



SEROPREVALENCE AND TRENDS OF TRANSFUSION TRANSMISSIBLE INFECTIONS IN BLOOD DONORS IN SURYAPET BLOOD BANK AREA, TELANGANA- AN RETROSPECTIVE STUDY IN TERTIARY CARE HOSPITAL.

Dr. Saritha CS

Associate Professor, Department Of Pathology, Government Medical College, Suryapet, Telangana.

Dr. Madhukar Reddy Kadaru*

Assistant Professor, Department Of Pathology, government Medical College, Suryapet, Telangana. *Corresponding Author

ABSTRACT

AIM: To determine the frequency of transfusion transmissible infections in various ABO and Rh(D) blood group donors in suryapet blood bank area.

Materials and Methods: A Three year i.e from January 2016 to December 2018, retrospective cross-sectional study was conducted on all voluntary and replacement donors in suryapet blood bank, a tertiary health care centre in government medical college, suryapet . Donor blood was screened for HIV, HBV, HCV, Syphilis using rapid kits and ELISA.

Results: Out of 7,035 donors, 7014 (99.70%) were males and 21 (0.29%) were females. 5,518 (78.43%) were voluntary donors and 1,517 (21.56%) were replacement donors. Majority of the screened donors belonged to 21 to 39 age group. Out of 7,035 donors, 211 (2.99%) were seropositive. Among them, 20 (0.28%) were HIV positive, 24 (0.34%) HCV positive, 167 (2.37%) HBsAg positive, no positivity for Syphilis .

KEYWORDS : Replacement Donors, voluntary donors, Enzyme Linked immuno sorbent assay ELISA

INTRODUCTION

A single unit of blood and even its components can save multiple recipients in need by blood transfusion, which is a life saving procedure[1]. If proper screening is not done of the donated blood, it can be source of transfusion transmitted infections (TTI), blood can save lives[2]. For five transfusion transmission infections, namely human immune deficiency virus(HIV), Hepatitis B and C, syphilis[2].

With the aim of improving the quality and safety of the blood supply, several measures have been introduced in to the screening of blood donations to detect diseases that may be transmitted via blood transfusions, over the past two to three decades [3].

Serological testing for TTI is foundation for blood screening, newer strategies like nucleic acid testing (NAT) have shortened the “window period”[4]. No matter how sensitive NAT becomes we never able to completely close the exposure-to- sero conversion “window period”[5]. A non zero risk of diseases transmission still exists in all its seriousness, regardless of testing modalities[6]. India has 5.7 million HIV positive, 43 million HBV positive and 15 million HCV positive persons [7]. The aim of this study in current practice was to determine the frequency of HBs Ag, HCV, HIV and syphilis in various ABO and Rh(D) blood group donors.

MATERIALS AND METHODS,

A Three year i.e from January 2016 to December 2018, retrospective cross-sectional study was conducted on all voluntary and

replacement donors in suryapet blood bank, a tertiary health care centre in government medical college, suryapet . Donor blood was screened for HIV, HBV, HCV, Syphilis using rapid kits and ELISA study population included a total of 7035 blood units of both voluntary and replacement donors. Data such as age, gender, and results of screening tests for TTI's were collected.

TTI screening

After a donor passed pre-donation screening, 5 ml of blood from each donor was used for screening transfusion transmitted infections such as HIV, HBV, HCV and syphilis. The hepatitis B surface antigen (HBs Ag) and Hepatitis C virus were tested by 3rd generation ELISA methods. HIV(1and 2) was tested by 3rd and 4th generation ELISA (TRIDOT) methods using NACO approved kits. screening for syphilis was done by rapid plasma reagin(RPR)method. Strict Confidentiality was maintained for positive results.

RESULTS:

A total of 7035 blood donors were screened for transfusion transmitted infections, among them 5,518(78.43%) were voluntary donors and 1,517(21.57%) were replacement donors. The proportion of male donors was very high 7014(99.70%), female was low 21(0.29%). Out of 7,035 screened donors over all 211(2.99%) were seropositive cases. The over all prevalence of HIV, HBsAg, HCV and syphilis was 20(0.28%), 167(2.37%), 24(0.34%) and there were no syphilis positivity. Overall prevalence of Hepatitis B(HBsAg) were found to be highest, followed by HCV and HIV respectively (**Table No-1**)

Table No:1 : Yearly distribution of donors, sex and seopositive cases.

