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Research Article

# HISTORICAL STUDY ON HIV SEROPREVALENCE AMONG VOLUNTARY BLOOD DONORS ATTENDING BLOOD DONATION CAMPS IN SANGLI DISTRICT, MAHARASHTRA

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## ABSTRACT

**Context:** Blood transfusion is a life saving intervention. Sero-surveillance of blood donors provides a very useful data in the form of feedback essential for successful planning and implementation of National AIDS Control Programme. The present study depicts the HIV/AIDS scenario in one of the worst affected districts way back in 1999 when the study was undertaken and compares with the current scenario. It helps us in understanding the changing trends in epidemiology of HIV/AIDS after many control measures were undertaken by NACO.

**Objective:** To study the sero-prevalence of HIV among voluntary blood donors attending blood donation camps.

**Methods:** The study presents the historical data collected 1<sup>st</sup> May 1998 to 4<sup>th</sup> February 1999 from 49 blood donation camps organized by the Blood Bank at General Hospital, Sangli District. Total 1231 blood donors volunteered to participate in the study. HIV antibody screening was done as per the NACO guidelines.

**Results:** The overall HIV sero-prevalence among the blood donors was 5.2%. The socio-demographic characters like age, gender, religion, occupation and residence did not show significant association with HIV positivity among blood donors. The only variables to be significantly associated were educational and marital status. HIV sero-prevalence among blood donors shows a sharp decline from 5.2% in present study to 0.57% in 2008. **Conclusion:** Screening of donated blood for TTIs is one of the important parameters for blood safety. The figures can be attributed to the success of various interventions done for prevention and control of HIV/AIDS in India and particularly in Sangli District.

**Keywords:** HIV sero-prevalence, ELISA, Blood donor, Voluntary, Trends, TTIs.

## INTRODUCTION

Blood transfusion is a life saving intervention and Voluntary Blood Donation programme is the foundation for safe and quality Blood Transfusion Service. The blood collection from voluntary non-remunerated blood donors is considered to be the safest. Voluntary blood donors are the cornerstone of a safe and adequate supply of blood and blood products. Timely transfusion of blood saves millions of lives, but unsafe transfusion practices puts millions of people at risk of transfusion transmissible infections (TTIs)<sup>1</sup>. Use of unscreened blood transfusion keep the patient at risk of acquiring many TTIs like hepatitis viruses (HBV, HCV), human immune deficiency viruses (HIV), syphilis, malaria etc. The risk of transmission of TTIs still remains a

major concern due to the factors such as blood donations during the window period, emergence of newer transmissible pathogens, and prevalence of asymptomatic carriers pose a serious challenge to blood safety<sup>2,3</sup>. Blood banks and transfusion departments have always been a major portal to screen, monitor and control infections transmitted by blood transfusion. Today blood banks not only screen TTIs but also give clue about the prevalence of these infections in healthy populations<sup>4</sup>. Sero-surveillance of blood donors provides a very useful data in the form of feedback essential for successful planning and implementation of National AIDS Control Programme (NACP). In 1993 based on information from 243 AIDS cases, National AIDS Control Organization (NACO) estimated that 13 % of HIV transmission was through transfusion of infected blood and blood products which fell to

2% in 2005<sup>5</sup>. In 1998, Maharashtra was one of the worst hit states due to HIV with the ELISA reactivity rate among blood donors to rise from 0.6% in 1990 to 1.4% by 1998. The highest rate of HIV seroprevalence in blood donors between April to August 1994 was seen in Sangli District (5.78%) and lowest rate in Sindhudurg District (< 0.5%)<sup>6</sup>. The Sangli District had a high HIV seroprevalence inspite of mandatory HIV screening of all blood units since 1989 by Government of India indicating a high prevalence in general population. The present study depicts the HIV/AIDS scenario in one of the worst affected districts way back in 1998 when the study undertaken and compares with the current scenario. It helps us in understanding the changing trends in epidemiology of HIV/AIDS after many control measures were undertaken by NACO. The present study shall give us an insight into the historical data collected during 1998 from voluntary blood donors attending blood donation camps in a highly prevalent district of Maharashtra.

