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PREVALENCE OF HIV AND HBV IN PREGNANT FEMALES IN MANGALORE

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Abstract: Background and Aims- The pregnant women and her fetus are susceptible to many infections and infectious diseases. More than 90% of cases of HIV in children result from perinatal transmission and 10-85% of infants born to HBsAg positive mothers become infected depending on HBeAg status of the mother. Considering the clinical importance of HIV and HBV in pregnant mothers, their perinatal transmission and their effects on fetus, the present study was undertaken to determine the prevalence of HIV and HBV in pregnant women in our area.

Material and methods- This prospective study was conducted from June 2004 to July 2005. Serum samples from all pregnant women were screened for anti-HIV Ab and HBsAg. **Results-** Twelve hundred antenatal women were screened for anti-HIV Ab and HBsAg, of which 23 (1.9%) were found to be seropositive for anti-HIV Ab and 16(1.3%) for HBsAg. One case (0.083%) was positive for both anti-HIV Ab and HBsAg. **Conclusion-** The present study confirms the need for HIV and HBsAg screening to be added to the battery of routine prenatal tests.

Keywords: Pregnant mother, HIV, HBV, Perinatal transmission, HBsAg



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INTRODUCTION

The pregnant women and her fetus are susceptible to many infections and infectious diseases. Some of them may be quite serious and life threatening for the mother, whereas others may have a profound impact on fetal outcome. Approximately 80% of women infected with human immunodeficiency virus (HIV) are of reproductive age^[1] and among the women infected with HIV; transmission of the virus to the neonate occurs in 20-40% of the pregnancies.^[2] More than 90% of cases of HIV in children result from perinatal infections. The rate of transmission may be reduced to 8% by giving zidovudine before and during labour and to the newborn soon after birth.^[3]

Hepatitis B virus (HBV) infection is a major cause of acute and chronic hepatitis, cirrhosis and hepatocellular carcinoma. Although there are several mechanisms for transmission of HBV, perinatal transmission from hepatitis B carrier mother to neonate may be more important where HBV is endemic. This is because 10-85% of infants born to HBsAg positive mothers will become infected depending on HBeAg status of the mother.^[4] Out of which 90% become carriers of which 25% die of complications. But with prompt diagnosis of HBsAg positive mother and treatment of offspring after delivery with hepatitis B immunoglobulin and HBV vaccine 90% of the infections can be prevented.

Considering the clinical importance of HIV and HBV in pregnant mothers, their perinatal transmission and their effects on fetus, we conducted a study to determine the prevalence of HIV and HBV in pregnant women in our area.

Material and methods

Twelve hundred (n=1200) pregnant women who came for routine antenatal checkup from June 2004 to July 2005 were included in the study. Informed consent was taken from all of them after explaining the nature of the study in their own language. Serum samples from these women were screened for anti-HIV Ab by HIV Comb, J Mitra and Co Pvt. Ltd and HBsAg by Pathozyme, Omega Diagnostics. All anti-HIV Ab reactive samples were further confirmed by two simple/ rapid tests based on different principles- CapillusHIV-1/HIV-2 by Trinity, Biotech and HIV Tridot by Biotech Inc.

A detailed history was elicited from all anti-HIV Ab and HBsAg positive pregnant women with special emphasis on socioeconomic status, marital status, occupation of the pregnant female and her husband, sexual history- history of promiscuity, obvious genital lesions and exposure to sexually transmitted diseases from both husband and wife. Past history of jaundice, blood transfusion, drug abuse and surgery were also enquired.

RESULTS

Twelve hundred antenatal women were screened for anti-HIV Ab and HBsAg, of which 23 (1.9%) were found to be seropositive for anti-HIV Ab and 16(1.3%) for HBsAg. One case (0.083%) was positive for both anti-HIV Ab and HBsAg. Age wise distribution of the positive cases is shown in table I. Out of 23 pregnant females positive for anti HIV Ab 52.2% were seen in the age group 26-30 years while 50.0% HBsAg positive pregnant women were in the age group 21-25 years.

