

Antenatal HIV Testing - Results of a Pilot Study from North India.

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Summary : Over a period of one and a half years, 2780 consecutive pregnant women attending the antenatal clinic and labour room of Nehru Hospital attached to Postgraduate Institute of Medical Education and Research were interviewed to obtain a history of risk factors for HIV infection. The women underwent a voluntary screening for HIV antibodies.

Risk factors for HIV were present in only 1.15% of women, the principal one being blood transfusion (1.04%). Only one woman screened positive for HIV antibody making a seroprevalence rate of 0.036%. The associated risk factor was a history of unscreened blood transfusion 3 years back.

Introduction

First recognised in 1981, AIDS, caused by HIV was initially associated epidemiologically with homosexual men. Soon it was recognised that HIV also spreads through heterosexual contact and is perinatally transmitted. The significance of HIV infection in pregnant women cannot be overemphasized, with perinatal transmission rates reported between 20-39% in developing countries (Orloff et al, 1996).

Screening of pregnant women for HIV has many advantages. In areas with high prevalence of infection, a negative test would provide an assurance to women that they are uninfected. In low prevalence areas where heterosexual promiscuity is mainly responsible for the spread of HIV infection, most of the HIV infected females do not belong to any recognizable high risk group. Routine screening of all pregnant women would help to identify the sero-positive women.

Counselling for medical termination of early pregnancy in seropositive pregnant women may be considered. For those who wish to continue pregnancy, preparation for intensive care of infected children could be made.

Estimates regarding magnitude of HIV infection in pregnant women are essential for planning necessary intervention measures. At present India is experiencing a major epidemic of HIV transmission in high-risk population of commercial sex workers, sexually transmitted disease clinic patients, intravenous drug users

and commercial blood donors. There is evidence of recent spread of the epidemic from these high risk groups to other groups and it is estimated that 1.6 million people are currently infected with HIV in India (Bollinger et al, 1995). In 1990, the estimate of seropositivity in India showed an incidence of 30% among commercial sex workers, 5-10% among STD patients and 0.1-0.5% among pregnant women (Ramachandran, 1990). Current data show a rising trend and reports received from various parts of the country reveal HIV seroprevalence in antenatal women of 0.8% in Manipur (East India), 2.5% in Bombay (West India), 1.1% in Salem (South India) (Lal et al, 1995) and 0.054% in Vellore (South India) (Jacob et al, 1993). As yet no data is available regarding the seroprevalence of HIV in North Indian pregnant women. The present study has been carried out to estimate the seropositivity rate among the pregnant women population in North India and the associated risk factors so that future measures can be planned accordingly.

Material and Methods

Two thousand seven hundred and eighty consecutive pregnant women attending the antenatal clinic and labour room of Nehru Hospital attached to Postgraduate Institute of Medical Education and Research, Chandigarh over a period of 1½ years were screened for HIV antibody. This institute caters to the north Indian population and is a referral centre for the neighbouring states of Punjab, Haryana, Himachal Pradesh and Jammu & Kashmir. Voluntary testing of blood samples (determination of HIV antibody status with the individual's consent) was carried

out. Individual's identifying details were kept with the sample (named testing). The women were screened irrespective of the risk status. The subject's identification data included gestation, socio-economic status which included the educational status, occupation and the income of both husband and wife was noted.

A detailed history of previous blood transfusion, intravenous drug abuse, STD's and any extra marital sexual contact of either partner was taken in order to determine the presence of high risk factors in the subjects. The method of contraception adopted by the couple was also noted.

Five ml venous blood was drawn from each subject using disposable needle and syringe. Serum was separated and stored at -20°C using 0.1% thiomersal as the preservative.

ELISA for the detection of antibodies (IgG and IgM) against HIV1 and HIV2 (GP160) recombinant protein and peptides mimicking the immunodominant epitopes of manufacturer's instructions were strictly adhered to. The first 800 serum samples were tested following the instructions supplied with the kit. Due to higher false positivities, the rest of the samples were tested following the modified/updated method supplied by the manufacturers. The modifications included an additional BLANK well (no serum and no conjugate, only substrate) and increasing the number of washing cycles to four after the serum step and eight after the conjugate step. Washing was carried out with the automated positive pressure washer (SLT-812 SW 1), with an additional bottom wash in each cycle. Readings were taken at 492 nm (reading wave length) and 620 nm (reference wave length) with an SLT 340 ATC ELISA reader. The validation and cut off criteria were strictly adhered to.

Samples which were found to be positive by this method were sent to AIDS reference Laboratory, National Institute of Communicable Diseases, Delhi for confirmation.