## MATERIALS AND METHODS

The present study presents the historical data collected during the period from 1<sup>st</sup> May 1998 to 4<sup>th</sup> February 1999. During this period, 49 blood donation camps were organized by the Blood Bank at General Hospital, Sangli District. 24 of these camps were conducted in the area of Sangli-Miraj-Kupwad Municipal Corporation. Remaining 25 camps were organized in all talukas of the district, except Jath taluka. Each donor was informed about the purpose of the study and information was collected from voluntary blood donors attending these camps. The camps were organized by different social organizations, educational institutions, political organizations etc. All the blood camps were attended and detailed information of every blood donor was recorded by an interview after informed written consent from participants. Only those donors who qualified as healthy blood donors were included. The donors who were disqualified due to the exclusion criteria such as age, underweight, Hb level, history of blood donation in the last 3 months and others were not included in the study. All the participants were assured of confidentiality after which 1231 blood donors volunteered to participate in the present study. 11 participants refused to participate out of total 1242 donors approached during the study period. The participants were interviewed using a pre-tested questionnaire. Blood bank staff assigned a code number to each blood unit after collection. This code number was recorded on the interview proforma so as to correlate the laboratory test results with the socio-demographic information without affecting the confidentiality of the donors. The collected blood units with pilot tubes were transported to the blood bank in cold storage. The routine mandatory tests for HBsAg, VDRL, HIV and Blood Grouping were carried out in next two days and the results were registered carefully in the register. HIV antibody screening (RECOMBIGN HIV-1/HIV-2 EIA test) was done as per the NACO guidelines<sup>7</sup>. The blood samples were tested for HIV by single ELISA test using RECOMBIGN HIV-1/HIV-2 EIA. A single ELISA test is deemed as most cost effective, highly sensitive, rapid and cheap<sup>8,9</sup>. This study presents the context of HIV status of

donors as a source of HIV sero-surveillance data and implications for further research on its epidemiology.

## RESULTS

The present study contains the analysis of the HIV status of blood donors with special reference to the socio-demographic characteristics. Testing for HIV is more than a mere biological test, for it involves ethical, human and legal dimensions. A total of 1231 subjects participated in the study. The socio-demographic profile of the blood donors participated in the study is shown in table 1. Major proportion of blood donors (54%) comprised of young adults between 18 to 20 years. The reason being that 7 out of total 49 camps were held in various educational institutions and youth camps. Only 3.3 % of donors were females, while 96.7% were males. 58% of blood donors belonged to rural area while remaining 42% belonged to urban area. The residence of donors was mainly dependent upon the places where the concerned blood camps were held and may not reflect any meaningful information. Majority of donors belonged to Hindu religion. Only 0.4% illiterates were the voluntary blood donors in the present study. Also 48.4% donors were students presenting themselves at blood donation camps. Low percentage of housewives as voluntary blood donors is a very common experience as seen in the present study. With regards to marital status, 19% (235) were married, while 80.8% (993) were unmarried. Only 3 subjects were widowers.

The overall HIV antibody test positivity was 5.2% in the study. Among them 4.6% were positive only for HIV and remaining 0.6% positive for both HIV and HBsAg. HIV seropositivity rate was highest in the age group above 41 years and lowest in the age group below 20 years. This difference was not statistically significant. The socio-demographic determinants of HIV seropositivity among blood donors is shown in table 2. The gender wise distribution of HIV seropositivity was also not statistically significant. The HIV seropositivity was 4.9% in rural donors and 5.6% in urban donors. This observed difference was statistically not significant. Also it was seen that the religion of the donor did not have any effect on HIV positivity pattern and is more dependent on the human behavior. The HIV positivity was high among those educated upto secondary level (8.3%) as compared to those educated above secondary level (3.7%). This observed difference was found to be statistically significant. Though the HIV positivity was high among those employed in service (6.1%) and have own business (7.5%) than others, but was not statistically significant. The marital status of the donors showed a very higher prevalence among widowers and this difference was statistically significant indicating a high risk behavior among them.

The high prevalence found in this historical study done in 1998-99 reflects the situation of HIV infection in one of the worst affected district of Maharashtra second to Mumbai. These figures tipped the health authorities to undertake aggressive prevention and control methods for HIV/AIDS in the district. By 2010, the district has 20 integrated counselling and testing centres (ICTCs), 2 sexually transmitted diseases (STD) clinics, 9 blood banks, 2 community care centres

(CCCs), 2 ART Centres and 4 Link-ART Centres. The trends of HIV seropositivity among voluntary blood donors as shown in figure 1 indicates a significant decline due to various interventions undertaken in the district.

