



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 5(B), pp. 26598-26600, May, 2018

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

PREVALENCE OF TRANSFUSION TRANSMITTED INFECTIONS (TTIs) AMONGST BLOOD DONORS OF NORTH ODISHA – A 8 YEARS STUDY

Mahesh Biswal., Pranati Mohanty., Pritilata Panda and BinayBhusanSahoo

Department of Pathology Baripada Odisha

DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0905.2088>

ARTICLE INFO

Article History:

Received 16th February, 2018

Received in revised form 12th

March, 2018

Accepted 20th April, 2018

Published online 28th May, 2018

Key Words:

Seropositivity, TTIs

ABSTRACT

Back Ground: Transmission of infectious diseases such as HIV, hepatitis, syphilis and others through donated blood needs a serious monitoring. Provision of safe blood transfusion is warranted in all types of medical and surgical therapy. PRM Medical College and hospital provides health services to people of north Odisha and neighbouring districts of Jharkhand and West Bengal. Odisha blood bank, Baripada fulfills the blood need of the hospitals, nursing homes and nearby other health institutions.

Objective: This study was under taken to know the magnitude of seropositivity amongst blood donors and plan for donor safety.

Materials and methods: A prospective observational study was conducted for a duration of 8 years in the Odisha blood bank from 1st January 2010 to 31st December 2017. All the donor blood samples were screened for HIV, HBsAg, anti-HCV by ELISA method. Syphilis was screened by RPR kit and malaria by ICT card method. Donors already known seropositive for these infections and hemoglobin less than 12.5 g% were excluded.

Results: Among the total 53,786 donors 22,217 (41.31%) were replacement donors while 31,569 (58.69%) were voluntary donors. Male donors (48,798) comprised 99.08% and the remaining were female donors 4988 (0.92%). Total seropositivity found were 1.463% including 0.128% for HIV, 0.394% for HBsAg, 0.120% for HCV, 0.113% for Malaria and 0.706% for Syphilis.

Conclusion: Seropositivity for TTIs in healthy donors comprises 1.463%; thus, a potential for transfusion through blood transfusion. So, a strict donor screening with higher generation ELISA kit is warranted to prevent transmission of various infections through blood products.

Copyright © Mahesh Biswal et al, 2018, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Transfusion of blood and its components is lifesaving as well as it has life threatening hazards. With every unit of blood there is 1% chance of transfusion associated problems including transfusion transmitted infections (TTIs)¹. A majority of known cases of post transfusion infections have been caused by Human Immunodeficiency Virus (HIV), Hepatitis-B (HBV), Hepatitis-C virus (HCV), Trepanemapallidum, malaria parasites and others. To reduce the TTIs, the Govt. of India mandates screening of each and every unit of blood for hepatitis B surface antigen (HBs Ag), anti-HIV, anti-HCV, malaria and syphilis as per Drugs and Cosmetic Act 1940 and Rules 1945.

PanditRaghunathMurmu (PRM) Medical College & Hospital, Baripada and its blood bank-Odisha blood bank, provide health services to people of north Odisha, adjoining districts of Jharkhand and West Bengal. It is a tribal dominated belt.

Around 250 Thalassemics, 50-60 Sickle cell disease patients and haemophiliacs regularly receive blood from this blood bank. Besides, patients admitted to the hospitals and nursing homes for trauma, delivery and related complications, anaemia, planned Surgery and cancer treatment are also dependent on this blood bank.

Objective

The objective of this study is to detect the seroprevalence of various TTIs amongst the blood donors of north Odisha.

MATERIALS AND METHODS

This was a prospective observational study conducted in the Odisha blood bank, Baripada for a period of eight years from 1st January 2010 to 31st December 2017. Donors included in this study were both voluntary and replacement blood donors. Amongst the voluntary groups some were regular donors donating atleast once per annum for consecutive 3 years, rest

*Corresponding author: **Mahesh Biswal**
Department of Pathology Baripada Odisha

were occasional contributors to the voluntary blood donation (VBD) camps. These VBD camps were organized by different voluntary organizations like rotary club, colleges, banks, youth organizations, mela and utsav committees, AmaOdisha, Sri SatyaSaiSevaSamiti and Govt. facilities like JibanBinduprogram etc. The replacement donors donate for their relatives and friends in need of blood.

Eligibility criteria for donors

The donor must be a healthy individual, mentally alert, physically fit, must not be suffering from any disease either communicable or contagious, must not be taking any drugs, hormone etc. His age should be between 18-65 years, weight more than 45 kg, haemoglobin above 12.5 gm%. He or she must not have donated blood within last 3 months in case of males and six months in case of females. All other criteria mentioned in drugs and cosmetic rules had been strictly adhered to.

All the known seropositive donors for these infections (HIV, HBV, HCV, syphilis and malaria) and haemoglobin less than 12.5 g% were deferred and excluded from the study. Informed consent was taken from all donors before blood donation. From donor samples 2ml blood were collected in EDTA and plain vial each for testing. Haemogram was done in automated cell counter. Serum samples were screened for the following.

