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## Seropositivity of pregnant women against HIV, HBs Ag, HCV and syphilis attending antenatal clinic in tertiary care hospital in Mumbai

**Meghana R Tendolkar, Shagufta N Kaskar, Praveen Mishra, Shashikant P Vaidya, Subhash A Angadi and Geeta V Koppikar**

#### Abstract

Present study was conducted for two years in Nair Hospital, Mumbai to analyze sero-evidence and co-infection if present with respect to antibodies to HIV1 and 2, Surface antigen to HBV, Antibodies to HCV and non-treponemal antibodies for syphilis. 2825 serum samples of pregnant women attending ANC of Nair Hospital was selected to detect the antibodies to HIV1 and 2 and 4% cases were found HIV positive. Further 230 serum samples from total cases were tested for hepatitis B surface antigen. Of these 230 cases, 100 cases were positive for HIV antibodies. From total cases, 1000 samples were screened for detection of antibodies for HCV and syphilis. Study showed incidence of HIV, HBV and HCV as 4%, 2.2% and 0.1% respectively. Co-infection of HIV and HBV, Syphilis and HBV was found to be 0.4%, while no co-infection was observed for HIV and HCV, HBV and HCV and Syphilis and HCV. To stop the vertical transmission of these infection, there is a need to continuously screen the serum of pregnant women at ANC.

**Keywords:** HIV, HCV, HBV, Syphilis, ANC and pregnant women

#### 1. Introduction

Screening for infections during antenatal care is important since many infections are asymptomatic yet treatable. Screening practices are standardized in high-income countries, but access to antenatal care testing is more limited in low- and middle-income countries where infection rates are elevated. Many women in these countries also present later for antenatal care, leaving less time for intervention when infection is detected<sup>[1]</sup>.

In a developing nation like India, Reproductive tract infections (RTI) and Sexually transmitted infections (STI) are the most common problem, which causes distress among the women of reproductive age group that in turn affects the family and society<sup>[2]</sup>.

Individuals suffering from RTI have significantly increased chance of acquiring and transmitting Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Herpes Simplex virus (HSV) and *Treponema pallidum*. Even though the advent of penicillin therapy has significantly reduced the incidence of syphilis, it still remains as a global health problem<sup>[3]</sup>.

Since HBV remains an endemic infection in many countries, the World Health Organization (WHO) recommends the administration of birth dose of univalent hepatitis B vaccine to all newborns to help reduce vertical transmission and routine antenatal screening guidelines are being developed<sup>[4]</sup> India accounts for 10 to 15% of the HBV carriers all over the world<sup>[5]</sup>

The mode of transmission for Hepatitis B and Hepatitis C infections are sexual, blood transfusion and through needle sticks injuries. Both HBV and HCV have significant association with the causality of hepatocellular carcinoma that appears years after infection. Screening for HBV and HCV infections are mandatory during blood transfusion, during surgeries, during pregnancy and if the person is diagnosed with any of the sexually transmitted disease<sup>[6]</sup>.

In pregnant women, the transmission to child leads to mid trimester abortion, still born and baby born with birth defects. Studies estimated that 15 to 40% of syphilitic patients develop late complication, if left untreated.<sup>[7]</sup> Therefore screening for HIV, HBV, HCV, HSV and Syphilis is mandatory for all cases with complaints suggestive of RTI/STI<sup>[8]</sup>.

There is a need to improve maternal and infant health outcomes with infection as one major focus area. In order to obtain baseline information to guide future interventions, we sought to estimate the prevalence and correlates of HBV, HIV, HCV and syphilis infection among pregnant women. Hence this study is aimed at estimating the proportion of HIV, HBV, HCV, HSV and Syphilis positive cases and co-infections by using serological methods at Nair Hospital, a tertiary care Hospital by testing sera of pregnant women attending ANC facility.

**2. Material and Methods**

**2.1 Place of work**

Study was carried out over a period of two years, from January 2003 to December 2004 after taking the permission from Institutional Ethics committee of T. N. Medical College and B. Y. L. Nair Charitable Hospital, Mumbai, in Department of Microbiology in association with Department of Obstetrics and Gynecology.

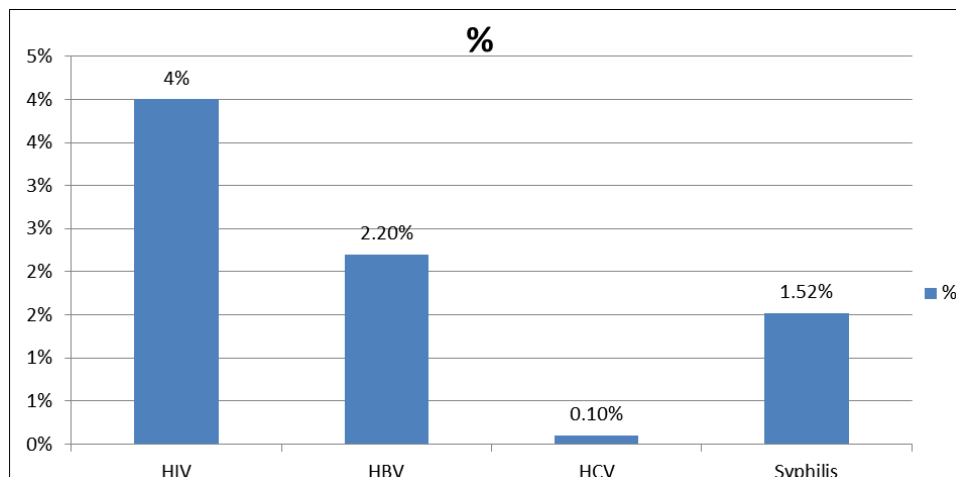
**2.2 Participants, Sample Collection and serological analysis**

