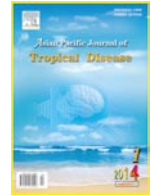


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Seroprevalence of syphilis in a tertiary care hospital

Kawal Preet Kaur^{*1}, Bharti Arora¹, Bhawna Sethi², Jarmanjeet Singh³¹Department of Microbiology, Maharaja Agrasen Medical College, Agroha, Hisar, Haryana 125047, India²Department of Pathology, Shri Guru Ram Rai Institute of Medical & Health Sciences, Dehradun, Uttarakhand, India³Maharaja Agrasen Medical College, Agroha, Hisar, Haryana 125047, India

PEER REVIEW

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James Venturini, PhD in Tropical Disease, Department of Biological Sciences, School of Sciences, São Paulo State University (UNESP), Av. Engenheiro Luiz Edmundo Carrijo Coube, 14-01, 17033-360, Bauru, SP, Brazil.

Tel: +55 14 3103 6078

E-mail: james@fc.unesp.br

Comments

This is a good study in which the authors determined the prevalence of syphilis in a tertiary care hospital in Agroha Hisar, Haryana, India. The results are interesting. Besides, the authors can use the statistic test, such as analyses of frequencies, in order to improve the quality of the paper.

Details on Page S499

ABSTRACT

Objective: To determine the prevalence of syphilis in a tertiary care hospital situated in Hisar, Haryana.

Methods: The study is a five year study (Jan 2006 to Dec 2010), in which a total of 1550 sera obtained from clinically suspected cases of syphilis and pregnant females were screened for cardiolipin antibodies by the rapid plasma reagin (RPR) test. The total number of males was 650 while the total number of females was 900.

Results: The RPR test was positive in 48 patients (3.09%). Out of a total of 850 pregnant females, 10 (1.18%) were tested positive through RPR test. Among the remaining 38 positive patients, males were 35 and females were 3. The most common age group affected was 19–24 years in both the sexes.

Conclusions: Our findings showed that there is a substantial benefit of using an economical test like RPR for the diagnosis of syphilis in resource-poor setting. Great importance should be given to the screening of pregnant females for syphilis.

KEYWORDS

Syphilis, Rapid plasma reagin, Venereal disease research laboratory, HIV, Sexually transmitted disease

1. Introduction

Since its recognition in the 15th century in Europe as a new disease, syphilis has been the subject of great mystery and legend. The greatest mystery of syphilis, however, is how the spirochete *Treponema pallidum* subsp. *pallidum* causes the many clinical features of disease. Syphilis is a chronic disease, and the only known natural host

of *Treponema pallidum* is human. Syphilis is acquired by direct contact, usually sexual, with active primary or secondary lesions. Congenital syphilis is of particular concern in developing nations, where the lack of prenatal testing and antibiotic treatment of infected pregnant women results in congenital infection of the foetus. Congenital syphilis causes spontaneous abortion, stillbirth, death of the neonate, or disease in the infant. Besides, what is of

*Corresponding author: Kawal Preet Kaur, HNo. 34 Type II New Campus, Maharaja Agrasen Medical College, Opposite Maharaja Agrasen Dham, Agroha, Hisar, Haryana 125047, India.

Tel: 919050551719

Fax: 911669281176

E-mail: dockawu25@gmail.com

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particular importance to worldwide health is the recognition that syphilis infection greatly increases the transmission and acquisition of HIV. These factors, along with the highly destructive nature of late disease, make syphilis an important public health concern[1].

The World Health Organization estimates that more than 12 million new cases of adult syphilis occur worldwide each year, and the disease can be transmitted congenitally and affects 500 000 or more infants annually[2]. Syphilis continues to be a major health problem in India. Conventionally the laboratory diagnosis is made by the direct identification of *Treponema pallidum* with dark ground microscopy, and demonstrating the antibodies by various serological tests[3]. Diagnosis by dark field microscopy is not always possible, therefore serological tests are of prime importance in the diagnosis of syphilis.

Proper laboratory diagnosis of syphilis will go a long way in preventing sexually transmitted disease (STD) related morbidity. This holds true in our setting as well. Our hospital is a tertiary care hospital situated in Hisar, Haryana which caters a population of more than 100 000 people including people from nearby states like Punjab and Rajasthan.

Hence this study was undertaken to determine the prevalence of syphilis in our area, using the rapid plasma reagin (RPR) test and to study various patient characteristics like the age, sex, presenting symptoms, RPR titre.