1. For anti-HIV IgG and IgM antibodies by ELISA method (fourth generation Microlisa kit, Transasia)
2. For HBsAg by ELISA method (HepalisaMicrowell, Transasia)
3. For anti-HCV IgG and IgM by 3rd generation MicrolisaMicrowellELISA, Transasia
4. For Treponemappallidum by RPR card test (Transasia)
5. For malaria by card test (Qualisa)

RESULTS

During last 8 years period total no. of 625VBD camps were held (Table-1). Blood was collected from total 53,786 donors of which 22,217(41.31%) were replacement donors and 31,569 were (58.69%) voluntary donors. Male donors comprised 99.08% (n=48,798) and rest 0.92% (n= 4988) were females. Our donor population was mostly in the age group of 18-30 years.

Table 1 Categorisation of donors

Year	No. of VBD camps	Total collection	No. of replacement collection	No. of voluntary collection	%	Male	Female	% of Female Donors
2010	45	5163	3270	1893	36.6	4925	238	4.6
2011	61	5630	2948	2682	47.6	5143	487	8.6
2012	63	5979	3447	2532	54.0	5401	578	9.7
2013	58	5857	3172	2685	45.8	5245	612	10.4
2014	81	7434	4298	3136	42.7	6672	762	10.2
2015	91	8034	2225	5809	72.3	7392	642	8.0
2016	119	8125	749	7376	90.78	7233	892	11.0
2017	107	7564	2108	5456	72.10	6787	777	10.3
TOTAL	625	53786	22217	31569	58.69	48798	4988	9.28

Prevalence of TTIs (Table-2)

HIV: Seropositivity for HIV gradually increased from 1 in 2010(0.0193%) to 21 in 2017(0.277%) with average of 0.128%.

HbsAg: Ups and downs are maintained. Minimum 0.154% in 2010 and maximum 0.752% in 2012 with average of 0.394% was observed.

HCV: There was a rising trend from 2013 to 2016(maximum-0.344%) with average of 0.120%.

Malaria: Its frequency was variable. Maximum no. of cases was in 2016(0.344%) with an average of 0.113%.

Syphilis (VDRL): It was the most frequently seen TTI amongst our blood donors. It was nil in 2010, more than 1% seen during 2012(1.003%), 2014(1.022%) and 2017(1.097%) with an average of 0.706%.

Table 2 Seropositivity noted year wise and percentage

Year	HIV 1&2	HBsAg	HCV	MP	VDRL	Total %
2010	VM-1 0.0193%	VM-8 0.154%	0	0	0	0.174%
2011	VM-1 0.0177%	VM-14 0.248%	0	VM-5 0.0888%	VM-28 VF-02 0.5328%	0.888%
2012	VM-4 0.0669%	VM-45 0.752%	0	VM-4 0.0669%	VF-03 RM-01 1.003%	1.889%
2013	VM-5 0.0853%	VM-17 VF-2 0.324%	VM-1 0.0170%	0	VM-36 VF-04 RM-02 0.7170%	1.143%
2014	VM-8 0.1076%	VM-26 VF-1 0.363%	VM-4 0.0538%	VM-1 VF-01 0.0269%	VM-73 VF-03 1.0223%	1.573%
2015	VM-9 VF-2 0.1369%	VM-36 VF-5 0.510%	VM-17 VF-01 0.224%	0	VM-38 VF-05 0.5352%	1.406%
2016	VM-15 VF3 221%	VM-28 VF-01 0.356%	VM-25 VF-03 0.344%	VM-24 0.2953%	VM-41 VF-05 0.566%	1.784%
2017	VM-20 VF-1 0.277%	VM-28 VF-01 0.383%	VM-13 VF-01 0.185%	VM-24 VF-02 0.343%	VM-81 VF-02 1.0973%	2.287%
TOTAL	69 0.128%	212 0.394%	65 0.120%	61 0.113%	380 0.706%	1.4632%

VM (voluntary male), VF (voluntary female), RM (replacement male)

DISCUSSION

TTIs threaten the safety of recipients and the community as a whole are a subjects of real concern worldwide. Prevalence of HBV, HCV and HIV among the healthy donors indicates the gravity of disease in the community.

It also estimates the risk or chance of acquisition of these infections through blood transfusion².

In this study majority of the blood donors were male. Out of total 53,786 donors female donors comprised only 0.92%. A predominance of voluntary donors was noted (58.69%). This

could be due to various awareness campaign, Govt's initiatives and encouragements for blood donation program.

Table 3 Comparison of TTI prevalence rate in different parts of India

Place	HIV %	HBsAg %	HCV %	Syphilis %
Ludhiana ³	0.084	0.66	1.09	0.85
Delhi ⁴	0.56	2.23	0.66	
Lucknow (UP) ⁵	0.23	1.96	0.85	0.01
Southern Haryana ⁶	0.3	1.7	1.0	0.9
West Bengal ⁷	0.28	1.46	0.31	0.72
Bangalore ⁸	0.44	1.86	1.02	1.6
Present study	0.128	0.394	0.120	0.706

As shown in Table –3, prevalence of HIV among blood donors in most of the Indian studies varies between 0.084 to 0.56%. In the present study it is 0.128%. Analysis of global prevalence reveals HIV ranges from, 1/2,135,000 in a study conducted in United States⁹ to 0.12% in a study at Nepal¹⁰. A high prevalence of 3.1% in Nigeria¹¹ can be attributed to high risk behavior such as multiple sex partners, intravenous drug abuse and unprotected sexual act.