2825 serum samples of pregnant women attending antenatal clinic of Gynecology department of Nair Hospital were

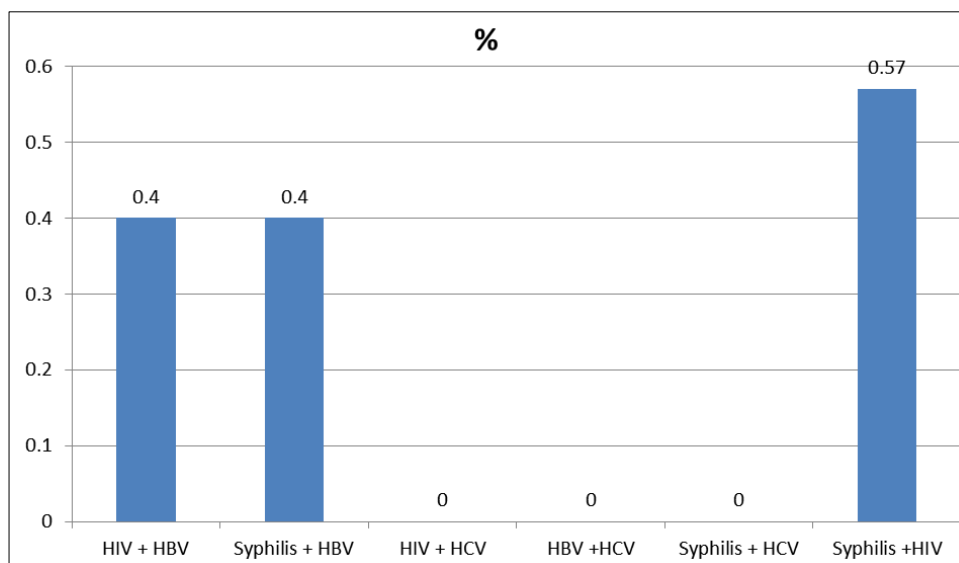
screened for antibodies to HIV 1 and 2, Hepatitis B surface antigen, antibodies to HCV and non-treponemal antilipoidal antibodies.

Blood was collected from the subjects and serum was separated. Serum samples were stored at -20°C and thawed when the tests were put up. Screening for HIV done by rapid diagnostic kits and interpreted according to NACO guidelines. The report for HIV testing was collected from ICTC with consent and strict confidentiality. Antibodies to HIV 1 (subgroups O and C) and HIV 2 was checked by Microlisa kit manufactured by J. Mitra and company. Antibodies to Hepatitis B surface antigen checked by Hepalisa kit manufactured by J. Mitra and company. Antibodies to Hepatitis C virus was detected by kit LG HCD 3 manufactured by LG chemical limited, Korea. Trepolipin was used to detect non-treponemal antilipoidal antibodies for syphilis by VDRL test, which was carried out by kit manufactured by Tulip Diagnostics Private limited, India.. All the serological tests were done as per the instructions supplied by the kit provider with appropriate quality check. Also all the serological work was carried out taking care of bio-safety measures and standard discard procedures.

**3 Results**



**Graph 1:** Incidence of HIV, HBV & HCV in pregnant women attending ANC. N (HIV testing) =2825, n(HBV testing) =230, n(HCV testing) =1000, n(Syphilis testing) =2825,



**Graph 2:** Co-infection found in pregnant women attending ANC n =2825

**Table 1:** Seroprevalence of syphilis in HIV positive and negative cases of pregnant women n =2825

Total cases studied 2825			
HIV positive cases 113 (4%)		HIV negative cases 2712 (96%)	
Syphilis positive cases 16 (14.16%)	Syphilis negative cases 97 (85.84%)	Syphilis positive cases 27 (1%)	Syphilis negative cases 2685 (99%)

#### 4. Discussion

Present study was conducted to analyze sero-evidence and co-infection if present with respect to antibodies to HIV1 and 2, Surface antigen to HBV, Antibodies to HCV and non-treponemal antibodies for syphilis. Study showed incidence of HIV, HBV HCV and syphilis as 4%, 2.2%, 0.1% and 1.52% respectively. Co-infection of HIV and HBV, Syphilis and HBV was found to be 0.4%, while no co-infection was observed for HIV and HCV, HBV and HCV and Syphilis and HCV.

