Original Article

PREVALENCE OF SYPHILIS AND HIV INFECTION IN BLOOD DONORS IN COSMOPOLITAN LAHORE DURING THE YEAR 2014

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ABSTRACT:

OBJECTIVE: To identify the reasons for increase in number of patients suffering from syphilis, among the blood donors reporting in Lahore.

SELECTED BLOOD BANKS: Chughtai Medical Laboratories, Gulberg. Doctors Hospital, Johar town. National Hospital, DHA, Lahore.

SAMPLE SIZE: samples were collected from 23,156 donors.

STUDY DURATION: From 1st January, 2014 to 31st December 2014.

METHODS: Large numbers of blood donors were screened for treponema antibodies in the serum.

ARCHITECT SYPHILIS TP TEST is a chemiluminescent micro particle immunoassay (CMIA) for the qualitative detection of antibody to Treponema pallidum (TP) in human serum.

RESULTS: Out of 23,156 blood donors screened, 1124 donors (4.9%) were detected positive for syphilis. One donor was HIV positive (0.0043%). Among the infected donors, 29.92% cases were O +ve, while only 1.18% cases were AB-ve blood groups. HIV positive individual was B+ve blood group.

CONCLUSION: The number of syphilis patients is on the rise in Lahore due to Treponerma Pallidum, which is evident from screening of large number of blood donors in high-turnout blood banks in Lahore. Moreover, public awareness campaign is required to educate the citizens regarding the complications and spread of this disease.

KEYWORDS: VDRL, CMIA, TP, HIV, TMP.

INTRODUCTION:

The number of patients, diagnosed to have sexually transmitted disease, is on the rise for last few years in Pakistan. There are Syphilis is caused by a spirochete, Treponema Pallidum. The well-known Syphilitic lesions typically involve external genital organs, or other extra genital sites such as anus, fingers, oropharynx, tongue, nipples, fingers etc. Regional non-tender lymphadenopathy follows invasion.

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Syphilis is characterized by vertical transmission from the mother to newborn. The disease can evolve in the latent phase in which syphilis is clinically unapparent. In severe forms, syphilis becomes fatal, especially in the tertiary stage of its infection[1].

Most common mode of spread of syphilis is due to unprotected sexual practices and infusion of unscreened blood preparations. Serological tests (nontreponemal and treponemal specific), in addition to patients' clinical history, are currently the primary methods for the diagnosis of syphilis[2].

Co relation of syphilis with other sexually transmitted diseases show that AIDS is a deadly disease caused by two types of viruses collectively designated as 'Human immune deficiency Virus' (HIV). In Pakistan, the prevalence of HIV is more than 5% among the addicts, injecting drug users (IDUs) estimated in about eight major cities of the country.

Phylogenetic analysis classifies HIV-1 into groups M (major), N (non M, non-N), and O (outlier). Group M viruses have spread throughout the world to cause the global AIDS pandemic. In Asia, subtype C is significantly present, particularly Pakistan and India.

HIV type-2 virus is similar to HIV-1 in its structural morphology, genomic organization, transmission and infectivity. However, HIV-2 is less pathogenic than HIV-1. Moreover, HIV-2 infections have a longer latency period with slower progression to disease along with lower rates of horizontal and vertical transmission. HIV-2 is classified into genetic subtypes A to G, with most infections caused by subtypes A and B[3].

The key immunogenic protein and antigenic target for serodetection of HIV infection is the viral Transmembrane protein (TMP). Antibodies against the TMP (anti-TMP) consistently are among the first to appear at seroconversion of HIV infected individuals. The anti-TMP response remains relatively strong throughout the course of the disease, as evidenced by the near universal presence of antibodies against the TMP in asymptomatic and symptomatic stages of HIV infection.

Sample Size

Blood samples of the donors were screened at three major blood banks; Doctors Hospital, Johar Town, National Hospital, Defense and Chughtai Medical Laboratories Lahore. Approximately 23,156 samples of donors were considered, who reported in these centers for donating blood during the year 2014. We conducted this study to estimate the rising prevalence of syphilis and AIDS from the blood donors reporting in three major blood units in cosmopolitan Lahore in the entire year 2014 (January to December), where significant number of blood donors report daily.

MATERIALS AND METHODS:

Screening of blood samples of donors in Doctors Hospital, National Hospital and Chughtai Medical laboratories was done from January 2014 to December 2014 period.

ARCHITECT syphilis TP test is a chemi luminescent micro particle immunoassay (CMIA) for the qualitative detection of antibody to Treponema pallidum (TP) in human serum on the ARCHITECT *i* system as an aid to diagnosis of syphilis and as a screen for donated blood to prevent transmission of Treponema pallidum to recipients of blood and blood components. The ARCHITECT syphilis TP essay uses CMIA technology with flexible essay protocols, referred to as Chemiflex. It is a dual step immunoassay procedure[4].

In the first step, sample microparticles coated with recombinant TP antigens (TpN15, TpN17 and TpN47) and Assay Dilutent are combined. Anti TP antibodies present in the sample bind to the TP coated micorparticles. In the second step, after washing, the acridinium-labeled anti-human IgG and IgM conjugate is added. Following another wash cycle, Pre-trigger and Trigger solutions are added to the reaction mixture. The resulting chemiluminescent reaction is measured as relative light units (RLUs).

