MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2024.2.361.364

OPEN ACCESS

Key Words
HIV seroprevalence, national AIDS control programme, antenatal women, Himachal Pradesh

Corresponding Author
Praveen Kumar Shukla,
Department of Dermatology, Dr YSPGMC Nahan HP, India
praveenshukla34@gmail.com

Author Designation
[1]Assistant Professor
[2,4]Senior Resident
[3]Junior Resident

Received: 24 December 2023
Accepted: 18 January 2024
Published: 23 March 2024

Citation: Ajay Kumar, Jyotshna Sharma, Manisha Chandel and Praveen Kumar Shukla, 2024. Seroprevalence of Human Immunodeficiency Virus in Pregnant Women Vis a Vis Impact of National AIDS Control Programme: A Hospital Based Study. Res. J. Med. Sci., 18: 361-364, doi: 10.59218/makrjms. 2024.2.361.364

Seroprevalence of Human Immunodeficiency Virus in Pregnant Women Vis a Vis Impact of National AIDS Control Programme: A Hospital Based Study

[1]Ajay Kumar, [2]Jyotshna Sharma, [3]Manisha Chandel and [4]Praveen Kumar Shukla

[1,2,4]Department of Dermatology, Dr YSPGMC Nahan HP, India
[3]Department of OBG and Gynecology, ABVIMS and Dr RML Hospital, India

ABSTRACT
The prevalence of HIV infection in India has been a significant public health concern, with the National AIDS Control Programme (NACP) implemented in 1992 to combat the epidemic. This hospital-based study aims to assess the seroprevalence of HIV in pregnant women, serving as an indicator of the general population's HIV infection status and to evaluate the impact of NACP. Antenatal mothers from a tertiary care hospital in Himachal Pradesh, India, were included in this retrospective study. Data were collected from antenatal mothers attending the Integrated Counseling and Testing Centre and STI clinic Routine antenatal care services were provided, including HIV testing according to National AIDS Control Organization (NACO) guidelines. Data from 2016 to 2020 were collected and analyzed. Out of 7,381 antenatal women screened, only three were found seropositive, resulting in a seroprevalence of 0.04%. The majority of the screened women were in the 25-34 years age group and most testing occurred during the first and second trimesters. Seropositivity was higher in the 15-24 years age group and more frequent in the first trimester. All seropositive women were primigravida. Two of the three seropositive women delivered full-term live births. The study revealed a decreasing trend in HIV seropositivity among antenatal women, indicating the effectiveness of NACP and targeted interventions. Screening and raising awareness among adolescent females are crucial for preventing mother-to-child transmission and controlling the epidemic, especially in low prevalence areas.

INTRODUCTION

The AIDS being the one of the leading cause of morbidity and mortality in the developing nations and prevalence of HIV infection has decreased since the inception of National AIDS Control Programme (NACP) in the year 1992 in India . The HIV epidemic monitoring has been the important component of strategic information which is required for assessment of NACP. The first case of HIV infection in India was reported from Chennai in 1986[1]. The most HIV infections are caused by the type 1 virus (HIV 1)[2,3]. In 1992 the perinatal transmission of HIV was reveled[4] and transmission through breast milk was proposed in 1995[5]. The transmission risk in the absence of intervention was 15-25% in developed countries and 20-45% in South East Asian nations[6]. India being a low prevalence country for HIV with less than 1% seroprevalence among adult population.

In 2019, there were an estimated 23.49 lakh people living with HIV in India (PLHIV), with an adult HIV prevalence of 0.22% (0.17-0.29%) and 3.4% are the children living with HIV of total PLHIV estimates[7]. HIV infected women above 15 years constituted around 44% of the total estimated PLHIV. There were 69.22 thousand new HIV infections in 2019 which has declined by 37% since 2010 and by 86% since reaching the peak in 1997[7].

The antenatal mothers comprise a low risk population and the seroprevalence in this group considered as the indicator of HIV infection in general population and also to predict seroprevalence in young children. HIV infection in women is associated with low birth weight[8], 30% decrease in fertility[9], chorioamnionitis[10] and five fold increase in maternal mortality[11]. The transmission occur during intrauterine life, child birth and breast feeding, so screening at the first visit or early stage of gestation will definitely reduce the burden of HIV disease. The significant impact of universal screening of both pregnant mother and partner will detect the unrecognized cases to formulate treatment and reduce the morbidity, mortality and transmission of infection in future.