## DISCUSSION

Screening of donated blood for TTIs is one of the important parameters for blood safety. The present historical study establishes a high prevalence of HIV infection among voluntary blood donors attending blood camps in Sangli District. The overall HIV seroprevalence was 5.2%. The transfusion-related HIV/AIDS has gone down from 16% - end November 1994 to 3% - end November 2002 due to compulsory blood screening for HIV for over a decade. The recent figures from Sangli District show the HIV seroprevalence among blood donors to be 0.57% (Confidence Interval: 0.40-0.65) as per the data for 2008<sup>10</sup>. This shows a sharp decline in the seroprevalence since the present study was undertaken in 1999. These figures can be attributed to the success of various interventions done for prevention and control of HIV/AIDS in India and particularly in Sangli District. Drivers of the epidemic in the district is an established HIV transmission among the general population through the large local network of clients of female sex workers (FSWs), female sex workers and men who have sex with men. Moreover, there is an inflow of migrant FSWs from North Karnataka into Sangli district. A slow and steady increase of HIV incidence in voluntary blood donors (from 1.6 per 1 000 in 1988-1989 to 3.8 per 1 000 in 1996-1997) was noted in Vellore similarly found in Sangli District<sup>11</sup>. The prevalence of HIV among the Indian blood donors is reported to be ranging as 0.084% to 3.87% and is lower than the present historical study<sup>12-15</sup>. Another recent study done in 2012, shows a prevalence of 0.1% among the blood donors in Uttar Pradesh<sup>16</sup>.

The most commonly affected age group is the sexually active and economically active age group between 20-40 years of age. Similar findings were seen in the present study which is in agreement with other authors<sup>17,18</sup>. The prevalence of HIV was almost same in the donors from rural as well as urban area in the present study. The infection has spread from urban to rural area. This has important implications as the District health authorities have to implement HIV interventions in both places. The present study also highlighted that instead of religion, it's the high risk behavior of a person makes him more at risk of acquiring HIV/AIDS<sup>19</sup>. The gender distribution also shows similar seroprevalence of HIV among both sexes. Since only 41 donors were females, the results may be inconclusive. Education and awareness of people about HIV/AIDS is being done by giving significant weightage to behavior change communication in the programme. Hence the educational level can have a beneficial effect by reducing the possibilities of HIV related high risk behavioural patterns. Low educational status was significantly associated with seropositivity among voluntary blood donors in Solapur District of Maharashtra<sup>17</sup>. Similar findings were noted in the present study. It is reported that certain occupations have been associated with high risk behavior leading to a higher

prevalence of HIV/AIDS among them. From the present study it was evident that all the three groups as per marital status might have indulged in HIV related high risk behavior. McFarland et. al have observed HIV seropositivity to be more common among unmarried donors<sup>20</sup>. The weakness of the data sources as blood bank are that the risk profile of tested individuals is not known and the individuals tested often tend to be sexually less or not active, particularly among the voluntary blood donors in a camp setting. But still the data from blood donors give valuable information about the trends of HIV epidemic in general population. If we compare the study findings of this historical study, we can conclude that the HIV seroprevalence has declined very much and minimized the transfusion related risk of HIV infection among the blood recipients. The NACO suggested an overall prevalence of 0.91% (2005) in India with 0.25% in Delhi<sup>21</sup>. The prevalence of HIV in various parts of India is different with high rate in western and southern parts<sup>22</sup>. The present historical study done in 1999 clearly documents a very high seroprevalence (5.2%) of HIV among voluntary blood donors of Sangli District. Moreover our study when compared with the data from recent studies and a report from Sangli District reveal the declining trend of HIV in our region and it is found to be relatively rare when compared with other.

## CONCLUSION

Recruitment of safe donors is a challenging task. It is necessary that people realize that blood donation is their responsibility. The socio-demographic characters like age, gender, religion, occupation and residence did not show significant association with HIV positivity among blood donors in the present study. The only variables to be significantly associated were educational and marital status. This can be attributed to more ignorance about HIV/AIDS among less literate and indulging into HIV related high risk behavior by them and by unmarried and widowers. The recruitment of donors becomes one of the most important aspects of Blood Transfusion Services. Thus, healthy, responsive and motivated voluntary blood donors are the back-bone of any service. A key aspect of ensuring a safe blood supply is the screening and counselling of donors to limit the number of people infected with HIV from donating

## REFERENCES

1. Bihl F, Castelli D, Marincola F, Dodd RY, Brander C. Transfusion transmitted infections. *J Trans Med.*2007; 5: 25.
2. Ekadashi R, Langer S. Seroprevalence of Human Immunodeficiency Virus and Syphilis in blood donors of Delhi. *Indian J Med Microbiol* 2009; 27: 167-168.
3. Srikrishna A, Sitalakshmi S, Damodar P. How safe are our safe donors? *Indian J Pathol Microbiol* 1999; 42: 411-416.
4. Khan ZT, Asim S, Tariz Z, Ehsan IA, Malik RA, Ashfaq B et al. Prevalence of Transfusion transmitted infections in healthy blood donors in

