

HIV Seropositivity among the Antenatal Women Attending ICTC at Tertiary Care Hospital

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Abstract: HIV seropositivity is a significant health hazard for antenatal women. Moreover, the seropositivity is used to estimate the HIV seroprevalence in the general population as part of sentinel surveillance extrapolation. We aimed to assess the HIV seroprevalence among the antenatal women and determine its relation with some relevant variables like age group, education, occupation, marital status and parity etc. It was a cross-sectional study conducted among 4,187 antenatal women attending the Integrated Counseling and Testing Centre in the Government Maternity Hospital attached to S.V. Medical College, Tirupati. We conducted the study during 2013-2014. The record of the Integrated Counseling and Testing Centre was used to collect the required information regarding HIV seroprevalence. We found that most of the subjects were aged 20-29 years (90.2%), secondary and higher level literates (74.12%), married (99.95%), housewives (86.05%), nullipara, primigravida and para 1 (93.36%), referred by ANC/OBG/PPTCT (99.88%). The seroprevalence was found to be 0.36%. We noted significantly higher prevalence in the unmarried group (50.0%), para 3 (8.33%), those directly coming for delivery (60.0%), illiterates (0.77%), and primary literates (0.86%). Insignificantly higher prevalence was observed in less than 20-year age group (0.69%), 30-34 year age-group (1.05%), and those engaged as daily labourers (0.50%). The HIV seroprevalence is 0.36% among antenatal women. The unmarried group, those directly coming for delivery, and those with higher parity constitute risk factors for seroprevalence.

Keywords: Human immunodeficiency virus (HIV), Acquired immunodeficiency syndrome (AIDS), Antenatal women (AW), Integrated counselling and testing centre (ICTC), Seroprevalence (SP).

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I. Introduction

Human immunodeficiency virus (HIV) is spreading steadily throughout the world. Developing and underdeveloped countries are severely affected by various reasons.¹ In recent years, Acquired Immune Deficiency Syndrome (AIDS) caused by HIV has emerged as the greatest threat to human existence. Even though India is categorised as a nation of low HIV prevalence, it has the third largest number of people living with HIV/AIDS.² The disease is spreading mainly through unsafe heterosexual activity. HIV seropositivity is a significant health hazard for antenatal women. The incidence of infection, especially in sexually active young people is the most sensitive marker to track the course of the HIV epidemic. Unfortunately, the incidence is hard to measure directly, but prevalence in young women is an indirect but useful tool.³

HIV infection is transmitted vertically from mother to child.⁴ The predominant mode of HIV transmission is through heterosexual contact. Therefore, women are at high risk of getting the infection.⁵ In India, the main risk behaviours and practices that are associated with a higher risk of HIV transmission include unprotected sexual intercourse, IV drug use, and transfusion of contaminated blood and blood products. The heterosexual route is the most common route of transmission which is associated with the factors like presence of untreated ulcerative sexually transmitted infections, irregular use of condoms, frequent sexual contact and the age of sexual initiation. HIV is an infection which many people have fears about, prejudices or negative attitudes. Stigma results in people with HIV being insulted, rejected, gossiped about and excluded from social activities.⁶

In many regions within the country HIV prevalence has been increasing among pregnant women. HIV screening in antenatal women is important because HIV can be transmitted from an infected mother to child during pregnancy, labour, delivery and through breastfeeding. In the absence of breastfeeding most infections occur during labour and delivery. Transmission rates of 13 to 32% were reported in industrialised countries and 25 to 48% in developing countries.⁷ Since a few studies on HIV seroprevalence in antenatal women are

available from India and few indicating seroprevalences in this area we undertook this study to document the prevalence and the risk factors in relation to age group, education, occupation, marital status parity and type of antenatal women whether with antenatal checkup or coming directly for delivery. Tirupati is an important pilgrim centre not only for people within but also outside the country where the population is much floating. Therefore, in the perspective of International Congress on Women’s Health 2014, the present retrospective study was undertaken to determine the rate of HIV seroprevalence among the antenatal women attending ICTC of Government Maternity Hospital, Tirupati, a tertiary care centre in Andhra Pradesh of South India.