We undertook a 5 years retrospective study from year 2016 to 2020 to determine the HIV seroprevalence among pregnant mothers and impact of NACP from a tertiary care hospital and medical collage, as no such study was conducted and none indicating trends from this geographical location.

MATERIALS AND METHODS

Study Design: This was a retrospective study conducted over a 5-year period, from January 2016 to December 2020. The study aimed to assess the seroprevalence of Human Immunodeficiency Virus (HIV) among pregnant women and evaluate the impact of the National AIDS Control Programme (NACP) at a tertiary care hospital and medical college in Nahan, Himachal Pradesh, India.

Study Subjects: The study included antenatal mothers who were attending the Integrated Counseling and Testing Centre and the STI clinic at the medical college. All pregnant mothers registered with these healthcare facilities were included in the study.

Antenatal Care Services: Antenatal care services provided to the participants included routine blood examination, serological testing for syphilis and HIV testing. HIV screening and diagnosis were performed following the guidelines set by the National AIDS Control Organization (NACO) in India.

Data Collection: Data were collected from January 2016 to December 2020.The study's data was primarily sourced from laboratory logbooks and antenatal HIV reports, which were reviewed and analyzed.

Statistical Analysis: The data collected for the study was subjected to statistical analysis using Epi info version 7 software.

Ethical Considerations: The study adhered to ethical guidelines and maintained the privacy and confidentiality of the participants' medical information.

RESULTS

The data was collected and analyzed from the total of 7381 antenatal women from January 2016 to December 2020 who were screened for HIV status and three were found seropositive. The seroprevalence of HIV reactive women in the study was 0.0%, 0.14%, 0.06%, 0.0%, 0.0% from the year 2016 to 2020 respectively (Fig. 1) (Table 1). The seroprevalence of 0.04% (3/7381) were observed over a period of five years. The spouse positivity was noted in 2 males (66%) of the seropositive antenatal women. The majority of antenatal females screened (44.8%) were in the age group of 25-34 years followed by 15-24 years (33.3%) and (21.7%) in more than 35 years (Table 2).

The number of females tested for HIV antibodies during first, second, third trimester were 38.8%, 43.1%, 17.9%, respectively. The two (2/2868) antenatal mothers was found seropositive in first trimester and one (1/ 3185) in second trimester. The ODD's Ratio in first trimester was 3.14(0.28-34.74) (Table 3). Of the total antenatal HIV positive women, two were primigravida and one was multigravida. The risk ratio in primigravida is 1.63 (0.14-18.04). The pregnancy outcome of 3 seropositive antenatal women, two delivered full term live birth and one was lost to follow up.

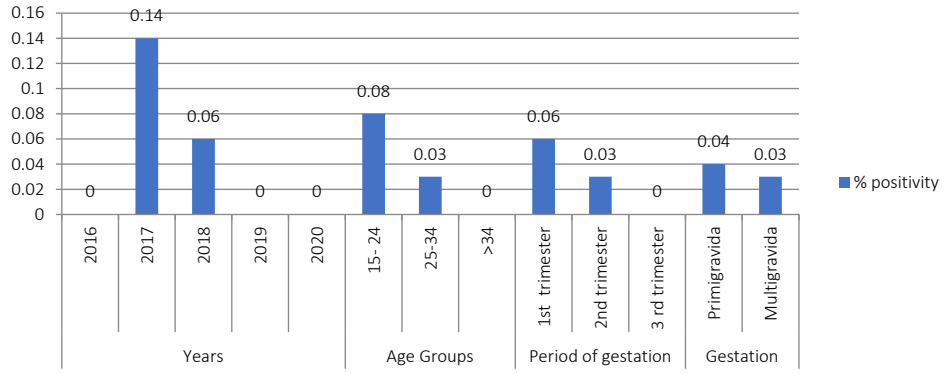

Fig. 1: Sero-prevalence of HIV reactive women in the study across different variables

