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Research Article

SEROPOSTIVITY OF TRANSFUSTION TRANSMISSIBLE HIV INFECTIONS AMONG VOLUNTARY AND REPLACEMENT BLOOD DONORS

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ABSTRACT

Background: The evaluation of the data of the prevalence of transfusion transmissible infections (TTI) among blood donors permits an assessment of the acqisition of the infections in the blood donor population and consequently safety of the collected donations. It also gives an idea for the epidemiology of these infections in the community.

Objectives: To find seropositivity of HIV, in voluntary and replacement blood donors in S.N. Medical college. and H.S.K.Hospital blood bank Bagalkot.

1. To compare seropositivity of HIV, among voluntary and replacement blood donors.
2. To know demographic profile of donors with respect to age and sex.

Methods: The descriptive study included all the blood donors at blood bank, S.N.Medical College and H.S.K. Hospital blood bank Bagalkot, from duration of one year from July 2012 to June 2013.

1. Total of 8187 units of blood were collected from voluntary and replacement donors during the study period.
2. As per NACO guidelines, mandatory screening tests. Were carried out on all the blood samples .for HIV.

Results: Out of the total 8187 blood donors, replacement donors were 7461 (91.13%) compared to voluntary donors 726 (8.87%). The seroprevalence of TTI was 3.51% in total donors. The seroprevalence of HIV was 0.39% in total donors. One voluntary donor was found to be positive for HIV.

Donors were in the age group of 18 to 60 years, with majority in the age group of 18 to 35 years constituting (73.96%). In our study Male donors constituted 7974 (97.39%), and female donor (2.61%) respectively.

Conclusion: The prevalence of transfusion transmissible infections was more in replacement donors compared to voluntary donors. Hence, more emphasis should be given to motivation of voluntary donors.

Key Words: Seroprevalence of HIV; Transfusion transmissible HIV infections; Voluntary donors; Replacement donors.

INTRODUCTION:

Blood transfusion involves transfer of biological material from man to man. Many infectious diseases are likely to be transmitted by blood transfusion.[1] Transfusion transmissible infectious agents such as (TTIS) human immunodeficiency virus (HIV), among the greatest threats to blood safety for recipient . Safe blood and blood products should be offered to all patients in need of transfusion.

The goal of safe affordable blood supply that can meet the growing global demands may be reached by coordinated optimization of each step in the transfusion chain including the careful consideration of donor eligibility criteria, adherence to rigorous rules during donation, processing and storage, the optimal implementation of available. Screening tests, the use of suitable pathogen inactivation methods and finally the vigilance of prudent physicians, who evaluate the necessity of each transfusion Preventing transmission of these infectious diseases through blood transfusion presents one of the greatest challenges of transfusion medicine.

According to NACO guidelines, all mandatory tests should be carried out on donors blood samples for human immunodeficiency virus (HIV). The whole blood or components from any unit that tests positive should be discarded.[2]

The evaluation of the data of the prevalence of the transfusion transmitted infections (TTIS), Human immunodeficiency virus (HIV), among blood donors permits an assessment of the acquisition of the infections in the blood donor population and consequently the safety of the collected donations. It also gives an idea for the epidemiology of these infections in the community.[3]

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Voluntary non-remunerated blood donation is the source of the safest blood supply to the transfusion service. In the Indian setup where voluntary donations are fewer and poorly structured, safety of blood could still compromised.4Infectious agents that pose a serious threat to transfusion recipients are those that persist in the circulation of asymptomatic individuals who are healthy enough to be blood donors.[4]

Hence this study is undertaken to find out the Seroprevelence of transfusion transmissible infections among voluntary and replacement blood donors.

OBJECTIVES

1. To find seropositivity of HIV in voluntary and replacement donors in S. Nijalingappa. Medical, College and HSK Hospital. Blood bank Bagalkot.
2. To compare seropositivity of the HIV among voluntary and replacement blood donors.
3. To know demographic profile of donors with respect to age and sex.

MATERIALS AND METHODS

The present study was carried out in Blood bank of S.N Medical College, Bagalkot from July 2012 to June 2013.
During the study blood units were screened for HIV.
The blood units were collected from voluntary and replacement donors. A voluntary donor is one who donates voluntarily and is not paid for it. A replacement donor is non remunerated donor who donates blood for a particular patient admitted in hospital.