II. Material and Methods

This is a cross-sectional study conducted among women registered at antenatal clinic of Government Maternity Hospital, Tirupati, a tertiary care centre. During 2013-2014, 4,187 antenatal women were studied after getting the Ethical Committee approval. After rendering pre-test counselling and obtaining informed written consent, 3-5 ml sample of blood was collected from each antenatal woman, and HIV testing was done as per the protocol and standard guidelines of National Aids Control Organization (NACO).⁸ The blood samples collected were subjected to three screening tests. The first test done was Comb AIDS, the second was PAREEKSHAK HIV 1/2 Triline Card Test [Bhat Bio-Tech India (P) Ltd.], and the third test was Tri-spot. The first test kit was of highest sensitivity, and the specificity increases with second and third kits. Therefore, when the test with the first test kit was negative, second and third kit-tests were not done and the result was negative for that tested sample. When the first test was reactive, then the second and third rapid kit tests were performed, and if these two tests were also reactive, then the final result was given as reactive for that tested sample.⁸ Results were analysed under the variables like age group, educational status, gestation in lunar months, occupation, marital status, parity and type of antenatal women. Post-test counselling was done based on the test result.

III. Results

A total number of 4,187 antenatal cases registered for pretest counselling and HIV testing during 2013-2014 in Government Maternity Hospital, Tirupati, were taken for the present study. The data was collected and analysed using SPSS version 20 (SPSS Inc., Chicago IL). The demographic characters of the antenatal women studied were shown hereunder. [Table 1]. It was found that most of the antenatal women were aged 20-29 years (90.2%), secondary and higher level literates (74.12%), married (99.95%), housewives (86.05%), nullipara & primipara (93.36%), and those referred by ANC/OBG/PPTCT (99.88%). 15 out of 4,187 were found to be HIV seropositive (0.36%), 4,169 seronegative (99.57%) and 3 were indeterminate (0.07%) [Table 2]. 30-34 year age-group showed highest seropositivity (1.05%) followed by less than 20 year age-group (0.69%), 25-29 year age-group (0.47%) and 20-24 year age-group (0.27%). Statistical analysis showed that age-specific prevalence was insignificant with a P value 0.52 [Table 3 and Figure 1]. Education-wise highest seropositivity was observed in those with primary education (0.86%) followed by illiterate (0.77%), secondary education (0.24%) and collegiate (0.14%), and was significant with a P value 0.024 [Table 4 and Figure 2]. Gestation in lunar month-wise seropositivity was high in 3rd month (0.84%) followed by (0.83%) and (0.42%) in 9th and 10th months respectively [Table 5]. Marital status-wise seropositivity was high in unmarried group (50%) followed by married group (0.36%) and significant with a P value 0.007 [Table 6]. Occupation-wise seropositivity was insignificantly high in daily labourers (0.5%) followed by housewives (0.36%) with a P value 0.96 [Table 7]. Parity-wise seroprevalence was highest in para 3 (8.33%) followed by para 2 (0.75%), nullipara, primigravida (0.39%) and para 1 (0.22%), and was significant with a P value 0.001 [Table 8]. Type of antenatal women-wise seroprevalence was high in those coming directly in labour/delivery (60%) followed by that of those with antenatal care (0.29%) with a significant P value 0.001 [Table 9].

Table 1: Demographic characters of antenatal women attending ICTC in a tertiary care Hospital at Tirupati during 2013-2014

Variables	No. of AW	Percentage of AW	No. of SP	Percentage of SP
Age group (yrs)				
< 20	290	6.9	2	0.69
20-24	2,933	70.1	8	0.27
25-29	843	20.1	4	0.47
30-34	95	2.3	1	1.05
35 & above	26	0.6	0	0.00
Educational status				
Illiterate	391	9.3	3	0.77
Primary	697	16.7	6	0.86
Secondary	1,656	39.6	4	0.24
Collegiate	1,443	34.5	2	0.14