Distribution of positive cases according to their occupation and their husband's occupation is shown in table II and table III respectively. Of the 23 HIV seropositive cases 12 (52.2%) were housewives while 9/16 (56.3%) HBsAg positive cases were beedi rollers. Five (25.0%) cases of HIV were seen in wives of hotel workers, 4 cases were seen each among wives of manual labourers and driver/ conductor. Husband's of 10 (62.5%) HBsAg positive pregnant females were manual labourers.

Table IV illustrates the educational status of the positive cases, 10/23 (43.5%) HIV seropositive pregnant women were educated up to SSLC while 7 (43.8%) HBsAg positive pregnant women were illiterate.

Associated risk factors were seen in 17 HIV seropositive cases- promiscuous behavior in 13 (self 4 and husband's 9), history of blood transfusion in 3 and one was commercial sex worker. In HBsAg positive pregnant women history of associated risk factors could be elicited from only 3 cases- promiscuity in 1 and blood transfusion in 2 (Table V).

Nineteen out of 20 husband's of anti HIV Ab positive pregnant women also tested positive for anti HIV Ab while only 5/13 husband's of HBsAg positive pregnant women tested positive for HBsAg (poor compliance of 3 husbands'). Fifteen (68.2%) anti HIV Ab positive pregnant women and 11 (78.6%) HBsAg positive pregnant women had full term normal deliveries (Table VI).

DISCUSSION

HIV

It has been observed that in India and many South-East Asian countries, 80-90% of the infections result from heterosexual intercourse.^[5] HIV infection does not affect the maternal health or the course of pregnancy, labour, puerperium or lactation.^[6] Vertical transmission is a serious problem worldwide as WHO estimates that 14-40% infected untreated women transmit HIV to their children. Vertical transmission can occur in any one of the three ways- transplacentally during pregnancy, during labour and delivery and postnatally via breast milk, but majority of transmissions occur around the time of delivery i.e. 60-70%.^[7] So, for the

majority of women with HIV, interventions to reduce the risk of transmission can be focused on the last trimester of pregnancy.

In our study the prevalence of HIV in pregnant women was found to be 1.9%. Table VII shows the prevalence of HIV in pregnant women as reported from other parts of India. In a study conducted by Dasari RK Hanuman the prevalence rate of HIV in pregnant women in Mangalore was 1% in 1997 (unpublished data).^[15] Our study indicates an increase in prevalence of HIV in non high risk population. Kaur *et al*^[9] also reported increasing prevalence of HIV in pregnant women in Delhi region during their nine year study.

Most important mode of acquiring HIV infection in the present study was heterosexual promiscuity which accounted for 56.5% of the cases. 17.4% anti HIV Ab positive females had promiscuous behaviour and 39.1% had husbands with promiscuous behaviour. Our results are comparable to various other studies conducted in India^[9,13,14,16] and are in accordance with the data provided by WHO, SEARO,^[17] on HIV transmission in South East Asia. Our results are in contrast to studies conducted in Western countries where the main mode of transmission of HIV in women was intravenous drug abuse.^[18-20]

A strong association between histories of at least one sexually transmitted disease (STD) with HIV infection transmission has been established^[21] but in our study none of the seropositive pregnant women gave history of genital ulcers or STD. In our study 52.2% HIV infected cases were seen in the age group 26-30 yrs followed by 21-25 yrs (39.1%) and 52.2% HIV infected pregnant women were housewives. Thus high percentage of disease is affecting mainly the people in sexually active and economically productive age group. Maximum number of HIV seropositive women (87%) did not have any symptoms related to HIV infection and for these women, monotherapy with a single drug to prevent mother to child transmission of HIV would have been satisfactory. In our study only two women opted for antiretroviral therapy.

In the present study all the HIV positive pregnant women had very poor knowledge about HIV disease and its transmission and had low exposure to mass media. Hence, it is important to identify high risk groups in the population, for giving information, education and communication.

In the present study 68.2% women had normal vaginal deliveries with care being taken to avoid prolonged labour and premature rupture of membranes as both these factors increase the chance of transmission^[22] and 13.6% women delivered by LSCS. There is data showing 50-70% reduction in HIV transmission when caesarian section is performed.^[23,24] In our study 5/19 neonates were given nevirapine syrup and studies have shown that after delivery with in first 72 hours single dose of nevirapine reduces transmission by 41-12%^[25,26] and is cost effective also.^[27] This intervention is cheap and can also be given to women who present late.

