

Seroreactivity of Syphilis Among Blood Donors of A Blood Bank

Ashwin. P. Khageshan^{1*}, Keshav. R.Kulkarni¹, Mahesh. C. Baragundi²

¹Dept. of Pathology, S.N. Medical College, Navangar, Bagalkot Karnataka. India

²Dept of Microbiology, S.N. Medical College, Navangar, Bagalkot Karnataka. India

Keywords: RPR, Transfusion, Syphilis.

ABSTRACT

INTRODUCTION: Blood transfusion involves transfer of biological material from man to man. Many infectious diseases are likely to be transmitted by blood transfusion. Syphilis, known in India as Portuguese disease or franga or frangi roga reached the subcontinent in early 16th century and soon became widespread. A comparison of the present data on syphilis reactivity among blood donors with that seen a decade back (1986 - 1990) revealed a sharp decline from 14.6% to 9.26% in syphilis. Since there was no data from our geographical area about syphilis seroreactivity among blood donors, the present study was conducted to know the seroreactivity of syphilis among voluntary and replacement blood donors.

METHODS: The present study was carried out in Blood bank of S.N Medical College, Bagalkot from July 2012 to June 2013. Two ml of blood sample was collected in labeled pilot tube at the time of collection of blood from donor tubing of blood bag. Serum was separated. The samples were tested for syphilis by RPR test.

RESULTS: Out of the 8187 blood donors, 7461 (91.13%) were replacement donors and remaining 726 (8.87%) were voluntary donors. Out of total 8187 donors screened, 4 (0.04%) units were seroreactive for rapid plasma regain test for syphilis. Four seroreactive units were from replacement donors.

CONCLUSION: Seroreactivity of syphilis is low in our geographical area. Voluntary donations are safer as compared to replacement ones and should be encouraged.

***Corresponding author:**

Dr. Ashwin .P. Khageshan , Associate professor, Dept. of pathology, S.N. Medical College, Navangar, Bagalkot- 587102, Karnataka. India

Phone: +91 9448491499

Email: drashwinp@gmail.com



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 infections (TTIS) such as Human immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), syphilis and malaria are among the greatest threats to blood safety for recipient. According to National Aids Control Organisation (NACO) guidelines, all mandatory tests should be carried out on donors blood samples for HIV, HBV, HCV, syphilis and malaria. The whole blood or components from any unit that tests positive should be discarded.^[2]

Syphilis, known in India as Portuguese disease or firanga or firangi roga reached the subcontinent in early 16th century and soon became widespread. A comparison of the present data on syphilis reactivity among blood donors with that seen a decade back (1986 - 1990) revealed a sharp decline from 14.6% to 9.26% in syphilis.^[3]

Sawke et al,^[4] have reported that among blood donors, total seropositive samples for syphilis to be 0.23% by using enzyme linked immunosorbent assay and rapid plasma reagin test (RPR). Hilda F et al^[5] and Giri et al^[6] al have reported 0.11% and 0.07% syphilis seropositivity among blood donors respectively.

The RPR test uses a stabilized suspension of antigen to which charcoal particles are added to aid in the visualization of the test reaction. The RPR test is one of the most commonly used non treponemal tests, and is a simplified version of the VDRL test.

Since there was no data from our geographical area about syphilis seroreactivity among blood donors, the present study was conducted to know the seroreactivity of syphilis among voluntary and replacement blood donors using RPR test.

Materials and Methods

The present study was carried out in Blood bank of S.N Medical College, Bagalkot from July 2012 to June 2013. The study was approved by institutional ethical committee.

The blood bank of department of pathology, S.N Medical College is licenced blood bank with average annual collection of 8000 units of blood from healthy blood donors from in and around Bagalkot annually.

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: Any eligible donor having any kind of

reaction during the blood donation procedure was excluded from the study.

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 centrifuged at 3500 rpm for 5 minutes to obtain clear non hemolyzed serum.

Test for syphilis was done by RPR test (Carbogen kit-Tulip diagnostics pvt ltd, India) along with positive and negative controls.

Results

Pie chart-1, shows type of blood donors. Out of the 8187 blood donors, 7461 (91.13%) were replacement donors and remaining 726 (8.87%) were voluntary donors.