Results

Characteristics of the population screened

Of the women screened, nearly 80% were between 21 and 30 years of age. Majority were either primigravidae (44.4%) or second gravidae (28.6%).

More subjects belonged to urban areas rather than rural areas. Of the subjects screened, 65.2% lived in urban areas and only 34.8% resided in rural areas.

Table 1 shows the occupation of these women. Most (89.3%) were housewives. A very small number were engaged in professional (90.4%) or semi-professional (2.5%) duties. Amongst the occupations of their husbands, (Table 1), it was observed that none were unemployed. The largest group comprised of clerks, shop owners and farm owners (37.7%).

Table - I
Occupation of Antenatal Women and Husbands of Subjects
(Modified Kuppuswamy Scale) Mahajan et al, 1991)

Occupation	Antenatal women	Husbands
Professional	12(0.4%)	132(4.7%)
Semi-professional	68(2.5%)	127(4.6%)
Clerk, shop owner, farm owner	187(6.7%)	1049 (37.7%)
Skilled worker	19(0.7%)	286 (10.3%)
Semi-skilled worker	6(0.2%)	717 (25.8%)
Unskilled worker	6(0.2%)	469 (16.9%)
House wife	2482 (89.3%)	-
Total	2780	2780

Contraceptive practice prior to the current pregnancy was recorded in all women and this distribution is shown in table II. It was observed that 83.6% did not practice any contraception prior to planning this pregnancy.

While admitting the women to the present study, detailed history was recorded regarding risk factors for HIV Table II

Table II
Contraceptive use among subjects prior to current pregnancy

Method of Contraception	No. of Subjects	Percentage
IUCD	140	5.0
Conventional methods	275	9.9
Natural methods	27	1.0
Oral pills / hormonal contraceptives	15	0.5
No contraception	2323	83.6
Total	2780	100

infection (Table III). There was history of previous

Table III
Risk Factors among subjects

Risk factors	Number	Percentage
History of blood transfusion	29	1.04
History of sexually transmitted diseases	3	0.11
Promiscuous sexual behaviour (subject or spouse)	None	Nil
Drug abuse		
Subject	None	Nil
Spouse	None	Nil
Total	32	1.15

unscreened blood transfusion in 1.04%. History of sexually transmitted diseases was reported by only 0.11%. Promiscuous sexual behaviour and drug abuse were not reported by any women.

Prevalence of HIV infection

Of the 2780 samples analysed, ELISA positivity was observed in 11 women (0.39%). These samples were sent to AIDS reference laboratory in Delhi and confirmatory evidence by western blot was seen in only one woman (0.036%) (Table 4).

Details of HIV positive woman

She is a 26 years old woman who is a resident of a village in North India. She was screened for HIV antibodies at 36 weeks gestation. She has delivered two children prior to the current pregnancy, the second one of which was by a caesarean section 3 years back. At that time she had received blood transfusion. There was no other risk factor for HIV infection. Following delivery, she used a Copper-T for 2 years for contraception. She is uneducated and a

Table IV
Results of HIV tests (Screening and confirmatory)

Sr. No.	Code No.	Age (yrs)	Risk Factor	Test at PGIMER Elisa HIV 1+HIV 2 (GeneIavia)	Tests at AIDS Reference Laboratory, Delhi				Interpretation
					Elisa I HIV 1 + HIV 2 (GeneIavia)	Elisa II HIV 1 + HIV 2 (Immunocomb)	Confirmatory Test (Western Blot)		
					HIVI	HIV2			
1.	393	25	Nil	Reactive	Reactive	Non reactive	Negative	Not done	Negative
2.	778	25	Nil	Reactive	Non-Reactive	Non reactive	Negative	Not done	Negative
3.	796	32	Nil	Reactive	Reactive	Non reactive	Negative	Not done	Negative
4.	907	24	Nil	Reactive	Non-reactive	Non-reactive	Negative	Not done	Negative
5.	1336	26	Nil	Reactive	Non-reactive	Non-reactive	Negative	Not done	Negative
6.	1500	21	Nil	Reactive	Non-reactive	Non-reactive	Negative	Not done	Negative
7.	1531	31	Nil	Reactive	Non-reactive	Non-reactive	Negative	Not done	Negative
8.	1731	26	H/o Blood Transfusion	Reactive	Reactive	Positive	Positive	Not done	Positive
9.	2162	28	Nil	Reactive	Non-reactive	Non-reactive	Negative	Not done	Negative
10.	2182	23	Nil	Reactive	Non-reactive	Non reactive	Indeterminate	Negative	Negative
11.	2282	27	Nil	Reactive	Non-reactive	Non-reactive	Negative	Not done	Negative

housewife. Her husband is educated till class 8 and is a labourer. She had no clinical signs and symptoms of HIV infection.