Sample collection:

Two ml of blood sample was collected in labeled pilot tube at the time of collection of blood from donor tubing of blood bag the sample was further centrifuged at 3500 rpm for 5 minutes to obtain clear non hemolyzed serum. The samples were tested for HIV was screened by thick and thin blood smears.

INCLUSION CRITERIA

Any donor meeting all criteria's for eligibility of blood donation as mentioned in SOP, Blood Bank,S.N.Medical College, Bagalkot .

EXCLUSION CRITERIA:

1) Any donor not meeting all criteria's for eligibility of blood donation
2) Any eligible donor having any kind of reaction during the blood donation procedure will be excluded from the studies.
3) Any defects found in the sample collected (Bag Leakage, Improper Maintenance Of Cold Chain During Transportation, Preservation Defects, Temperature Defects, Any Undesirable Physical And Biochemical Changes In Stored Blood)

Screening test for HIV

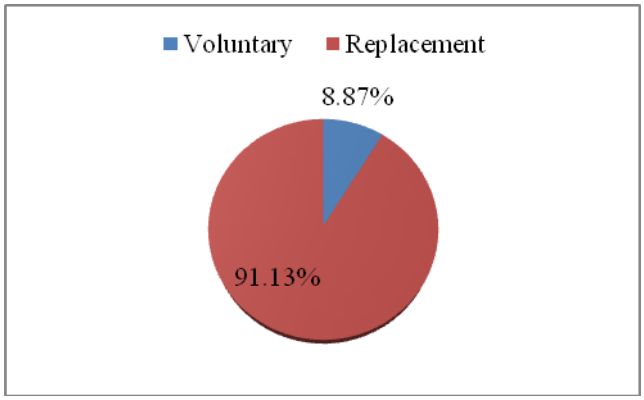
A. Rapid test-HIV TRI-DOT (Manufactured by: Diagnostic Enterprises)
1. SCOPE & APPLICATION
Testing of HIV ELISA reactive and grey zone reactive samples. Testing of samples from reactive bag which to be discard, testing of Apheresis donor sample. (P).

RESULTS

The present study was carried out in Blood, Department of pathology of S. N. Medical College Bagalkot, during the period from July 2012 to June 2013. During the study total 8187 donors blood units were screened for HIV. The donor age ranged from 18-60 yrs, majority (73.96%) in the age group of 18-35 yrs.
Out of the 8187 blood donors, 7461 (91.13%) were replacement donors and remaining 726 (8.87%) were voluntary donors.

Table No.1: Showing Type of blood donors

Type of donor	No. of screened blood units	Percentage
Voluntary	726	8.87%
Replacement	7461	91.13%
Total	8187	100%

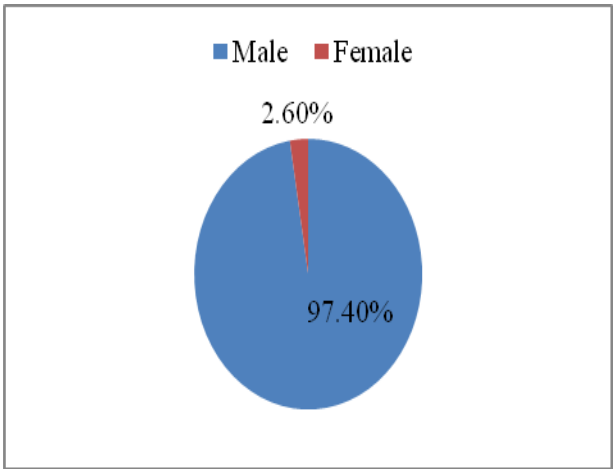


Pie chart No 1: Showing Type of blood donors

Sex distribution: out of the total 8187 donors, males constituted 7974 (97.39%) and only 213 (2.61%) donors were females.

Table No.2: Sex wise distribution of blood donors

Sex	No of screened blood units	Percentage
Male	7974	97.39%
Female	213	2.61%
Total	81.87	100%



Pie chart 2: Showing Sex wise distribution of blood donors

Age distribution: Maximum donors were between the age group of 18-35 years constituting 73.96%

Seroprevalence of HIV in blood donors:

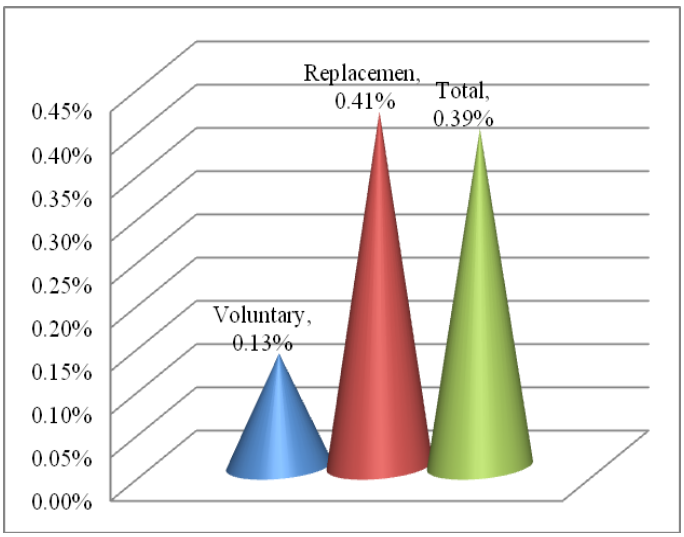
Among the 8187 total donors, the HIV positive donors were 32, with a seroprevalence of (0.39%)

Table No.3: Seroprevalence of HIV in total donors

Total donors	HIV positive units	Seroprevalence
8187	32	0.39%

Table No 4: Seroprevalence of HIV in different donor category

Donor category	No of screened blood units	No. of seropositive units	Percentage
Voluntary	726	1	0.14%
Replacement	7461	31	0.41%
Total	8187	32	0.39%



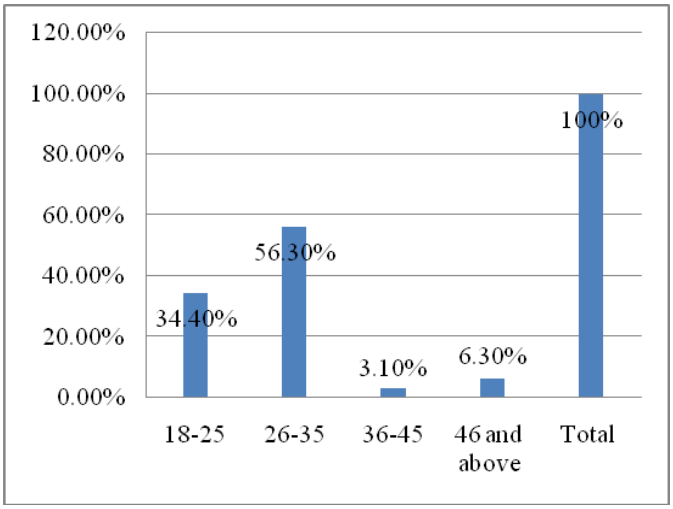
Graph 3: HIV Seropositivity in different types of donors/total donors

Above table shows that of total 8187 blood units screened 32 (0.39%) units were seropositive for HIV. And 31 of the seropositive were replacement donors. The percentage seropositivity in replacement donors is (0.41%) and VD (0.13%) however the difference was statistically not significant.

Age distribution: Out of the total 32 seropositive HIV donors majority (29) were in the age group 18 to 35 years cases

Table No 5: Age-wise distribution of HIV seropositive donors

Age range (yrs)	No. of positive cases	Percentage (%)
18-25	11	34.40%
26-35	18	56.30%
36-45	1	3.10%
46 and above	2	6.30%
Total	32	100%

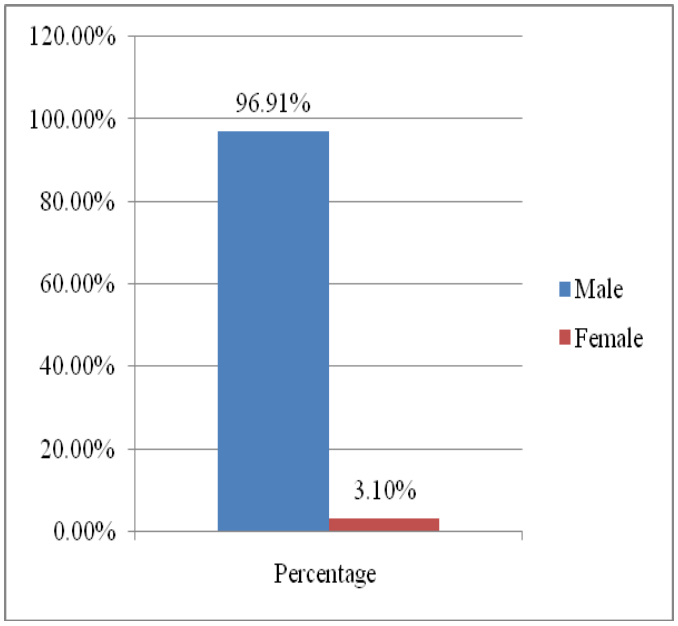


Graph 4: Showing Age-wise distribution of HIV seropositive donors

Sex Distribution: All of the seropositive HIV donors were males and one female.