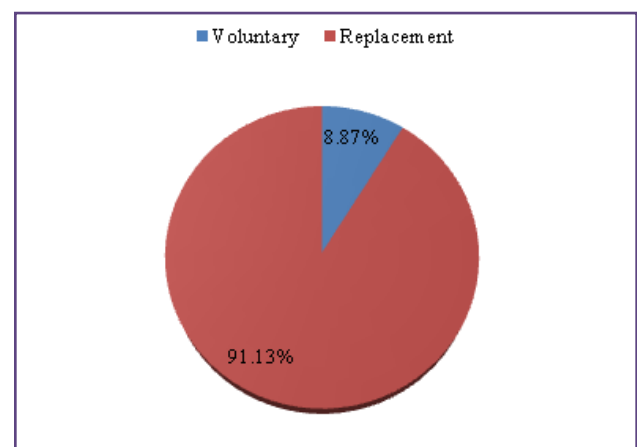
Table-1 shows, age wise distribution of syphilis positive donors. Maximum seroreactive donors (50%) were seen in 26-35 years age group.

Seroreactivity of syphilis: Among the total 8187 donors only 4 donors were positive for syphilis with a seroreactivity rate of 0.04%.

Graph-1, shows that out of total 8187 donors screened, 4 (0.04%) units were seroreactive for rapid plasma regain test for syphilis. Four seroreactive units were from replacement donors. None of the blood units from voluntary donors showed seroreactivity to RPR test for syphilis. However the difference was statistically not significant.

All four the reactive donors were males and two were married and other two were unmarried. Two reactive donors for syphilis were from urban and other two were from rural area.

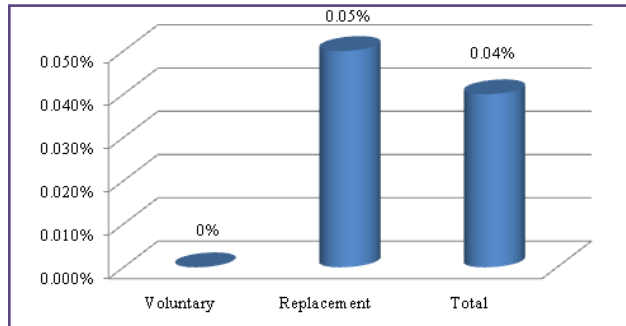
Among 4 syphilis reactive donors, three were associated HBV and one was associated with HIV co infection.



Pie chart No 1: Showing Type of blood donors

Table 1: Age wise distribution of syphilis positive donors

Age Range (yrs)	No. of reactive Samples	Percentage
18-25	0	0%
26-35	2	50%
36-45	1	25%
46 and above	1	25%
Total	4	100%



Graph 1: Seroreactivity of Syphilis in different donor categories

Discussion

In the present study replacement donors, were 91.13% and only 8.87% were voluntary donors. This is comparable to study done by Kakkar et al (94.7%),^[7] Srikrishna et al (98.5%)^[1] and Singh et al (84.5%).^[8] In contrast predominance of voluntary donors was noted by Bhattacharya et al (94.6%)^[9] and Pallavi et al (64.78%).^[10]

In India, constant decline in the prevalence of syphilis is observed. In a study at Chandigarh major decline in syphilis has been observed. The prevalence of syphilis decreasing from 10.4% in 1977-85 to 2.5% in 1995-96.^[11]

Srikrishna et al (1999),^[1] Sonawane et al (2003)^[12] and Singh et al (2005)^[13] in their studies noted the seroprevalence of syphilis among the blood donors as 1.6%, 0.87% and 0.26% respectively.

Sharma et al (2004)^[14] in a review article described in detail the changing pattern of sexually transmitted infection in India. They quote that Choudhari et al (1995) observed the seroprevalance of syphilis as zero percent among the blood donors from Lucknow.

Singh et al (2005)^[13] and Matee et al (2006)^[15] observed a statistically significant difference among voluntary and replacement donors suggesting that voluntary donors are safe donors

In the present study out of the total 8187 screened blood donors only four donors blood units showed seroreactivity

for syphilis giving the seroprevalence of 0.04%. The seroprevalence in a replacement donors was 0.05%. No voluntary donors were found reactive for syphilis. However the difference was statistically not significant. Since the number of voluntary donors was less and the prevalence of syphilis was very low, large scale study is needed to establish the significance.