Specimens with sample RLU/cutoff RLU values < 1.00 are considered non-reactive, whereas, specimens with sample RLU/cutoff RLU values ≥ 1.00 are considered reactive.

The ARCHITECT HIV antigen/antibody combo essay is a two step immune essay to determine the presence of HIV p24 antigen and

antibodies to HIV-1 (group M and group O), and, HIV-2 in human serum and plasma using CMIA technology. Specimens with signal/cutoff values (S/CO) greater than or equal to 1.00 are considered reactive for HIV p24 antigen or HIV-1/HIV-2 antibodies. Specimens with S/CO values less than 1.00 are considered non-reactive for HIV p24 antigens or HIV-1/HIV-2 antibodies.

RESULTS AND DISCUSSION:

Transmission of syphilis from infusion of unscreened blood preparations is undoubtedly among the commonest cause of horizontal spread of this disease. Samples were obtained from patients ranging 15 to 30 years of age. Out of 23,156 blood donors reporting in the entire year 2014, 1140 donors were found infected with treponema (4.9%). Approximately 95% donors were normal in this study.

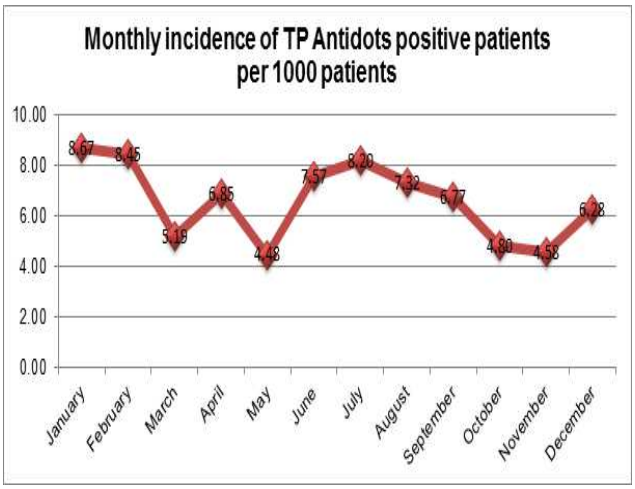

TABLE 1; PATIENTS SCREENED IN EACH MONTH IN YEAR 2014

MONTH OF YEAR 2014	TOTAL NUMBER OF DONORS IN YEAR 2014	PATIENTS POSITIVE FOR TP ANTIBODIES	PATIENTS POSITIVE FOR HIV-1/HIV-2
January	1269	11	Nil
February	1775	15	Nil
March	1925	10	01
April	1897	13	Nil
May	2011	09	Nil
June	2114	16	Nil
July	1829	15	Nil
August	2322	17	Nil
September	1478	10	Nil
October	2501	12	Nil
November	1966	09	Nil
December	2069	13	Nil
TOTAL	**23,156**	**1140**	1

Prevalence of TP antibodies was 4.92≈5patients per 100 donors (95% C.I 4.61 to 5.23)

Calculated mean value for serum Treponema antibodies titer in 1140 positive cases was 18.98. This also included the borderline cases[5]. We observed 4.92% of cases positive for syphilis in the year 2014. Total normal donors in the study were 95.07%

Only one patient, age 33 years, was detected to have asymptomatic HIV out of total 23,156 patients (0.0043%). Viral load in this case was 2.13, with blood group of B^+.

Average age of TPA positive patients in this study was 27 years. It is further interpreted that among the infected cases, 29.91% cases had O^+ blood group, 17.20% cases had AB^+ blood group, 12.30% cases B^+ group, 10.90% cases A^-, 10.12% cases A^+, 9.93% cases O^-, 8.46% cases B^- and only 1.18% cases had blood group of AB^-.

TABLE 2; BLOOD GROUPS OF INFECTED DONORS

BLOOD GROUPS OF SYPHILITC PATIENTS	CASES (PERCENTAGE)
O $^+$	29.91%
AB $^+$	17.20%
B $^+$	12.30%
A $^-$	10.90%
A $^+$	10.12%
O $^-$	9.93%
B $^-$	8.46%
AB –ve	1.18%

Similar study conducted on blood donors recently, reported 2.88% cases found infected with treponema. In November 2013 another study included 14,173 male donors for estimation of treponema antibodies and concluded 3.1% confirmed cases of syphilis among these cases. It is, however, noted that the above mentioned studies included a smaller sample size as compared to the current study on blood donors. Therefore, it is evident from our work that the number of syphilis infected patients in our densely populated city has considerably raised in 2014. This high prevalence of syphilis calls for more public awareness campaigns by health authorities and health workers altogether, and more stress needed through the electronic and print media, to educate the citizens regarding the transmission and complications of this crippling disease.

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Man is a wonderful creature; he sees through the layers of fat (eyes), hears through a bone (ears) and speaks through a lump of flesh (tongue).

Hazrat Ali (Karmulha Wajhay)