Gestation in lunar months				
0	1	0.02	0	0.00
1	1	0.02	0	0.00
2	37	0.88	0	0.00
3	237	5.66	2	0.84
4	298	7.12	0	0.00
5	837	19.99	1	0.12
6	505	12.06	1	0.19
7	519	12.40	1	0.19
8	433	10.34	1	0.23
9	846	20.21	7	0.83
10	473	11.30	2	0.42
Marital status				
Married	4,185	99.95	14	0.33
Unmarried	2	0.05	1	50.00
Occupational status				
Daily wages	397	9.48	2	0.50
Salaried	145	3.46	0	0.00
Business	10	0.24	0	0.00
Housewife	3,603	86.05	13	0.36
Student	31	0.74	0	0.00
Tailor	1	0.02	0	0.00
Parity status				
Nullipara & Primigravida	2,074	49.53	8	0.39
Para 1	1,835	43.83	4	0.22
Para 2	265	6.33	2	0.75
Para 3	12	0.29	1	8.33
Para 4	1	0.02	0	0.00
Type of subjects				
ANC/OBG/PPTCT	4,182	99.88	12	0.29
Direct labour / delivery	5	0.12	3	60.00

Table 2: Test-result status of the antenatal women

Test-result status	Number of antenatal women	Percentage (%)
Positive	15	0.36
Negative	4,169	99.57
Indeterminate	3	0.07
Total	4,187	100.00

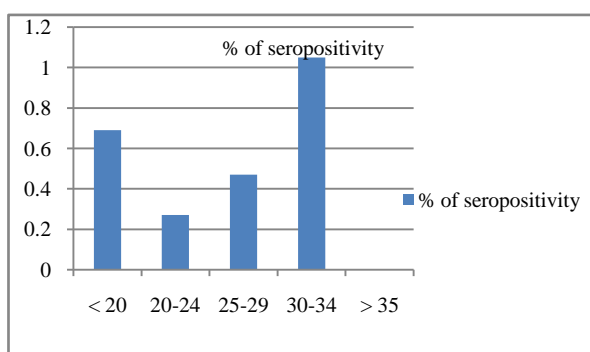
Test result status of the antenatal cases: Negative 99.57%
 Positive 0.36%
 Indeterminate 0.07%

Table 3: Age group by HIV seropositivity

Age group	No. of antenatal cases	HIV seropositive	Percentage (%)
Less than 20 years	290	2	0.69
20-24 years	2,930	8	0.27
25-30 years	843	4	0.47
30-34 years	95	1	1.05
35 years and above	26	0	0.00
Total	4,184	15	0.36

P = 0.53 = NS

Figure 1. Age group-wise HIV seropositivity



< 20 years 0.69%
 20-24 years 0.27%
 25-30 years 0.47%
 30-34 years 1.05%
 > 35 years zero%

Table 4: Educational status-wise HIV seropositivity

Educational status	No. of antenatal cases	HIV sero-positive	Percentage (%)
Illiterate	391	3	0.77
Primary education	696	6	0.86
Secondary education	1,654	4	0.24
Collegeate	1,443	2	0.14
Total	4,184	15	0.36

Primary 0.86%, Illiterate 0.77%, Secondary 0.24%, Collegeate 0.14% P = 0.024 = S

Figure 2. Educational status-wise HIV sero-positivity

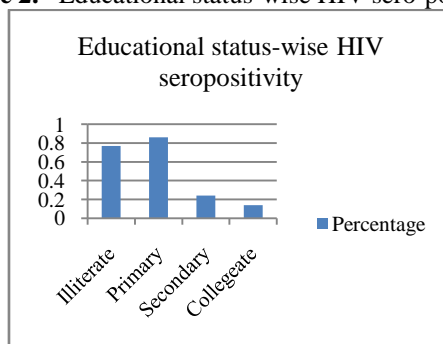


Table 5: Gestation in lunar month-wise HIV seropositivity

Gestation in lunar month	Total subjects	HIV seropositive	Percentage of seropositive (%)
0	1	0	0.00
1	1	0	0.00
2	37	0	0.00
3	237	2	0.84
4	298	0	0.00
5	836	1	0.12
6	505	1	0.19
7	517	1	0.19
8	433	1	0.23
9	846	7	0.83
10	473	2	0.42
Total	4,184	15	0.36