HBV

In the present study 1200 pregnant women were screened for HBsAg by ELISA and 16 were found to be positive giving a prevalence rate of 1.3% which is comparable to the study done by Malecki *et al.*^[28]

Studies conducted in different parts of the world showed HBsAg carrier rate among pregnant women varying between 0.16-4.3% depending on the endemicity of the infection in that geographical area (Table- VIII). The variation in the HBsAg carrier rates in pregnant women as revealed by the results of various studies conducted could be due to a number of factors involved in the disease transmission and also due to the sensitivity of different techniques used for HBsAg detection.

In the present study, detailed history showed defined risk factors for HBV infection in only 5/16 pregnancies. Malecki *et al.*^[28] and Butterfield *et al.*^[32] could identify 38% and 50% pregnant females respectively with risk factors of HBV infection. The poor correlation between the historic risk factors and the carrier state for HBsAg provides further support to the CDC's recommendation for routine HBsAg testing in all pregnant women at the time of their initial prenatal screening.^[33]

In our study pregnancy course and outcome was found to be unaffected by the antigenemia. Eleven out of fourteen HBsAg positive females had full term normal delivery with live baby, two were taken up LSCS and only one had pre term delivery due to PIH. There was no IUD/ still birth. Our results are comparable to the study conducted by Pastorek *et al.*^[34]

CONCLUSION

HIV and HBV are health problems of global magnitude. No doubt they affect the high risk group but as seen in our study can affect low risk groups also. Thus, the present study confirms the need for HIV and HBsAg screening to be added to the battery of routine prenatal tests.

Table I: Age wise distribution of positive cases

Age group (years)	Anti HIV Ab+ (n=23)	HBsAg+ (n=16)
15-20	1 (4.3)	1(6.2)
21-25	9 (39.1)	8 (50)
26-30	12 (52.2)	5 (31.3)
31-35	1(4.3)	2 (12.5)

Table II: Distribution of positive cases according to occupation

Occupational group	Anti HIV Ab+ (n=23)	HBsAg+ (n=16)
House wife	12 (52.2)	5 (31.3)
Beedi roller	5 (21.7)	9 (56.3)
Cooli	3 (13.0)	0
Others like fish sale, baker, own shop	3 (13.0)	2 (12.5)

Table III: Seropositivity of wives in relation to husband's occupation

Occupational group	Anti HIV Ab+ (n=20)*	HBsAg+ (n=16)
Coolie/ manual labourer	4 (20.0)	10 (62.5)
Driver/ conductor	4 (20.0)	1 (6.3)
Hotel worker	5 (25.0)	3 (18.7)
Fisherman	3 (15.0)	1 (6.3)
Others eg. Beediroller, electrician, priest	4 (20.0)	1 (6.3)

*Out of 23 HIV seropositive pregnant females 20 were married while two were unmarried and one was widow.

Table IV: Distribution of positive cases according to education

Education	Anti HIV Ab+ (n=23)	HBsAg+ (n=16)
Illiterate	2 (8.7)	7 (43.8)
Up to 5 th std.	9 (39.1)	5 (31.3)
Up to SSLC	10 (43.5)	3 (18.7)
Up to PUC	1 (4.4)	1 (16.2)
Graduation	1 (4.4)	0

Table V: Risk factors in anti HIV Ab positive and HBsAg positive pregnant females

Risk factors	Anti HIV Ab+ (n=23)	HBsAg+ (n=16)
Promiscuity – Self	4 (17.4)	1 (6.3)
Husband	9 (39.1)	-
H/O blood transfusion	3 (13.0)	2 (12.5)
Commercial sex worker	1 (4.4)	0
No associated risk factor	6 (26.0)	13 (81.3)

Table VI: Pregnancy outcome

Outcome	Anti HIV Ab+ (n=22)*	HBsAg+ (n=14)**
FTND	15 (68.2)	11 (78.6)
LSCS	3 (13.6)	2 (14.3)
IUD/ still birth	1 (4.6)	0
MTP	3 (13.6)	0
Preterm	0	1 (7.1)