2. Materials and methods

This study was conducted over a period of five years (Jan 2006 to Dec 2010), in the Department of Microbiology, Maharaja Agrasen Medical College, Agroha Hisar, Haryana. A total of 1550 sera were obtained from clinically suspected cases of syphilis and pregnant women were screened for cardiolipin antibodies by the RPR card test (Tulip Diagnostics). The test was performed by collecting around 5 mL of venous blood from clinically suspected cases of syphilis. The sample was then transported to the laboratory using plain vial. The serum was then separated by centrifugation. The tests were conducted as per the manufacturer's instructions. All reactive samples were subjected to quantitative titration. Positive and negative controls were included in every run of the test.

3. Results

The total number of males was 650 while the total number of females was 900. The RPR test was positive in 48 patients

(3.09%) (Table 1). Out of a total of 850 pregnant females, 10 (1.18%) were tested positive through RPR test. Among the remaining 38 positive patients, males were 35 and females were 3.

Table 1

Sex and RPR positivity of the subjects.

Sex	Number Tested (%)	Positivity by RPR (%)
Male	650 (41.94%)	35 (72.92%)
Female	900 (58.06%)	13 (27.08%)
Total	1550	48

Among the non-reactive male patients, 78.05% were asymptomatic while dysuria (5.69%) and discharge (3.41%) were the common presenting complaints in the rest of the cases. As far as the reactive male patients are concerned, genital ulcers were present in 25.71% and discharge in 22.86% while 14.29% were asymptomatic.

Among the non-reactive female patients, 75.30% were asymptomatic while discharge (8.12%) and pelvic pain (3.95%) were the common presenting complaints in the rest of the cases. In the reactive female patients, genital ulcers were seen in 46.15%, discharge in 15.39% while 15.39% were asymptomatic.

The most common symptom in both the sexes was genital ulcer (Tables 2 and 3). The most common age group affected was 19–24 years in both the sexes. The RPR titre of patients in various age groups and in both the sexes is shown in Table 4.

Table 2

Symptoms in the male subjects.

Symptoms	RPR negative patients (%)	RPR positive patients (%)
Genital ulcer	22 (3.58%)	9 (25.71%)
Discharge	21 (3.41%)	8 (22.86%)
No symptoms	480 (78.05%)	5 (14.29%)
Rashes	14 (2.28%)	4 (11.43%)
Dysuria	35 (5.69%)	3 (8.57%)
Genital swelling	11 (1.79%)	3 (8.57%)
Itching	13 (2.11%)	2 (5.71%)
Pelvic pain	0	1 (2.86%)
Dyspareunia	19 (3.09%)	0
TOTAL	615	35

Table 3

Symptoms in the female subjects.

Symptoms	RPR negative patients (%)	RPR positive patients (%)
Genital ulcer	10 (1.13%)	6 (46.15%)
Discharge	72 (8.12%)	2 (15.39%)
No symptoms	668 (75.30%)	2 (15.39%)
Genital swelling	2 (0.23%)	1 (7.69%)
Itching	27 (3.04%)	1 (7.69%)
Rashes	11 (1.24%)	1 (7.69%)
Dyspareunia	34 (3.83%)	0
Dysuria	28 (3.16%)	0
Pelvic pain	35 (3.95%)	0
TOTAL	887	13

Table 4

Age-wise distribution and RPR titre of patients.

Age (years)	Male (n=35)		Female (n=13)		Total (n=48)
	Number	Titre	Number	Titre	
19–24	3	1:8	2	1:8	15
	5	1:16	1	1:16	
	3	1:32	1	>1:64	
25–29	5	1:8	1	1:2	9
	2	>1:64	1	1:8	
30–39	2	1:16	2	1:16	9
	3	1:32	2	1:32	
	2	1:4	1	1:4	
40–49	3	1:8			9
	3	1:16			
50–59	4	1:8	2	1:16	6

4. Discussion

The emerging epidemic of acquired AIDS/HIV diseases in India has made STD control as one of the imperative strategies and probably the most important one to decrease HIV transmission in the community. Baseline information on the prevalence of classical STDs in India is inadequate. Among the various STDs, the prevalence of syphilis in the community is pivotal[3].

Diagnosis of syphilis in clinical settings is usually made by symptoms and serological tests of the non-treponemal antibody type. RPR test is simple, fairly sensitive and economical. In our study, we screened a total of 1550 sera for cardiolipin antibodies by the RPR test over a five year period (Jan 2006 to Dec 2010).