Table No 6: Sex wise distribution of HIV seropositive donors

Sex	No. of seropositives	Percentage
Male	31	96.91%
Female	1	3.10%
Total	32	100%

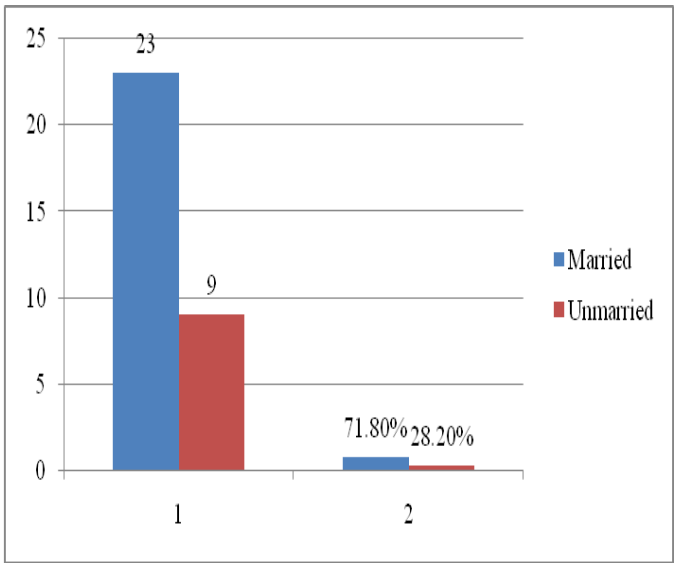


Graph 5: showing Sex wise distribution of HIV seropositive donors

Marital status: Out of the total 32 seropositive HIV donors 23 were married and 9 were unmarried.

Table No 7: Marital status in HIV positive donors:

Marital status	No. of seropositive donors	Percentage
Married	23	71.80%
Unmarried	9	28.20%
Total	32	100%

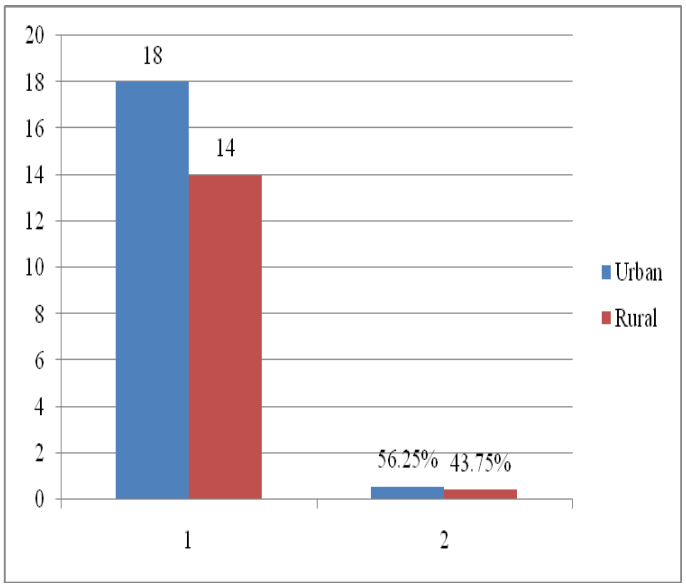


Graph 6: Showing marital status in HIV positive donors

Geographic distribution: Out of the 32 seropositives HIV donors 18 were from urban and 14 were from rural areas.

Table 8: Geographic distribution of HIV positive donors

Area	No.of.seropositives	Percentage
Urban	18	56.25%
Rural	14	43.75%
Total	32	100%



Graph 7: Showing Geographic distribution of HIV positive donors

DISCUSSION

The risk of transfusion transmissible infections (TTI) has declined dramatically in developed nations over the past two decades, primarily because of extraordinary success in preventing HIV and other established transfusion transmitted viruses from entering the blood supply. But same may not hold good for the developing countries. The National Policy for Blood Transfusion Services in our country is of recent origin and the transfusion services are hospital based and fragmented.

The present study was carried out in the Blood Bank, Department of pathology of our institute during the period from July 2012 to June 2013. During the study period 8187 blood units were screened for HIV. The donors age ranged from 18-60 yrs. Similar age range was observed in other studies. In our study 97.39% donors were males while only 2.61% donors were females. This could be explained on the basis that Indian women have a very high incidence of anemia, especially in the child bearing age and hence are likely to face disqualification while being screened for blood donation.