FTND- full term normal delivery, LSCS- lower segment caesarean section, IUD- intrauterine death, MTP- medical termination of pregnancy

*One anti HIV Ab positive case was lost to follow up

**Two HBsAg positive cases were lost to follow up

Table VII prevalence of HIV in pregnant women as reported from other parts of India

Author	Place	Prevalence (%)
Deo, ⁸ 1995	Maharashtra	4.56
Kaur <i>et al</i> , ⁹ 1996	New Delhi	0.83
Kant <i>et al</i> , ¹⁰ 1998	Slums of Delhi	0
Ravikumar <i>et al</i> , ¹¹ 1999	Chennai	0.4
Gopalan <i>et al</i> , ¹² 1999	Chandigarh	0.036
Arora <i>et al</i> , ¹³ 2000	Rohtak	0.11
Dave <i>et al</i> , ¹⁴ 2002	Indore	6.6
Present study	Mangalore	1.9

Table VIII Prevalence of HBsAg in pregnant women as reported in different studies in India

Authors	Place	Prevalence (%)
Samal <i>et al</i> , ²⁹ 1986	Sevagram	4
Datta <i>et al</i> , ³⁰ 1987	Varanasi	3.1
Anupkumar <i>et al</i> , ³¹ 1998	Aurangabad	2.66
Present study	Mangalore	1.3

REFERENCES

1. Stratton P, Mofenson LM, Willoughby AD: HIV infections in pregnant women under care at AIDS clinical trials centers in the United States. *Obstet Gynecol* 1992; 79(3) : 364-8.
2. Oxtoby MJ: Perinatally acquired human immunodeficiency virus infection. *Pediatr Infect Dis*. 1990; 9(9) : 609-19.

3. Connor EM, Sperling RS, Gelber R, Kiselev P, Scott G, O'Sullivan MJ, *et al*: Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. Pediatric AIDS Clinical Trials Group Protocol 076 Study Group. N Engl J Med 1994; 331(18) : 1173-80.
4. Stevens CE, Beasley P, Tsul J, Wy-Chan Lee MD: Vertical Transmission of Hepatitis B Antigen in Taiwan. N Engl J Med 1975; 292 : 771-4.
5. Balaji LN: Women and AIDS. J Indian Med Assoc 1994; 92(1) : 15-6, 38
6. Johnstone FB: HIV and pregnancy. Br J Obst Gyn 1996; 103 : 1184-90.
7. C Chouquet: Timing of human immunodeficiency virus type 1 (HIV-1) transmission from mother to child: Bayesian estimation using a mixture. Stat Med 1999; 18 : 815-33.
8. Deo S: Sero-surveillance of HIV infection in pregnant mothers and neonates. IJMM 1995; 13(2) : 99-100.
9. Kaur R, Sharma VK, Mathur MD: Increasing prevalence of HIV infection in pregnant women in Delhi region. IJMM 1996; 14(3) : 161-2.
10. S Kant, M.S Patel, P Seth, B Booth, K Martin: HIV sero-prevalence among pregnant women residing selected slums of Delhi. IJCM 1998 ; 23(3) : 116-9.
11. Ravikumar B, Sathiyasekaran BW, Sivaprakam P, Shanmugasundaram V, Solomon S, Shirley C: Prevalence of HIV infection among antenatal mothers in Chennai (Madras) India. J Obstet Gynecol India 1999; 49 : 61-3.
12. Gopalan S, Bagga R, Jain V, Dhaliwal LK, Roy P, Panigrahi D: Antenatal HIV testing- results of a pilot study from north India. J Obstet Gynecol India 1999; 49 : 40-4.
13. Arora DR, Gupta V, Arora B: Surveillance of HIV Infection in Haryana. IJCM 2000; 25(1) : 19-21.
14. Dave A, Jajoo S, Singh R, Nahar A, Thakur R. Thakur R: Serosurveillance of HIV in reproductive age group women. J Obstet Gynecol India 2002; 52(3) : 93-6.
15. Dasari RKH. The prevalence rate of HIV in pregnant women in Mangalore [dissertation]. Manipal Academy of Higher Education (1997): 50-55.