We found that 48 out of 1550 patients screened were reactive by the RPR test. Thus the seroprevalence of syphilis was 3.09% in our area. The results are comparable to another study conducted in Rohtak, Haryana which has almost similar patient profile as ours. They have reported a seroprevalence rate of 3.2%[4]. However, according to Baughn and Musher, the prevalence can be as high as 10%[5].

Further, among the 48 positive cases, 35 (72.92%) were males while 13 (27.08%) were females, giving a sex ratio of 2.69:1. Our findings are comparable to a South Indian study which has reported a sex ratio of 3.63:1[6], whereas according to Singh and Romanowski, the ratio is 1:1[7].

The prevalence rate of syphilis in pregnancy varies from one geographical area to other and is greatly influenced by various epidemiological factors. The pregnant women must be screened in the areas where syphilis is common. Moreover, the costs of congenital syphilis are so high

that screening is cost effective even when the prevalence is very low. In India, the use of RPR/venereal disease research laboratory (VDRL) test for determining exposure to syphilis is part of routine antenatal care. We screened the sera of 850 pregnant women and observed a RPR positivity of 1.18%. A similar study conducted by Gupta *et al.* has reported a positivity of 1.47% in pregnant females[4].

Like other STDs, syphilis has been and continues to be a disease of younger, sexually active individuals. We recorded the maximum number of cases among both the sexes in the 19–24 years age group. Out of a total of 48 reactive patients, 15 were in this group, including 11 males and 4 females. This is in accordance with the data of Centers for Disease Control which states that almost half of the new STD infections occur among young people aged 15–24 years[6].

We also analysed the presence/absence of clinical symptoms in various patients. We also observed atypical presentations such that even asymptomatic patients were reactive with the RPR test. These missed cases of syphilis were detected by routine screening of antenatal females or high risk patients.

However, it should be remembered that biological false positives can occur with the RPR test. Antilipoidal antibody reactivity can arise as a result of tissue damage from recent or concurrent infectious diseases such as hepatitis or underlying autoimmune diseases like rheumatoid arthritis or systemic lupus erythematosus. These antibodies can cause a false-positive RPR or VDRL test. Because autoantibodies increase as a result of aging, elderly people are also at risk for a false-positive result[1].

The highly specific but less sensitive treponemal test(s) should be performed to confirm a reactive RPR prior to instituting therapy. An RPR titre can be used to monitor the effectiveness of treatment since the nontreponemal antibodies decrease with treatment and disappear altogether with time if treatment was effective[8].

The sensitivities of the RPR and VDRL syphilis diagnostic tests depend upon the stage of disease. Accordingly, the mean sensitivities during primary syphilis of the RPR and VDRL tests are 86% and 78%, respectively, while the sensitivities of both tests during secondary syphilis are 100%[1].

In our country where RPR test is highly economical, it may be preferred for screening, and selected doubtful test results should be confirmed by treponema pallidum

hemagglutination (TPHA) to make it most cost effective.

In our setup, we detected syphilis cases among pregnant females, who came to us for a routine antenatal check up. Hence, great importance should be given to the screening of pregnant females for syphilis.

Further, we found out that there is a substantial benefit of using an economical test like RPR for the diagnosis of syphilis in a resource-poor setting such as ours. However, there is always a need of more specific tests like TPHA especially in cases where the possibility of a biological false positive cannot be ruled out. Currently, due to the non-availability of the TPHA test in our setting, we confirmed cases with low RPR titres by demonstrating a rising titre in paired serum samples.

Conflict of interest statement

We declare that we have no conflict of interest.

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We are thankful to the Microbiology Department of Maharaja Agrasen Medical College. We also owe sincere thanks to our hospital administration for ensuring an uninterrupted supply of diagnostic kits.

Comments

Background

Syphilis is a chronic STD that presents a wide range of clinical manifestations and severe consequences. It is an important healthy issue because there is a strong correlation between syphilis lesions and HIV transmission.

Research frontiers

The seroepidemiological survey is an important tool for the development of new strategies in public healthy management, such as the optimization of early diagnostic and, thus, the immediate beginning of treatment.

Related reports

According to the authors, few related studies were carried out in India and they show similarities with the

present study.

Innovations & breakthroughs

Considering that previous studies in India showed similar results, the authors should emphasize their originality.

Applications

The use of RPR card test may be an interesting option for screening of syphilis, especially in asymptomatic infected-individuals.

Peer review

This is a good study in which the authors determined the prevalence of syphilis in a tertiary care hospital in Agroha Hisar, Haryana, India. The results are interesting. Besides, the authors can use the statistic test, such as analyses of frequencies, in order to improve the quality of the paper.

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