	TOTAL DONORS	Male	Female	VD	RD	HIV	HBs Ag	HCV	VDRL
2016	2570	2562	8	2016	554	7	61	9	0
2017	2784	2781	3	2193	591	8	69	11	0
2018	1681	1671	10	1309	372	5	37	4	0
TOTAL(%)	7035 (100%)	7014 (99.70%)	21 (0.30%)	5518 (78.43%)	1517 (21.57%)	20 (0.28%)	167 (2.37%)	24 (0.34%)	0
GRAND TOTAL(%)	7035(100%)	7035(100%)		7035(100%)		211(2.99%)			

VD= voluntary donors, RD= Replacement donors

DISCUSSION;

World wide, countless people are helped by a life saving process as blood transfusion. Mainly in developing and underdeveloped countries, TTIs continue to be a potential threat and affect the safety blood transfusion practices[1]. The frequency of transfusion transmitted infections as reported in various studies conducted on blood donors inside india and outside india is tabulated in **Table no 2** and **Table no 3** respectively.

Table No:2: The prevalence of TTIs in various studies conducted within India.

Studies	Place	HIV%	HbsAg%	HCV%	VDRL%
Present study	Suryapet, TS	0.28	2.37	0.34	0.0
Leena, 20128	Karimnagar, TS	0.27	0.71	0.14	0.10
Bhawani, 20099	Vikarabad, TS	0.39	1.41	0.84	0.08
Banu S, 20181	Chittoor, AP	0.06	2.10	0.15	0.04
Mondal R, 201610	Darjeeling, WB	0.42	1.24	0.62	0.65

Nigam JS, 2014 ¹¹	Uttarpradesh,UP	0.05	0.97	0.63	0.46
Dayal S, 2011 ¹²	Etawah ,UP	0.19	2.63	0.34	Not Done
Chadra,2006 ¹³	Lucknow,UP	0.23	1.96	0.85	0.01
Jasmin,2012 ¹⁴	Baroda ,GJ	0.25	1.35	0.16	0.90
Negi G,2014 ²	Uttarakhand	0.20	1.20	0.90	0.30
Nilima s,2008 ¹⁵	Bhanpur ,M.P	0.51	2.90	0.57	0.23
Gupta N,2004 ¹⁶	Ludhiana ,PJ	0.08	0.66	1.09	0.85
Kaure H 2014 ¹⁷	Amritsar,PJ	0.16	0.75	1.75	0.67
Chaudary 2013 ¹⁸	Western ,UP	0.27	1.93	1.02	0.16
Naskar S 2013 ¹⁹	Kolkata, WB	0.28	1.75	0.37	0.44
Mehta 2013 ²⁰	Jamnagar, GJ	0.30	1.20	0.26	0.50
Sehgal s,2017 ²¹	Andaman and nicobar	0.06	1.05	0.12	0.24

In the studies conducted by Bhawani et al⁹(2009) in vikarabad, Telangana (TS), Banu S et al¹ (2018)in chitoor,Andhra Pradesh, Mondal R, et al¹⁰ (2016)Darjeeling,westbengal,Dayal S et al¹²(2011),Etawah,uttarpradesh(UP),Chadra et al¹³(2006) Lucknow, UP, Negi G et al²(2014), Uttarakhand, Nilima s et al¹⁵ (2008), Bhanpur , M.P, Chaudary et al¹⁸ 2013, Western ,UP,showed similar results with high prevalence of Hbs Ag, followed by Hepatitis C virus , HIV and syphilis.

In the study conducted by **Leena et al⁸ (2012), Karimnagar, TS** the highest prevalence was seen in Hbs Ag,second most prevalent transfusion transmitted infection among the blood donors of this area is HIV followed by HCV and syphilis which is contrast to our study where the second most prevalent TTI was HCV not the HIV.

In the studies conducted by Sehgal s et al²¹(2017), Andaman and nicobar, Mehta et al²⁰ (2013), Jamnagar, GJ, Naskar S et al¹⁹ (2013), Kolkata, WB, the second most prevalent TTI is a VDRL disease that is syphilis followed by HCV and HIV Which is contrast to our study.