P = 0.41 =NS

Table 6: Marital status-wise HIV seropositivity

Marital status	Total subjects	HIV seropositives	Percentage of seropositives (%)
Married	4,182	14	0.33
Unmarried	2	1	50.00
Total	4,184	15	0.36

P = 0.007 = S

Table 7: Occupational status-wise HIV seropositivity

Occupation	Total subjects	HIV seropositives	Percentage of seropositives (%)
Daily wages	397	2	0.50
Salaried	145	0	0.00
Business	10	0	0.00
Housewife	3,600	13	0.36
Student	31	0	0.00
Tailor	1	0	0.00
Total	1,484	15	0.36

P = 0.96 = NS

Table 8: Parity-wise HIV seropositivity

Parity	Total subjects	HIV seropositive	Percentage of seropositives (%)
Nulliparous	2,073	8	0.39
1	1,833	4	0.22
2	265	2	0.75
3	12	1	8.33
4	1	0	0.00

Total	1,484	15	0.36
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P = < 0.001 = S

Table 9: Type of patient-wise HIV seopositivity

Type	Total subjects	HIV seropositives	Percentage of seropositives (%)
ANC	4,179	12	0.29
Direct labour/delivery	5	3	60.00
Total	4,184	15	0.36

P = < 0.001 = S

IV. Discussion

The prevention and the impact of HIV/AIDS epidemic depend upon the knowledge among people about the disease transmission and on how it can be prevented.⁹ It is utterly important to raise the level of knowledge and awareness about HIV and its ways of transmission especially in low income countries where poverty, lack of education and ignorance co-exist. It therefore requires a great deal of effort to spread the message. India is one of these countries and HIV/AIDS is spreading rapidly and by most heterosexually. It is no longer restricted to high risk behavior groups and the high level of infection among antenatal women indicates that the epidemic is becoming more generalised. India has a burden of 2.5 million people infected with HIV-1 making it the third largest HIV-1 epidemic in the world after Africa and Nigeria. The road from 2.5 million new HIV infections – the number in 2011 – to zero new HIV infection is a long one and there is a significant effort required to accelerate HIV prevention programmes.¹⁰ It is desirable to bring down this rate to remarkable level or even to zero in view of women empowerment and women’s lib as women are making their entry in all fields on par with men for the country’s development and prospects. If we fail, the country may face the consequence that is faced by South Africa today where one out of four pregnant women is infected with HIV.¹¹

In India, poor access to health care system, ignorance of the masses, financial constraints and NACO policy till recently of not screening all the antenatal mothers unless the prevalence rate exceeds one percent in the area may lead to increasing pediatric HIV infections in coming years.¹² The married women in the child bearing age-group is obviously a very vulnerable category because of their low status in the society, and are often ignorant about sex and they have little influence on their husband’s behaviour. That is why correct knowledge and HIV awareness is the most important issue among these women. They must learn how to protect themselves and their babies from this disease. However, there is still a barrier of embarrassment, shyness and socio-cultural beliefs associated with sexually transmitted infections (STIs) and HIV/AIDS that needs to be overcome. Counselling together with HIV testing provides antenatal women with valuable information regarding their HIV status thereby enabling them to utilise the services rendered to either decrease mother to child transmission in case seropositive and prevent future infection in case seronegative as the case may be.