In the present study replacement donors, constituting 91.13% and only 8.87% were voluntary donors. This is comparable to study done by Kakkar et al (94.7%)[4], Srikrisna et al (98.5%)[1] and Singh et al (84.5%)[5].

In contrast predominance of voluntary donors was noted by Bhattacharya et al (94.6%)[6] and Pallavi et al (64.78%)[7]. It is shown that replacement donors constitute the largest group of blood donors in India reflecting lack of awareness among the general population, the presence of misconceptions and fears associated with donating blood, the lack of health education and the indifference attitude of the health sector.

Table No 9: Percentage of voluntary and replacement donors in different studies.

Authors	Voluntary donors (%)	Replacement donors (%)
Srikrishna et al[1]	1.5%	98.5%
Kakkar et al[8]	5.3%	94.7%
Singh et al[5]	15.5%	84.5%
Bhattachary et al[6]	94.6%	5.4%
Pallavi et al[7]	64.78%	35.22%
Present study	8.87	91.13%

SEROPREVALENCE OF HIV

The sexual contact is a major mode of HIV transmission, however blood donation is also important mode of infection.[9]

Globally HIV is one of the biggest challenges faced by the health services. Worldwide the estimated adult prevalence of HIV is around 0.8% in general population.[10] In India, according to the latest estimates the National adult HIV prevalence is 0.34% in general population and in blood donors 0.28% (NACO,2009)[11] In the various Indian studies, the seroprevalence of HIV among blood donors varies from 0.16% to 0.8%.

In our study the seroprevalence for HIV was 0.17% in total donors. The seroprevalence in replacement donors was 0.18%. No voluntary donors were positive for HIV. However the difference in seroprevalence among voluntary and replacement donors was statistically not significant.

Table No 10: Comparision of HIV seroprevalence among donors in different studies

Authors (yrs)	Voluntary	Replacement	Total
Srikrishna et al (1991)[1]	00%	0.44%	0.44%
Garg et al (2001)[9]	0.28%	0.46%	0.44%
Kakkar et al (2004)[4]	00%	0.2%	0.2%
Singh et al (2004)[12]	0.8%	0.8%	0.8%
Singh et al (2005)[13]	0.33%	0.64%	0.54%
Matee et al (2005)[14]	2.0	4.5%	3.8%
Bhattacharya et al (2007)[6]	-	-	0.35%
Arora et al (2010)[15]	00%	0.3	0.3
Farnandes et al (2010)[16]	-	-	0.06
Kaur et al (2010)[8]	-	-	0.6%
Pallavi et al (2011)[17]	-	-	0.44%
Present study (2011)	0.137	0.41	0.39

The seroprevalence of HIV in our study in total donor was 0.39%, which is comparable to the study by Garg et al (2001)[9]. The seroprevalence in replacement donors was 0.41% which is comparable to the study by Srikrishna et al (1991)[1].

In our study one voluntary donor was found to be positive for HIV, which is nearer to the finding of Garg et al (2001)[9].

The seroprevance of HIV in various Indian studies ranged from 0.06 to 3.8%. In our study seroprevalence of HIV is slightly more compared to national data (0.28%). This can be attributed to strict donors selection criteria.

In our study 31 seropositive donors were males and one female similar to the study by Srikrishna et al[1] and Kakkar et al.[4]

Since only one voluntary donor blood unit showed seropositivity to HIV in our study, suggest the need for implementing programmes to achieve 100% voluntary donations.

In India presently WHO strategy 1 is followed for screening blood donors for HIV. According to this strategy, if the test is negative for HIV antibodies, the blood unit is considered free of HIV and if reactive the unit is discarded. the donors found reactive for by initial assay are directed by blood transfusion services to linked

voluntary counseling and Testing centre (VCTC) for counseling and further confirmatory testing without repeating test in blood bank.

In our present stud we followed the same strategy. The seroreactive donors were given the post test counseling and were advised to modify high risk behavior and to self exclude from future donations. They referred to VCTC for counseling and further confirmatory testing.

CONCLUSION

In the present study. It has been established that the incidence of transfusion transmissible infections (TTI) decreased considerably after mandatory testing of blood units for HIV.