Neonatal Outcome

This woman was screened at 36 weeks gestation. Anencephaly had been diagnosed and the pregnancy was terminated. There was no maternal complication.

Discussion

Obstetricians and Gynaecologists have become increasingly involved in this epidemic as they provide reproductive health care to thousands of HIV infected women. Their interaction with sexually active women provides a unique opportunity to educate patients about the risk of infection and ways to reduce them.

Cases of AIDS represent only a fraction of population infected with HIV virus. Asymptomatic HIV infected women are at risk for transmitting the infection to their offspring. Thus HIV status should ideally be known for all pregnant women. In the United States a consensus has emerged favouring routine voluntary HIV antibody screening in pregnancy, especially in the light of reduced perinatal transmission by zidovudine used in pregnancy (US Public Health Recommendations, 1995) But the situation is not that simple. Background infection rates and testing facilities available in a given centre dictate the policies for HIV testing.

Several epidemiologic studies have been carried out to detect the prevalence of HIV infection among antenatal women in a given population. A large scale routine antepartum screening of an Inner-city population of Atlanta (USA) was published by Lindsay et al (1989). They screened 3472 women for presence of HIV antibody and found a seropositivity rate of 2.8/1000. The prevalence of intravenous drug abuse was 30% in this study. Forty percent of women were presumably infected by heterosexual contact. A seroprevalence rate of 8.0/1000 has been reported from inner city hospital in Massachusetts (USA) by anonymous testing of newborn cord blood. (Hoff et al, 1988). The higher prevalence

rate has been attributed to intravenous drug abuse. A national population based survey in the US revealed a seroprevalence rate of 1.5/1000 with highest in New York (5.8/1000) among parturients (Gwinn et al, 1991). Serological testing of newborn blood samples in UK (Ades et al, 1991) and Scotland (Tappin et al, 1991) revealed a seroprevalence rate of 0.59/1000 and 0.29/1000 respectively. Seropositivity rate among pregnant women attending antenatal clinics in India ranges between 1-5/1000 (Ramachandran, 1990) and 0.054% to 2.5% (Lal et al, 1995).

This study has identified a low incidence of seroprevalence (0.036%) of HIV infection in the pregnant women attending PGIMER, Chandigarh. The incidence of drug abuse and promiscuous sexual behaviour are also apparently low. The low prevalence of seropositivity may partly be attributed to an absence of these risk factors. The main risk factors identified were history of blood transfusion and sexually transmitted disease (1.04% and 0.11% respectively). The only woman found to be seropositive had a history of blood transfusion. This is in agreement with the observation of the Indian Council of Medical Research (ICMR) expert group on hospital policies pertaining to HIV infection which recommended that in Indian context HIV infection should be considered as a sexually transmitted or transfusion transmitted disease (Ramachandran, 1990).

Routine antenatal screening is desirable in areas of high prevalence. In areas of low prevalence screening of high risk groups has been recommended by ACOG and CDC (MacGregor, 1991). This is especially important in countries like India where facilities for diagnosis of HIV infection are not readily available. Moreover, the cost of screening the entire pregnant population would be prohibitive. Some large studies (Lindsay et al., 1989 & Barbaecci et al, 1991) have shown that a sizeable number of seropositive women could not have been detected if the CDC recommendation for counselling and testing of HIV antibody had been followed. Women may be unwilling to admit the risk behaviour or may be unaware of the risk. (Connor et al, 1989). However, these studies showed a high rate of seroprevalence (2.8/1000) (Lindsay

et al, 1989) and the results may not be applicable to our population.

The present study shows a low incidence of HIV seropositivity in this region. Unscreened blood transfusion was the only risk factor observed in the seropositive woman. The risk factors may not be the same everywhere and vary in different sets of population. Determining the risk factors in a particular population or geographical area can help to formulate the screening policy for HIV infection. A comprehensive and reliable plan to provide safe blood supply, prospective studies of risk factors and education of the public regarding HIV infection is the present day need to control the spread of HIV infection in India. Also, suitable precautions can be taken by health personnel while handling subjects with known risk factors, although universal precautions have been advocated for all. On the basis of this study it may be recommended that at present in our population a selective screening based upon the history of risk factors such as previous unscreened blood transfusion may be cost effective. Hence this study reinforces the need for routine screening of blood for HIV before transfusion.

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