Table 1: Year-wise HIV seroprevalence among antenatal women

Year	Seropositive (n = 3)	Total tested (n = 7381)	Positivity (%)
2016	0	1419	0
2017	2	1334	0.14
2018	1	1648	0.06
2019	0	1381	0
2020	0	1599	0

Table 2: HIV Seropositivity among the age groups

Age group (Years)	Seropositive (n = 03)	Total tested (n = 7381)	Positivity (%)
15- 24	02	2460	0.08
25-34	01	3313	0.03
>34	0	1608	0

Table 3: HIV seropositivity and period of gestation

Period of gestation	Seropositive (n = 03)	Total tested (n = 7381)	Positivity (%)
1st trimester	02	2868	0.06
2nd trimester	01	3185	0.03
3 rd trimester	0	1328	0

Table 4: Seropositivity and gestation

Gestation	Seropositive (n = 03)	Total tested (n = 7381)	Positivity (%)
Primigravida	02	4059	0.04
Multigravida	01	3322	0.03

DISCUSSION

The well being of women is the key to healthy society, so early and timely intervention is the preventive approach to curb the HIV epidemic. As women are biological more susceptible to HIV infection and infection has spread from high risk group to general population and from urban to rural regions[12]. The recommendations for universal screening for HIV in pregnancy leading to early detection, initiation of ART or as prophylaxis for prevention of mother to child, elective cesarean section and complete avoidance of breast feeding is not feasible in resource limited countries.

India has the third largest number of people living with HIV/AIDS and slight increase in the newly acquired infection will turns into epidemic or vice versa. The strategy of early intervention to prevent vertical transmission of HIV infection has reduced the incidence of new infections and impact is visible at national level. The annual new HIV infections have decreased by 37% since 2010[7]. The efforts of NACP IV focusing upon the trend of reversal of epidemic seen at national level to all the key districts in India and the same trend was observed in present study.

The seroprevalence of HIV reactivity in antenatal women in this study was 0.04% and similar results of low prevalence of 0.1% (1/1563) was found in the study by Ray *et al*.[13]. The six year retrospective study from Himachal Pradesh conducted by kumar et al found low HIV seropositivity of 0.03% (13/33271) in the pregnant women[14]. The study conducted on prevention of parent to child transmission service delivery in 2008 by Sinha and Roy showed 0.74% (5/669) HIV positive women[15]. The study conducted by Pallikadavath et al from the north Indian married women regarding the awareness of HIV was higher in the 15-24 years age group as compared to the older women[16]. The present study showed that newly sexually active pregnant female in age group of 15-24 years are most affected similar to study conducted by Ukey *et al*.[17] from western India. In present study two females were seropositive in first trimester with Odd's ratio 3.14 (.28-34.74) and one in second trimester with spouse positivity and risk ratio in primigradva is 1.63 (0.14-18.04) which implies that mandatory antenatal screening in first trimester and emphasis upon shifting the target intervention to adolescent unmarried females is important in ending the AIDS epidemic as a public health threat by 2030.

India biennially undertakes HIV estimation and projection exercises for planning processes to provide update on status of HIV epidemic by states/UT. India response to HIV/AIDS has been successful and the elimination of mother to child transmission of HIV and Syphilis has to be achieved by 2020 as per the national and global commitments.

CONCLUSION

In conclusion, this retrospective hospital-based study conducted over a five-year period in Himachal Pradesh, India, reveals a promising decline in HIV seroprevalence among antenatal women, reflecting the effectiveness of the National AIDS Control Programme (NACP) and targeted interventions. With

only a 0.04% seroprevalence, it is evident that HIV does not pose a significant threat to pregnant women in this region. The study emphasizes the importance of early antenatal screening, particularly in the 15-24 years age group, underlining the need for awareness and intervention among sexually active adolescent females. The study's encouraging pregnancy outcomes and alignment with national trends showcase the progress in reducing new HIV infections and the potential to curtail the epidemic. Ongoing implementation of the National Strategic Plan for HIV/AIDS and STI remains crucial, emphasizing the prevention of mother-to-child transmission, especially in low-prevalence areas.

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