Gupta N et al¹⁶ (2004), Ludhiana ,PJ, Kaure H et al¹⁷(2014), Amritsar,PJ the most prevalent was Hepatitis C Virus in both the studies followed syphilis,HBS Ag,and in Ludhiana study,where as in Amritsar study HBs Ag occupied the second postion followed by syphilis and HIV which is contrast to our study.

The reason for this contrast studies should be evaluated,probably socio economic factors,pre and post donation screening techniques and the number of participants in studies conducted could be the factor for variation in TTIs within India.

Table No;3:Comparison of frequency of TTIs in various studies of other countries.

Studies	Place	HIV%	HbsAg%	HCV%	VDRL%
Present study	Suryapet, TS, India	0.28	2.37	0.34	0.0
Zheng X, 2015 ²²	China	0.15	0.51	0.25	-
Zameer M, 2017 ²³	Pakistan	0.11	1.59	3.85	2.08
Shrestha, 2009 ²⁴	Nepal	0.12	0.47	0.64	0.48
Ahmad mu,2009 ²⁵	Bangladesh	0.008	1.39	0.024	-
Khedmat 2007 ²⁶	Iran	0.003	0.48	0.093	0.005
Buseri, 2009 ²⁷	Nigeria	3.1	18.6	6.0	1.1
Matee, 2006 ²⁸	Tanzania	3.8	8.8	1.5	4.7

In the studies conducted by **Zheng X et al²², (2015), China, Ahmad mu, et al²⁵ (2009), Bangladesh, Khedmat(2007), et al²⁶ Iran, Zameer M, et al²³ (2017), Pakistan, Buseri , et al²⁷ (2009) Nigeria,** have similar results followed with high prevalence of HBs Ag, followed by HCV,HIV and syphilis.probably due to the same geographic area except the study conducted in Nigeria.

In the studies conducted by **Matee , et al²⁸ (2006) Tanzania,** though there is high prevalence of HBs Ag, followed by VDRL that is syphilis,HIV and HCV.

CONCLUSION

The present study concludes that because of high prevalence of TTIs in these areas which are transmitted through blood causes the risk of seropositivity for the recipients .This study urges for strict donor selection criteria,high donor sensitivity screening tests.

REFERENCES:

1. C R Sirajunnisa Begum, S Nafeesa Banu, and Venkatraman J Seroprevalence of Transfusion Transmitted Infections Among Blood Donors in a Tertiary Care Hospital in Andhra Pradesh Annals of Pathology and Laboratory Medicine, Vol. 5, Issue 1, January, 2018, DOI: 10.21276/APALM.1674.
2. Negi G, Gaur DS. Trends of transfusion transmissible diseases among blood donors at Uttarakhand, India. Indian J Community Med 2014;39:183-6.
3. Bhawani Y, Rao PR, Sudhakar V. Seroprevalence of transfusion transmissible infections among blood donors in a tertiary care hospital of Andhra Pradesh. Biology and Medicine 2010;2:45-8.
4. Rahul Chaurasia, Shamsuz Zaman, Bankim Das, and Kabita Chatterjee, Screening Donated Blood for Transfusion Transmitted Infections by Serology along with NAT and Response Rate to Notification of Reactive Results: An Indian Experience, Journal of Blood Transfusion Volume 2014, Article ID 412105, 6 pages <http://dx.doi.org/10.1155/2014/412105>.
5. C. M. N ubling, M. Heiden, M. Chudy et al., "Experience of mandatory nucleic acid test (NAT) screening across all blood organizations in Germany: NAT yield versus breakthrough transmissions," Transfusion, vol. 49, no. 9, pp. 1850-1858, 2009.
6. L. M. Kucirka, H. Sarathy, P. Govindan et al., "Risk of window period HIV infection in high infectious risk donors: systematic review and meta-analysis," The American Journal of Transplantation, vol. 11, no. 6, pp. 1176-1187, 2011.
7. 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.
8. Leena MS, Shafe M. Trend and prevalence of transfusion transmitted infections among blood donors in rural teaching institute, South India. Journal of Pathology of Nepal. 2012;2:203-206.
9. Yedlapati Bhawani P Raghava Rao1, V Sudhakar2 Seroprevalence of transfusion transmissible infections among blood donors in a tertiary care hospital of Andhra Pradesh from. 2004-2009,3-4
10. Mondal R, Mondal K. Transfusion transmissible infections among blood donors from a sub-Himalayan rural tertiary-care centre in Darjeeling, India. J Travel Complement Med. 2016;6:224-29.
11. Nigam JS, Singh S, Kaur V, Giri S, Kaushal RP. The prevalence of transfusion transmitted infections in ABO blood groups and Rh type system. Hematol Rep 2014;6:5602.
12. Dayal S, Omar B J, Sipai H H, Agarwal S K, Chandra S, Chaturvedi V. Prevalence of transfusion transmitted Viral Diseases among blood donors in a rural setup of North India from. 2006-2011,3-4
13. Chandra T, Kumar A, Gupta A. Prevalence of transfusion transmitted infections in blood donors: an Indian experience. Transfusion. 2009;49(10):2214-20.
14. Jasmin Jasani , Vaidehi patel , Kaushik Bhuvu , Anand vachhani , Himani patel , J.J.Falleiro, Seroprevalence of transfusion transmissible infections among blood donors in tertiary care hospital Int J Biol Med Res. 2012; 3(1):1423-1425.
15. Nilima Sawke, GK Sawke, S Chawla Seroprevalence Of Common Transfusion - Transmitted infections among Blood Donors at bhanpur,bhopal,M.P. from 2006-2008.
16. Gupta N, Kumar V, Kaur A. Seroprevalence of HIV, HBV, HCV and syphilis in voluntary blood donors. Indian J Med Sci. 2004;58:255-257
17. Kaur H, Mannan R, Manjari M. Seroprevalence of the Blood Borne Infection in Blood Donors: Our 11 Year (2001-2011) Experience in a Tertiary Care Teaching Hospital at Amritsar (Punjab). International Journal of Advanced Research. 2014; 6(2):967-72.
18. Chaudhary V, Agrawal VK, Sexena SK, Upadhyay D, Singh A, Singh SP. Seroprevalence of common transfusion transmissible infections among blood donors in western Uttar Pradesh, India. Int J Med Sci Public Health 2014;3:1381-1384.
19. Naskar S, Nandy S, Basu K, Basu R. Study of Seroprevalence of HIV, Hepatitis B and C And Syphilis Among Blood Donors In A Tertiary Care Hospital, Kolkata. IOSR Journal of Dental and Medical Sciences. 2013; 11(3):63-66.
20. Mehta D, Vachhani JH, Desai NJ. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors. Indian Journal of Research, 2013;2:2:240-241.
21. Sahil Sehgal et al., Seroprevalence and Trends of TTIs in Blood Donors in Andaman and Nicobar Islands, Journal of Clinical and Diagnostic Research. 2017 Apr, Vol-11(4): EC21-EC24, DOI: 10.7860/JCDR/2017/25137.9649.
22. Zheng X, Ding W, Li G, Wu Y, Wu D, Zhu H, et al. Seroprevalence of transfusion-transmissible infectious agents among volunteer blood donors between 2006 and 2012 in Zhejiang, China. Blood Transfusion. 2015; 13(3):401.
23. Zameer M, Shahzad F, Shafi Khan F, Ali H, Saeed U, Farooq M. Transfusion transmissible infections among healthy blood donors at blood bank from children's hospital & institute of child health Lahore. Pak Armed Forces Med J 2017;67(1):131-36.
24. Shrestha AC, Ghimire P, Tiwari BR, Rajkarnikar M. Transfusion-transmissible infections among blood donors in Kathmandu, Nepal. The Journal of Infection in Developing Countries. 2009; 3(10):794-7.
25. Ahmed MU, Begum HA, Hossain T, Chakraborty P. Incidence of common transfusion transmitted diseases among blood donors. Journal of Armed Forces Medical College, Bangladesh. 2009; 5(1):4-6.
26. Khedmat H, Fallahian F, Abolghasemi H, Alavian SM, Hajibeigi B, Miri SM, et al. Seroepidemiologic study of hepatitis B virus, hepatitis C virus, human immunodeficiency virus and syphilis infections in Iranian blood donors. Pak J Biol Sci. 2007; 10(24):4461-6.