Women of childbearing age have a risk of transmission of HBV to their offspring and hence it is a must to screen all the women for HBV infection and carrier state. We observed 2.2% of sera positive for HBV. This is an underestimate when compared with other studies that range from 9.51%- 14.07%.<sup>8</sup> But one study showed 1.89% of their study group were positive for HBV.<sup>[9]</sup> Vertical transmission of HBV to fetus causes low birth weight, prematurity and chronic complications. In women with acute hepatitis, the transmission rate is around 90%, whereas the chronic carrier state without immune prophylaxis, the rate ranges from 10 to 20%. The useful detection methods are ELISA for HBV antigens and antibodies and PCR for the viral DNA analysis. The sensitivity of HEPALISA used in India is around 99%.

<sup>[8]</sup> Rapid card test based on immune chromatography principle is also widely used but the sensitivity differs based on the manufacturer. Hence it is advisory to do appropriate laboratory method for the screening and diagnosis of HBV. India has a prevalence of HBV infection ranging from 2-8%, belonging to intermediate level incidence. Because of high population burden it is reported that it constitutes 10-15% of entire pool of HBV carriers in the world. Though definite mode of transmission is not known, contact with nonimpact skin, mucous membranes, tears, saliva and blood containing secretions or sharing of tooth brushes can contribute to the spread. In low socio economic groups, poor hygienic conditions, close person to person contact, certain socio cultural practices may facilitate transmission of both HIV and HBV infections.<sup>[10]</sup> In our study also same trend was seen. HIV and HBV co-infection and Syphilis & HBV co-infection was observed (0.4%)

In some studies also this trend is seen, HBV and HIV infections occurring at the same rate, as most of the pregnant women were from low economic strata<sup>[9]</sup>

In our study out of 2825 sera tested syphilis positive samples were 1.52%. Syphilis positive sera were found to be significantly high in number in HIV positive sera than HIV negative sera. The syphilis and HIV co-infection (0.57%) was observed in our study. Serological screening for syphilis in study by Murugesan M *et al.*<sup>[9]</sup> revealed 0.91% positivity in the study population as detected by RPR, which was further confirmed by TPHA. This finding was corroborative with 1.5% of syphilis cases identified by Prasad *et al.*,<sup>[11]</sup> In pregnant women, the transmission to child leads to mid trimester abortion, still born and baby born with birth defects. It is important to screen for syphilis for those who present with respective symptoms and signs to avoid the consequences of spread to partner.

In our study, HCV positive sera were found to be 0.1% and HIV & HCV, HBV & HCV and Syphilis & HCV co-infection was not seen. In the study by Murugesan M *et al.*,<sup>[9]</sup> HCV and HIV were negative among the group. This correlates with other studies, which estimates that HCV infection in pregnant women is 0.5%. In a meta-analysis, the pooled transmission rate of vertical transmission of HCV to neonate was 5.8%, whereas the carriers with HIV co-infection, the rate is 10.8%<sup>[12]</sup>.

The vulnerability of women to acquire HBV, HIV, HCV and syphilis is due to lack of knowledge about the infection rates, insufficient access to prevention, inability to adopt safer sex due to male dominance and lack of easy availability of female condoms. Hence targeted interventions should be aimed at prevention strategies through information and health education<sup>[9]</sup>.

The exact mechanism of mother-to-child transmission of HIV remains unknown. Transmission may occur during intrauterine life, delivery, or breastfeeding. The greatest risk factor for vertical transmission is thought to be advanced maternal disease, likely due to a high maternal HIV viral load.<sup>[13]</sup> Unfortunately, it has been reported that 30% of pregnant women are not tested for HIV during pregnancy, and another 15-20% receive no or minimal prenatal care, thereby allowing for potential newborn transmission.<sup>[14]</sup> In our study incidence of HIV was 4% and Co-infection of HIV & HBV and HIV & syphilis was observed. In one study the carriers with HIV co-infection, the rate is 10.8%.<sup>[12]</sup> In our study we didn't observe HIV and HCV co-infection, similar observations are made by other authors.<sup>[9]</sup>

#### 5. Conclusion

In spite of many control programs for preventing blood borne viral infections, they are not showing fall in number of new infections. Reduction of the HIV, HBV, HCV and syphilis disease burden in India can be achieved by educating the public, with special focus on pregnant women about transfusion safety, safe sexual practices, improved sanitation, and effective vaccination against HBV. A complex interplay of factors like sexual promiscuity, unprotected sexual behavior, stigma towards the sexually transmitted infections and non-availability of screening modalities at all the levels of health centers contributes to increased occurrence of genital tract infections in our country. Hence, screening for sexually transmitted infections by serological methods are mandatory in pregnant women with symptoms and signs of genital tract infections at all health care centers. To stop the vertical transmission of this infection, there is a need to continuously screen the serum of pregnant women at ANC.

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