16. Madhivanan P, Hari A, Geetha HKA, Lambert JS, Solomon S: Profile of HIV infected pregnant women and the interventions used in prevention of perinatal transmission of HIV at a tertiary care centre in south India. *J Obstet Gynecol India* 2002; 32(2) : 43-7.
17. Deodhar NS: Epidemiology of HIV infection – a critique. *IJCM* 1998; 23(4) : 176-84.
18. Mary E, Guinan, Hardy A: Epidemiology of AIDS in women in the United States. *JAMA* 1987; 257(15) : 2039-42.
19. Smith R, Patel NB, George ED, Urquhart, McFaul P, Neven P, *et al*: Prevalence of HIV antibody and pregnancy in Tayside, 1984-9 background to screening. *BMJ* 1990; 301 : 518-21.
20. Gwinn M, Pappaioanou M, George JR, Hannon WH, Wasser SC, Redus MA, *et al*: Prevalence of HIV infection in childbearing women in the United States. Surveillance using newborn blood samples. *JAMA* 1991; 265(13) : 1704-8.
21. Ghyis PD, Fransen K, Diallo MO, Ettiègne-Traoré V, Coulibaly IM, Yeboué KM, *et al*: The associations between cervicovaginal HIV shedding, sexually transmitted diseases and immunosuppression in female sex workers in Abidjan, Côte d'Ivoire. *AIDS* 1997; 11(12) : F85-93.
22. European Collaborative Study. Risk factors for mother-to-child transmission of HIV-1. *Lancet* 1992; 339(8800) : 1007-12.
23. The European mode of delivery collaboration. Elective caesarean- section versus vaginal delivery in prevention of vertical HIV-1 transmission: a randomized clinical trial. *Lancet* 1999; 353(9158) : 1035-9.
24. The international perinatal HIV group. The mode of delivery and the risk of vertical transmission of human immunodeficiency virus-1: a metanalysis of 15 prospective cohort studies. *N Engl J Med* 1999; 340(13) : 977-87.
25. Guay LA, Musoke P, Fleming T, Bagenda D, Allen M, Nakabiito C, *et al*: Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomised trial. *Lancet*. 1999; 354(9181) : 795-802.
26. Christie AB, Allam AA, Aref MK, Muntasser IH, El-Nageh M: Pregnancy hepatitis in Libya. *Lancet* 1976; 2(7990) : 827-9.

27. Coutsooudis A, Pillay K, Spooner E, Kuhn L, Coovadia HM: Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study. South African Vitamin A Study Group. Lancet. 1999; 354(9177) : 471-6.
28. Malecki JM, Guarin O, Hulbert A, Brumback CL: Prevalence of hepatitis B surface antigen among women receiving prenatal care at the Palm Beach County Health Department. Am J Obstet Gynecol 1986; 154 : 625-6.
29. Samal S, Pandit S, Samal N: Prevalence of HBsAg in asymptomatic pregnant women and in the cord blood of their newborns. J Obstet Gynecol India 1986; 104-7.
30. Datta SK, Gulati AK, Pandey LK, Pandey S: HBV carriage in pregnant women. J Commun Dis 1988; 20(3) : 209-12.
31. AR Anvikar, AA Gaikwad, AB Deshmukh, AS Damle, J Ather: HBV Carriage rate in women attending antenatal clinic. IJMM 1999; 17(4) : 193.
32. Butterfield CR, Shockley M, San Miguel G, Rosa C: Routine screening for hepatitis B in an obstetric population. Obstet Gynecol. 1990; 76(1) : 25-7.
33. Petermann S, Ernest JM: Intrapartum hepatitis B screening. Am J Obstet Gynecol. 1995; 173(2) : 369-73 ; 373-4.
34. Pastorek JG 2nd, Miller JM Jr, Summers PR: The effect of hepatitis B antigenemia on pregnancy outcome. Am J Obstet Gynecol. 1988; 158(3 Pt 1) : 486-9.