In the present study, 4,187 antenatal cases attending ICTC at a tertiary care referral centre, Tirupati during 2013-2014 were tested for HIV seroprevalence. Three cases with the indeterminate report were eliminated from the study. The study resulted in an overall prevalence of 0.36% (15/1484). Significantly higher prevalence was observed in unmarried group (50.0%), those directly coming for delivery (60.0%), para 3 (8.33%), primary literates (0.86%) and illiterates (0.77%). Insignificantly higher prevalence was found in the 30-34 year age group (1.05%), less than 20 year age group (0.69%), and those engaged as daily labourers (0.50%). Prevalence rates closer to our study in India were reported by Joshi et al. (0.40%)¹³ and Giri et al. (0.41%)¹⁴, higher than this were reported by Dash et al. (0.53%)¹⁵, Mandal et al. (0.56%)¹⁶, Kulkarni et al. (0.76%)¹⁷, Parameswari et al. (0.77%)¹⁸ and Vellanki et al. (1.12%)¹⁹. In contrast, the lower prevalence rate was reported by Chaudhary et al. (0.17%)²⁰. This wide variability in HIV seroprevalence among antenatal women may be attributed to the difference in health seeking and risk behaviours in different parts within and outside India which mostly depends on the sociocultural milieu of the community. In a study done by Narayani B et al, it showed that higher socioeconomic status, literacy and parity of pregnant women were significantly associated with the increase in awareness towards HIV/AIDS²¹. The higher level of education and high socioeconomic status could facilitate the spread of HIV awareness and can increase the use of barrier contraceptives.²² As the HIV testing in India is voluntary testing i.e. not mandatory or strict for every individual in the community, it is a very challenging job to estimate the actual prevalence of HIV among the people who are not attending ICTC or any of the testing centres voluntarily. The prevalence of HIV in our study (0.36%) among the antenatal women attending the ICTC was almost similar in comparison to the prevalence of HIV in adult Indian population i.e. 0.34% (0.25% to 0.43%)²³.

V. Conclusion

The HIV seroprevalence in our study is 0.36% among antenatal women attending ICTC. Among the HIV seropositives in the present study, the majority were in 30-34 year age-group and with primary education. Unmarried group and those with higher parity constitute risk factors for seroprevalence. Hence education, awareness programs of HIV and AIDS should be initiated at the level of upper primary education onwards so that the children would be well aware of its consequences at an adult stage and contribute for the prevention of the disease in the community at their level. In the light of women empowerment and women's lib, the health of women is given utmost importance by the governmental and non-governmental organisations. The combined effects of these would, in turn, develop a healthy society and energetic future generations. HIV/AIDS should be given top priority for prevention and treatment especially in antenatal mothers of all sections of the society to keep up the pride of our country.

