANC cases 10(1.28%) were positive, HIV cases 4(5.88%) were positive, in high risk group 4(7.55%) were positive where as in Blood donor 36(1.12%) were positive.

Table 1: Seroprevalence of syphilis in various groups.

	TOTAL	POSITIVE	%
ANC	784	10	1.28
HIV	68	4	5.88
HIGH RISK	53	4	7.55
BLOOD DONOR	3203	36	1.12
TOTAL	4108	54	1.31

Table 2: Chi square test.

	Results		
	POSITIVE	**NEGATIVE**	***Row Totals***
ANC	10 (10.31) [0.01]	774 (773.69) [0.00]	784
HIV	4 (0.89) [10.79]	64 (67.11) [0.14]	68
HIGH RISK	4 (0.70) [15.66]	49 (52.30) [0.21]	53
BLOOD DONOR	36 (42.10) [0.88]	3167 (3160.90) [0.01]	3203
Column Totals	54	4054	**4108 (Grand Total)**

(ANC – Antenatal case, HIV- Human Immunodeficiency Virus).

The chi-square statistic is 27.7143. The p-value is < 0.00001. The result is significant at $p < 0.05$. Proportion of cases of ANC, HIV, High risk & Blood donor differs significantly.

DISCUSSION

Venereal diseases research laboratory (VDRL) and rapid plasma reagin (RPR) are Non-treponemal serological tests which are based on reactivity, both IgM (also known as reagin) and IgG antibodies and do not detect specific anti-treponemal antibodies.

A non-specific cardiolipin-cholesterol lecithin antigen is used to detect these antibodies also these tests can be used for monitoring treatment efficacy.[14]

Diagnosis of infectious syphilis made at genitourinary medicine clinics in UK increased by 61% over the decade 2003-2012.[15] Various studies in STD clinic in North India shows a significant rise in the prevalence of syphilis ranging from 15.8% in 1990 to 24.2% 2004. This may be due to rise in the HIV cases or may be due to various socioeconomic causes and behavioral changes.[5,16] Syphilis prevalence reported for sex workers and men who have sex with men (MSM) using data reported through the Global AIDS Response Progress Reporting system was 0.8% in India.[17]

In a Cross Sectional population based serological study, out of the 256 samples, 05 (1.9%) were positive for active syphilis in which majority were uneducated and belonged to low socioeconomic group also had previous congenital anomaly.[18]

The present study was carried out to look for the seroprevalence of syphilis in patients attending a tertiary care centre. Studies from India have shown the various rates ranging from 5.4% to 8.2%.[11,19]

In a cross-sectional study conducted at three government maternity hospitals in Kabul, Afghanistan by Todd S et al Among 4452 women, prevalence of syphilis was zero.[20] In 2008 about 1.36 million ANC globally were estimated to have probable active syphilis, of these, 80% had attended antenatal clinics.[21] The prevalence of confirmed syphilis was less than one percent in a screening in Pakistan.[22]

In the present study, we observed prevalence of syphilis in different groups of patients at our center. The total seroprevalence was 1.28% in ANC group, in HIV group it was 5.88%, in high risk group it was 7.55% whereas in Blood donor it was 1.12%, so out of 4108 patients 54 were seropositive by VDRL (1.31%). A study by Sethi S. et al[2] trends of syphilis in a tertiary care centre in north India was from 0.95% to 1.79% over 6 years with the highest seroprevalence in 2011. In the same study seroprevalence of syphilis among pregnant women was 0.8% during 2006-2011 which was less than seroprevalence of syphilis in ANC in our study (1.28%), which is less than that in Africa (2.13%), higher as compared the situation in the Americas (0.84%), Europe (0.16%) and the Pacific (0.33%).[21] The seroprevalence in HIV was quite higher (5.88%) in our study.

The rise in the seroprevalence has been shown to be increased in men who have sex with men (MSM) and reduction in safe sex practices among them. Whereas in Europe, the rise is due to increased number of MSM as well as increased testing in high-risk groups.[23,24] Secondary syphilis has been reported in studies from India by Ray *et al.*[5] In a study by Singh B et al.[25] seroprevalence of VDRL in replacement donors was 2.6% which was higher than our study. Leibovici_Vera et al[26] in their study showed prevalence of syphilis was 47: 100,000, while a higher prevalence was found among immigrants from Africa, Eastern Europe, and South America. In our study Seroprevalence in Blood donor was (1.12%).

In a study by Ebenezer et al[27] among 51, 164 pregnant women who underwent VDRL testing seropositivity rate was 0.7%, which was lower than our study.

In a study by Silvio Tafuri et al[28] seroprevalence in refugees in Italy was found to be 1.5% which was similar with our study. In a study by Mutagoma et al[29] syphilis prevalence among HIV-infected people was six times higher as compared to HIV-negative people, this prevalence was higher in the 25–49-year-old age.

However, these variable groups should be investigated in studies; their risk factors and includes a greater number of participants. The associations found indicate need for education and regular screening.

CONCLUSION

Our study showed prevalence of syphilis in various groups. More studies are to be carried out in the area to find out the prevalence of syphilis so that proper management can be carried out to decrease the prevalence. Also illiteracy and unsafe sexual practices are the major cause of syphilis so; regular educational and training programs should be implemented at community level.

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