- Rawalpindi District, Pakistan—a five year study. *Int J Pathol* 2007; 5:21–25
5. Mariette Correa, David Gisselquist. HIV from blood exposure in India-An exploratory study. *NCA South Asia*. Colombo. 2005.
  6. Salunke SR. HIV infection and AIDS- Global Scene. *Indo-US CME Programme. HIV/AIDS Update*, 1994: 11-15.
  7. Government of India. Training Module on HIV infection and AIDS for Mid-Level Managers. Director of Health Services Maharashtra State. NIHFWS, New Delhi, Government of India; 1995.
  8. Bhatia and Ichupujani. *Essentials of Medical Microbiology*. 1<sup>st</sup> Edition; 1994, Jaypee Brothers: 592-95.
  9. Meda N and et.al. Serological diagnosis of HIV in Burkino Faso. *WHO Bulletin* 1999; 77 (9): 731-40.
  10. Sawant V, Ghule NL, Ramesh BM, Gaikwad A, Harangule S, Dhamne S. HIV/AIDS situation and response in Sangli District: Epidemiological appraisal using data triangulation. *India Health Action Trust, Bangalore*; 2011.
  11. Rose D, Sudarsanam A, Padankatti T, Babu PG, John TJ. Increasing prevalence of HIV antibody among blood donors monitored over 9 years in one blood bank. *Indian J Med Res* 1998; 108:42-4.
  12. Chatteraj A, Bhel R, Kataria V. Infectious disease markers in blood donors. *Med J Armed Forces India* 2008; 64(1):33-5.
  13. Gupta N, Vijay Kumar, Kaur A. Seroprevalence of HIV, HBV, HCV, and Syphilis in voluntary blood donors. *Indian J Med Sci* 2004; 58:255-7.
  14. Garg S, Mathur DR, Garg DK. Comparison of seropositivity of HIV, HBsAg, HCV and syphilis in replacement and voluntary blood donors in Western India. *Indian J Pathol Microbiol* 2001; 44:409-12.
  15. Giri PA, Deshpande JD, Phalke DB, Karle LB. Seroprevalence of transfusion transmissible infections among voluntary blood donors at a tertiary care teaching hospital in rural area of India: *J.Fam. Med. Primary Care* 2012; 1:48-51
  16. Agrawal VK, Sharma VP, Agrawal P, Gupta D. Seroprevalence of transfusion transmissible infections among blood donors in urban area. *Asian J Med Res* 2012; 1(3): 112-14.
  17. Kandle SK and et.al. Behavioural risk factors for acquisition of HIV infection in Voluntary blood donor in Solapur (South central Maharashtra). *The Indian Practitioner* 1998; 51 (5): 359-62.
  18. Singh YN and et. al. HIV infection in the blood donors of Delhi, India. *J. of Acquired Immune Def. Syndromes* 1990; 3: 152-54.
  19. Kapoor S and et.al. Incidence of HIV infection and its predictors in blood donors in Delhi. *Indian Journal of Medical research* 1998; 108: 45-50.
  20. McFarland W and et.al. Risk factors for prevalent and incident HIV infection in a cohort of voluntary blood donors in Harare, Zimbabwe: Implications for blood safety. *East Afr.Med.J.*1997; 74 (4): 213-16.
  21. Pahuja S, Sharma M, Baitha B, Jain M. Prevalence and trends of markers of hepatitis C virus, hepatitis B virus and human immunodeficiency virus in Delhi blood donors. A hospital based study. *Jpn J Inf Dis*2007; 60:389–391
  22. Singh B, Verma M, Kotru M, Verma K, Batra M. Prevalence of HIV and VDRL seropositivity in blood donors of Delhi. *Indian J Med Res* 2005; 122:234–236