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References

- [1]. WHO Progress report (2010). executive summary, HIV/AIDS in the South East Asia region. World Health Organization. p.5 Available from; http://www.searo.who.int/link_files/HIV-AIDS-HIV-report-2010, 30 Nov.
- [2]. Annual Report 2010–2011 [internet]. Government of India:National AIDS Control Organization (NACO). c2007 - [cited 2012 May 28]. Available from: <http://www.nacoonline.org>
- [3]. Kumar R, Jha P, Arora P, Mony P, Bhatia P, Millson P, et al. Trends in HIV-1 in young adults in south India from 2000 to 2004: a prevalence study. *Lancet* 2006; 367:1164-72.
- [4]. Pitkin J, Peattie A, Magowan B (2003). *Obstetrics and Gynaecology: An illustrated colour text*. Churchill Livingstone, London. 16:17.
- [5]. Srikanth P, John TJ, Jeyakumari H, Babu PG, Mathai D, Jacob M, et al. Epidemiological features of acquired immunodeficiency syndrome in southern India. *Indian J Med Res* 1997; 105:191-7.
- [6]. Narain, J.P., Jha, A., Lal, S. and Salunke, S. (1994) Risk Factors for HIV Transmission in India. *AIDS*, 8, S77-S82.
- [7]. F. Dabis, P.Mseliati, D.Dunn et al. *AIDS* 1993;7(8):1139-48.
- [8]. NACO Guidelines, March 2007.
- [9]. Knowledge and awareness of HIV/AIDS among women in India.<http://gateway.nlm.nih.gov/meeting/abstract/ma?f=102254030.html> (Accessed on 19th March, 2014)
- [10]. NACO Annual Report 2011-12.
- [11]. Chaudhuri S, Bose S, Talukdar A, Ghosh US (May/June 2007). Seroprevalence and utilization of therapeutic intervention in PPTCT services in a teaching hospital in Kolkata. *Journal of Obstetrics Gynecology India* Vol 57(3)251-256.
- [12]. Sehgal, S., Datta, U., Arora, S., et al. (2008) Time Trends of Pediatric HIV Infection in North India. *Journal of the Indian Medical Association*, 106, 162-164
- [13]. Joshi U, Patel S, Shah K, Oza U, Modi H. Studying PPTCT Services, Interventions, Coverage and Utilization in India. *J Glob Infect Dis* 2011;3:371-7. <http://dx.doi.org/10.4103/0974-777X.91062>
- [14]. Giri PA, Bangal VB, Phalke DB. Prevalence of HIV among rural pregnant women attending antenatal clinics at Pravara Rural Hospital, Loni, Maharashtra, India. *Int J Health Allied Sci* 2012; 1:13-5.
- [15]. Dash M1, Misra P2, Subudhi K3. Utilization of the prevention of parent-to-child transmission of HIV (PPTCT) services intervention in a tertiary care hospital, Odisha, India. *Bangladesh Journal of Medical Science* Vol. 13 No. 02 April'14.
- [16]. Mandal S, Bhattacharya RN, Chakraborty M, Pal PP, Roy SG, Mukherjee G. Evaluation of the prevention of parent to child transmission program in a rural tertiary care hospital of West Bengal, India. *Indian J Community Med* 2010; 35:491-4. <http://dx.doi.org/10.4103/0970-0218.74352>
- [17]. Kulkarni SK, Doibale MK. Trend of Seroprevalence of HIV among Antenatal Clinic attendees at a tertiary care hospital, Nanded, Maharashtra, India. *International J of Basic and Applied Medical Sciences* ISSN: 2277-2103 (Online) 2013 Vol. 3 (1) January-April, pp 257-262. <http://www.cibtech.org/jms.htm>
- [18]. Parameshwari S, Jacob MS, Vijayakumari J, Shalini D, Sushi MK, Sivakumar M. A Program on Prevention of Mother to Child Transmission of HIV at Government Hospital, Tiruchengode Taluk, Namakkal district. *Indian J Community Med* 2009;34:261-3. <http://dx.doi.org/10.4103/0970-0218.55298>
- [21]. Vellanki VS, Gunti SPS, Prasad VG, Kaul R. Seroprevalence of HIV in women attending the antenatal clinic at KIMS hospital, Narketpally, *Int J Reprod Contracept Obstet Gynecol* 2012;1:17-21.

- [22]. Chaudhuri S, Mundle M, Konar H, Das C, Talukdar A, Ghosh US. Utilization of therapeutic to prevent mother to child transmission of HIV in a teaching hospital in Kolkata, India. *J Obstet Gynaecol Res* 2010;36:619–25. <http://dx.doi.org/10.1111/j.1447-0756.2009.01161.x>
- [23]. Narayani B. H, Shakuntal. “Effectiveness of Teaching Programme on Knowledge, Attitude and Practices Regarding The HIV/AIDS Among Pregnant Women In Lady Goshen Hospital, Mangalore – Karnataka”. *Journal of Evolution of Medical and Dental Sciences*/Volume 2/ Issue 25/ June 24, 2013.
- [24]. Glynn JR, Caraël M, Buvé A, Anagonou S, Zekeng L, Kahindo M, et al. Does increased general schooling protect against HIV infection? A study in four African cities. *Trop Med Int Health* 2004;9:4-14. <http://dx.doi.org/10.1046/j.1365-3156.2003.01168.x>
- [25]. Madkar, S.S., Nilekar, S.L. and Vankudre, A.J. (2011) Prevalence of HIV Infection among Persons Attending Integrated Counseling and Testing Centre, Ambajogai. *National Journal of Community Medicine*, 2, 213-215.

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