Table -2 shows, comparison of syphilis seroprevalence among donors in different studies.

Table 2: Comparison of syphilis seroprevalence among donors in different studies

Author (yrs)	Voluntary	Replacement	Total
Srikrishna et al (1991)[1]	-	-	1.6%
Garg et al (1998)[16]	0.129%	0.239%	0.22%
Sonawane et al (2003) [12]	0.33%	1.12%	0.87%
Singh et al (2005) [13]	1.4%	2.8%	2.6%
Bhattacharya (2007) [9]	-	-	0.8%
Arora et al (2010) [17]	-	-	0.9%
Pallavi et al (2011) [10]	-	-	0.28%
Choudhary et al (1995) [14]	00%	00%	00%
Present study	00%	0.05%	0.04%

The seroprevalence of syphilis in our study was 0.04%, which is low compared to other studies except the study by Choudhary et al in Sharma et al (2004)^[14] study, which showed, no donors were reactive for syphilis.

This finding of our present study might be due to the declining trends in the prevalence of syphilis in general population due to improved access to health care, improved diagnostic means, effecious treatment modalities and general health awareness among the population especially due to the emergence of HIV.

Among 4 syphilis reactive donors, three were associated HBV and one was associated with HIV co infection which could be due to common modes of transmission of these agents.

In our study we have tested the blood units with RPR test. The cardiolipin antigen antigens used in RPR test may tend to give biological false reactive reaction (BFR) in the conditions like malaria, mumps, measles, lepromatous leprosy, collagen disease, rheumatoid arthritis, infectious mononucleosis, rubella, leptospirosis, relapsing fever etc. The seroreactive donors for RPR test were counseled and advised confirmatory testing by other treponemal test.

In conclusion, Seroreactivity of syphilis is low in our geographical area. TTIs pose a definite risk to the recipient of the blood. Due to a similarity in risk factors and routes of

transmission, public awareness and education would go a long way in curbing the prevalence of these infections and increasing blood safety. Voluntary donations are safer as compared to replacement ones and should be encouraged.

References

1. Srikrishn A, Sitalaxmi S, Domodhar P. How safe are our safe blood donors?. *Indian J Pathol Microbiol* 1999; 42:411-416.
2. NACO. Standards for blood banks and blood transfusion services 2007;33-34.
3. Thappa D, Kaimal S. Sexually transmitted infections in India: Current status (except human immunodeficiency virus/acquired immunodeficiency syndrome). *Indian Journal of Dermatology* 2007;52(2):78.
4. Sawke N, Sawke GK, Chawla S. Seroprevalence of common transfusion-transmitted infections among blood donors. *People's journal of scientific rearch* 2010;3(1):5-7.
5. Fernandes H, D'souza P, D'souza P. Prevalence of transfusion transmitted infections in voluntary and replacement donors. *Indian of Heamatology and Blood transtision* 2010; 26(3) 89-91.
6. Giri PA, Deshpande JD, Phalke DB, Karle LB. Seroprevalence of transfusion transmissible infections among voluntary Donors at a tertiary care teaching hospital in rural area of India *J.FAm med primary care* 2012;1:48-51.
7. Kakkar N, Kaur R, Dhanoa J. Voluntary donors – need for a second look. *Indian J Pathol Microbiol* 2004;47:381-83.
8. 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.
9. Bhattacharya P, Chandra PK, Datta S, Banarjee. 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.
10. 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.
11. Sharma VK, Khanpur S. Changing patterns of sexually transmitted infections in India. *Natl Med J India* 2004; 17:310-19.
12. Sonawane BR, Birare SD, Kulkarni PV. Prevalence of seroreactivity among blood donors in rural population. *Indian J Med Sci* 2003;57:405-407.
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. Sharma R, Cheema R, Vajpayee M, Rao U, Kumar S. Prevalence of markers of transfusion transmissible diseases in voluntary and replacement donors. *The Nat med J of India* 2004;17:19-21.
15. Matee M, Magesa P, Lyamuya E. Seroprevalence of human immunodeficiency virus, hepatitis B and C viruses, and syphilis infections among blood donors at the Muhimbili National Hospital in Dar Es Salaam, Tanzania. *BMC Public Health* 2006;6:21-29.
16. Garg S, Mathur DR, Garg DK. Comparison 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.
17. 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.