Prevalence of HBV in this study is 0.394%. On comparison with various studies in India it ranges from 0.66% to 2.23%. Worldwide prevalence of HBV is very diverse ranging from 1/2,70,000 in United States⁹ to 8.1% in Nigeria¹¹ and Mangolia¹².

Our study reveals prevalence of HCV 0.120%, which is lower in comparison to other Indian studies that ranges from 0.31% to 1.09%. This may be due to lower HCV prevalence in the study population. Global prevalence of HCV appears much higher in various studies, 6% in Nigeria¹¹, 8.7% in Mangolia¹², whereas it is 0.64% in Nepal¹⁰.

Prevalence of syphilis as TTIs ranges from 0.01% to 1.6% in various studies conducted in India (Table-3). Present study shows 0.706%. Global prevalence reveals 1.1% in Nigeria and 2% in Mangolia in different studies.

Malaria prevalence in this study was 0.113% among the donors. A study from Mangalore, India shows 0.01%¹³. Global prevalence reveals very high figure, 16.5% in south Cameroon¹⁴ and 30.2% in Nigeria¹⁵ in two different studies.

Thus, the present study reveals the status of transfusion transmitted disease incidence in both voluntary (58.69%) and replacement (41.31%) donors. Screening by higher generation ELISA and diagnostic Cards with high sensitivity and specificity is required for accurate result needed for further management and prevention of TTIs.

CONCLUSION

To conclude syphilis is the commonest TTI among apparently healthy donors, followed by HBV, HIV and HCV. About 1.46% of healthy donors are seropositive for TTIs and are potential of transmitting them through transfusion. Proper implementation of strict donor selection criteria along with use of higher generation ELISA kits and avoiding rapid screening methods are key to accurate diagnosis. The risk of TTI from "window period" or low viremia can be avoided with advancement in technologies like NAT-PCR which should be provided to all the blood banks.

Conflict of Interest- The authors declare no conflict of interests

References

1. Widman FK, 1985. Technical manual, American Association of Blood Bank, Arington, p 325-344.
2. Yadav B S, Varma A V, Singh P et al. Seroprevalence of transfusion transmitted infections in blood donors: a study from central India. *Int J Med Sci & Pub Health*, 2016; 5(6):1158-1162.
3. Gupta N, Kumar V, Kaur A. Seroprevalence of HIV, HBV, HCV and syphilis in voluntary blood donors. *Ind J Med Sci* 2004; 58:255-257.
4. Phauja 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.
5. Chandra T, Kumar A, Gupta A. Prevalence of transfusion transmitted infection in blood donors: an Indian experience. *Trop Doct* 2009; 39:152-154.
6. Arora D, Arora B, Khetarpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in southern Haryana. *Ind J Pathol Microbiol* 2010; 53:308-309.
7. Bhattacharya P, Chakraborty S, Basu S K. 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* 2007; 13:3730-3733.
8. Srikrishna A, Sitalaxmi S, Damodhar P. How safe are our safe donors. *Ind J Pathol Microbiol* 1999; 42:411-416.
9. Zou S, Dorsey KA, Notary EP, Foster GA, Krysztof DE, Musavi F et al. Prevalence, incidence and residual risk of human immunodeficiency virus and hepatitis C virus infections among United States blood donors since the introduction of nucleic acid testing. *Transfusion* 2010; 50(7):1495-504.
10. Shrestha AC, Ghimire P, Tiwari BR, Rajkarnikar M. Transfusion transmissible infections among blood donors in Kathmandu, Nepal. *J Infect Dev Ctries* 2009; 3(10):794-7.
11. Buseri FI, Muhibi MA, Jeremiale ZA. Seroepidemiology of transfusion transmissible infectious diseases among blood donors in Osoglor, southwest Nigeria. *Blood Transfus* 2009; 7:293-9.
12. Terenpuntsag B, Oupbileg L, Nelson K, McNutt LA. Prevalence of infectious diseases among Mangolian blood donors. *J Infect Dev Ctries* 2008; 2(1):73-5.
13. Fernandes H, D'Souza PF, D'Souza PM. Prevalence of transfusion transmitted infection in voluntary and replacement donors. *Ind J Hematol Blood Transfus* 2010; 26(3):89-91.
14. Ali MSM, Kadaru AAGMY, Mustafa MS. Screening blood donors for Malaria parasite in Sudan. *Ethiop J Health Dev* 2004; 18(2):70-4.
15. Okocha EC, Ibeh CC, Ele PU, Ibeh NC. The prevalence of malaria parasitemia in blood donors in a Nigerian teaching hospital. *J Vector Borne Dis* 2005; 42(1):21-4.