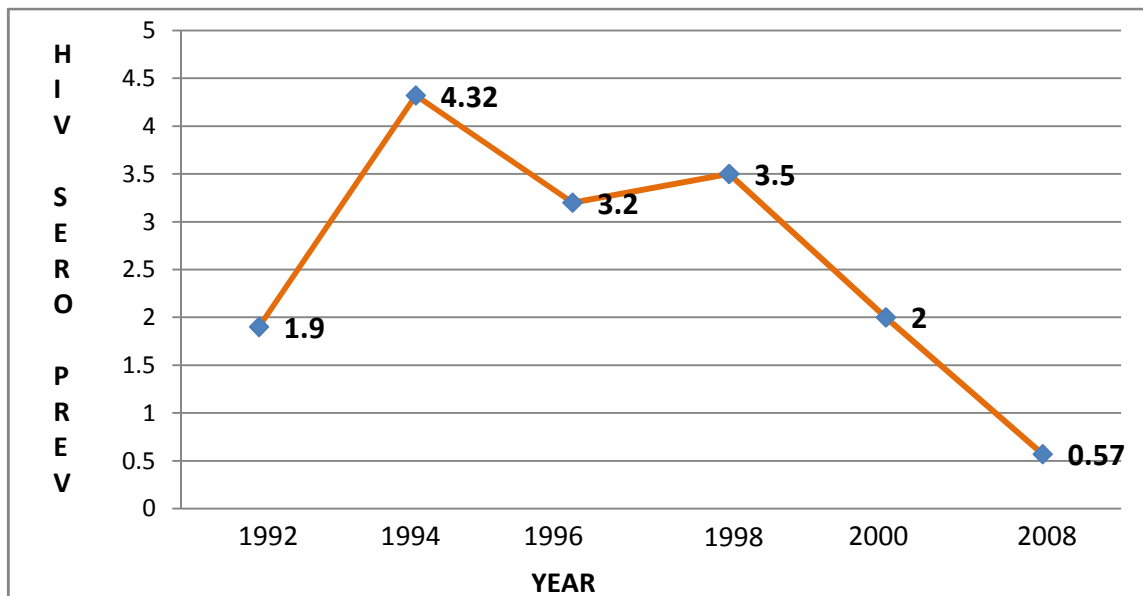


Figure 1: Shows the trends in HIV sero-prevalence among blood donors in Sangli District

**Table 1: Distribution of subjects by socio-demographic characteristics**

Variable	N (%)
<b>Age in Years</b>	
18-20 years	664 (54.0)
21-30 years	421 (34.2)
31-40 years	114 (09.2)
> 41 years	32 (2.6)
<b>Gender</b>	
Male	1190 (96.7)
Female	41 (3.3)
<b>Religion</b>	
Hindu	1134 (92.1)
Non-Hindu	97(7.9)
<b>Educational status</b>	
Illiterate	5 (0.4)
Primary	30 (2.4)
Secondary	379 (30.8)
Higher Secondary	627 (49.6)
Graduate & Above	190 (16.8)
<b>Occupational status</b>	
Student	596 (48.4)
Service	330 (26.8)
Business	239 (19.4)
Unemployed	45 (3.7)
Housewife	21 (1.7)
<b>Marital status</b>	
Married	235 (19.0)
Unmarried	993 (80.8)
Widow	03 (0.2)
<b>Rural/Urban</b>	
Rural	714 (58.0)
Urban	517 (42.0)

**Table 2: Socio-demographic determinants of HIV seropositivity among blood donors**

Variable	ELISA Report		$\chi^2$	P value
	HIV + ve	HIV - ve		
<b>Gender</b>				
Male	62 (5.2)	1128 (94.8)	0.009	> 0.05
Female	02 (4.9)	39 (95.1)		
<b>Age in years</b>				
< 20	27 (4.1)	637 (95.9)	4.31	> 0.05
21 – 40	34 (6.4)	501 (93.6)		
> 41	03 (9.4)	29 (90.6)		
<b>Rural/Urban</b>				
Rural	35 (4.9)	679 (95.1)	0.30	> 0.05
Urban	29 (5.6)	488 (94.4)		
<b>Religion</b>				
Hindu	60 (5.3)	1074 (94.7)	0.24	> 0.05
Non-Hindu	04 (4.1)	93 (95.9)		
<b>Educational Status</b>				
Illiterate	0 (0.0)	5 (100.0)	12.18	< 0.01 <sup>†</sup>
Upto Secondary School	34 (8.3)	375 (91.7)		
Above Secondary School	30 (3.7)	787 (96.3)		
<b>Marital Status</b>				
Unmarried	47 (4.7)	946 (95.3)	6.49	< 0.05*
Married	16 (6.8)	219 (93.2)		
Widow	01 (33.3)	02 (66.7)		
<b>Occupational Status</b>				
Student	23 (3.9)	573 (96.1)	5.36	> 0.05
Service	20 (6.1)	310 (93.9)		
Business	18 (7.5)	221 (92.5)		
Unemployed+ Housewife	03 (4.5)	63 (95.5)		

\* Significant, † Highly significant, figures in bracket indicate percentage

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