However, the risk of TTI cannot be eliminated completely even after mandatory testing of blood units because of risk associated with donations during window period. With advent of nucleic acid amplification techniques (NAT) western countries have decreased the risk of TTI to a major extent. This decrease the window period and hence decrease in incidence of TTI. But the cost effectiveness of the NAT is poor. Its high cost is of concern especially in economically restricted countries.
Our study showed that the seroprevalence of TTI was more in replacement donors compared to voluntary donors. However it was statistically not significant.

These results suggest that voluntary blood donors services are needed. There should be an establishment of nationally coordinated blood transfusion services. All blood should be tested for TTI with reduction in unnecessary blood transfusion. Thus ensuring safe blood supply to the recipients.

With the implementation of strict donor selection criteria, use of sensitive screening tests, and establishment of strict guidelines for blood transfusion, it may be possible to reduce the incidence of TTI in Indian scenario.

SUMMARY

- A prospective study to evaluate the seroprevalence of HIV, HBsAg, HCV, and the prevalence of malaria was undertaken between July 2012 to June 2013.
- A total number of 8187 donors blood units were screened.
- Replacement donors constituted 91.13% and remaining 8.7% were voluntary donors.
- The donors age ranged between 18-60 years with majority (73.96%) in the range of 18-35 years.
- 97.39% donors were males and female donors constituted only 2.61%
- The seroprevalence of HIV was 0.39% in total donors. Majority of HIV seropositve blood units were from replacement donors and from males.Only one female voluntary blood donor was found to be positive for HIV. The seropositity for HIV was more in married and urban donors.
- Prevalence of all the TTI were more in the age group of 18-35 years.

REFERENCES

1. Srikrishn A, Sitalaxmi S, Domodhar P. How safe are our safe blood donors?. Indian J Pathol Microbial 1999; 42:411-416.
2. NACO. Standards for blood banks and blood transfusion services 2007;33-34.
3. Afsar I, Gungor S, Sener AG. The prevalence of HBV, HCV, and HIV infections among blood donors of Izmir, Turkey. Indian J Med Microbiol 2008; 26:288-290.
4. Kakkar N, Kaur R, Dhanoa J. Vo luntary donors – need for a second look. Indian J Pathol Microbiol 2004;47:381-83.
5. Singh K, Bhat S, Shastry S. Trend in seroprevalence of hepatitis B virus infection among blood donors of coastal Karanataka, Indian J Infect Dev Ctries 2009;3:376-379.
6. Bhattacharya P, Chandra PK, Datta S, Banarjee A et al. Significant increase in HBV, HCV, HIV and syphilis infection among blood donors in West Bengal, Eastern India, 2004-2005. Exploratory screening reveals high frequency of occult HBV infection. World J Gastroenterol 13:3730-3733.
7. Pallavi P, Ganesh CK, Jayashree K, Manjunath GV. Seroprevalence and trends in transfusion transmitted infections among blood donors in a University hospital Blood Bank : A 5 year study. Indian J Hematol, Blood Transfus 2011;27(1):1-6.
8. Gagandeep Kaur SB, Ravneet Kaur , Paramjit Kaur , Shailja Garg. Patterns of infections among blood donors in a tertiary care centre:A retrospective study. The Nat Med J of India 2010. p. 147-9.
9. Garg S, Mathur DR, Garg DK. Comparision of seropositivity of HIV, HBV, HCV, and syphilis in replacement and voluntary blood donors in Western India. Indian J Pathol / Microbiol 2001;44(4):409-412.
10. HIV/AIDS estimates are revised downwards; world health statistics 2008:p.13-14.
11. NACO. Annual Report New Delhi 2010-2011.
12. Singh B, Katriya S, Gupta R. Infectious markers in blood donors of East Delhi: Prevalence and Trends. Indian J Pathol / Microbiol 2004; 47(4):477-479.

13. 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.

14. Matee M, Magesa P, Lyamuya E. Seroprevalence of human immunodeficiency virus, hepatitis B and C viruses, and syphilis infectio ns among blood donors at the Muhimbili National Hospital in Dar Es Salaam, Tanzania BMC Public Health 2006;6:21.

15. Arora D, Arora B, Kheterpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in Southern Haryana. Indian J Pathol Microbiol 2010;53 (2):308-309.

16. Fernamales S H, D'souza PF, Disooza P M Indian of Heamatology and Blood transtision 2010 26(3) 89-91.

17. Sharma VK, Khanpur S. Changing patterns of sexually transmitted infections in India.. Natl Med J India, 2004; 17:310-19.