Content available at: iponlinejournal.com

IP Journal of Diagnostic Pathology and Oncology

Journal homepage: www.innovativepublication.com

Original Research Article

Study of transfusion transmissible infections in donors in a tertiary care hospital in North Karnataka region

S. B Shivashetty[1], Md. Hamed Altaf Mali[1,*]

[1] *Dept. of Pathology, Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, India*

ARTICLE INFO

Article history:
Received 14-10-2019
Accepted 09-11-2019
Available online 12-12-2019

Keywords:
Blood donors
Transfusion transmissible infections
Seropositivity

ABSTRACT

Introduction: Blood safety comprises provisions of safe, adequate and quality blood and its components to the needy patients. Blood transfusion is a double edge sword which involves life saving of patients and also subjected to risk of transfusion transmissible infections such as HIV, HBV, HCV, syphilis etc. This risk has been reduced dramatically by routine screening of blood donors .
Objective: To study the serological prevalence of transfusion transmissible infections among donors and to find any correlation between these infections and blood groups.
Materials and Methods : This study was conducted for a period of three years (JAN 2016- DEC2018), carried out in blood bank of Basaveshwara Teaching and General Hospital, Kalaburagi in North Karnataka. A total of 13249 donors were analysed for transfusion transmitted infections.
Results: Total of 13249 donors were screened during the study period and 253 donors were found seropositive for transfusion transmissible infections (1.88%). In which, maximum 237 donors were positive for HBV (1.78%), followed by 12 with HIV(0.090%), 3 with malaria (0.022%) and 1 with HCV (0.0079%) respectively. Seropositive for HBV was more common in B blood group donors, while HIV+ was maximum in A blood group donors and only 1 case of HCV was seen in AB blood group.
Conclusion: The results of this study are comparable to various other studies done in India. There was no significant association between various blood group antigens and 2 transfusion transmissible infections. Voluntary donations are safer as compared to replacement ones and should be encouraged. Efforts should me made to increase the awareness regarding voluntary blood donation in the local population.

1. Introduction

Transfusion-transmissible infections have been a major concern in transfusion medicine.[1] Blood safety comprises provisions of safe, adequate and quality blood and its components to the needy patients. Safe blood transfusions remain a challenge in resource-limited settings.[2,3] Blood transfusion is a double edge sword which involves life saving of patients and also subjected to risk of transfusion trans missible infections such as HIV (Human Immunodeficiency Virus), HBV (Hepatitis B virus), HCV(Hepatitis C virus), syphilis etc. This risk has been reduced dramatically by routine screening of blood donors in blood banks.[3]

Although blood transfusion saves millions of lives worldwide each year, recipients of transfusions risk becoming infected with blood-borne pathogens such as HBV, HCV and HIV etc.[4] Monitoring the trends in the residual risks of transfusion-transmitted infections and the incidence of transmissible agents in blood donations provides a way for evaluating the safety of the blood supply.[4]

In this study, we present the prevalence of HBV, HCV, HIV, syphilis and malaria among voluntary and replacement blood donors in north Karnataka region for a period of three years 3 from January 2016 till December 2018. Also to find any correlation between these infections and blood groups.

* *Corresponding author*.
E-mail address: hamedaltaf24@gmail.com (M. H. A. Mali).

https://doi.org/10.18231/j.jdpo.2019.058

2. Materials and Methods

This is a retrospective type of observational study done for a period of three years (January 2016- December 2018), carried out in blood bank of Basaveshwara Teaching and General hospital attached to M.R Medical College Kalaburagi in North Karnataka, India. A total of 13249 donors were analysed for transfusion transmitted infections. Data were retrieved from blood bank records including donors age, sex, ABO blood group, Rh type and results of serological tests performed.

The criteria for prospective blood donor selection and deferral were done according to Drugs and Cosmetic Act 1940 & Rules 1945 supplemented by the Standards for Blood Banks and Blood Transfusion Services by National AIDS Control Organisation(NACO) and Transfusion Medicine Technical Manual by Ministry of Health and Family Welfare(MoHFW), Government of India (GOI).

After taking proper 'health history', a limited general physical examination was done measuring pulse, blood pressure, temp erature, weight and haemoglobin(hb). Screening for haemoglobin was done by specific gravity method by copper sulphate solution. It was re- checked by Abacus 3 part cell counter in case of query in any donor. The prospective blood donors were accepted or deferred (temporarily or permanently) according to standard operating procedure.

Reasons for temporal deferrals were low haemoglobin, under weight, hypertension, jaundice, uncontrolled diabetes, pregnant women, recent surgery, low blood pressure and previous blood donations within three months. Permanent deferrals were done if donors were 4 seropositive for HIV, HBV and HCV and also if donors were having any cardiac problems, chronic renal disorders or any malignancy.

Serological screening of all 13249 donors had been done for Hepatitis B surface antigen (HBsAg), Hepatitis C Virus antibodies(Anti-HCV), Human Immunodeficiency Virus antibodies-1,2 (anti-HIV 1, 2), Treponema pallidum haemagglutination test (TPHA) for syphilis and Malaria parasite antigen test (MP). All tests had been performed by using NACO (National AIDS control organisation) approved rapid kits and followed by third generation ELISA (Enzyme linked immunosorbent assay) .

3. Results

Total of 13249 donors were screened during the study period of three years. Maximum donors were in 2016(Table 1). The voluntary donors were 7570(57.13%) and replacement donors were 5679(42.87%) respectively (Table 2). During study period the amount of blood and its components issued from the blood bank were also studied which includes whole blood, packed cell volume, platelet rich plasma and fresh frozen plasma (Table 3). Then the donated blood was screened for seropositivity for transfusion transmissible infections. Out of 13249 donors, the 253 donors were found seropositive for transfusion transmissible infections (1.88%). In which maximum 237 donors were positive for HBV (1.78%), followed by 12-HIV (0.090%), malaria 3 cases (0.022%) and 1-HCV(0.0079%). None of the donor were seropositive for syphilis. (Figure 1). Table 5 showing seropositive for transfusion transimissible infections in various blood groups.[5]

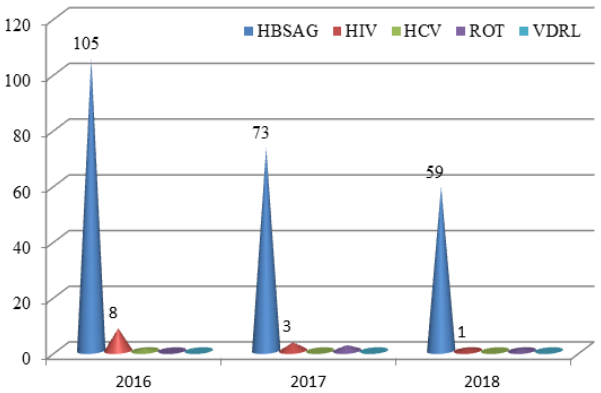

Fig. 1: Graphical representation of year wise distribution of transfusion transmissable infections

4. Discussion

Blood transfusion is one of the most important therapeutic options of life-saving intervention for recipients that are in diseased or non-diseased conditions with severe blood loss. However, it is associated with many risks, which can lead to adverse consequences that may cause acute or delayed complications and bring the risk of transfusion-transmissible infections including HIV, hepatitis B and hepatitis C and syphilis.[1]

Hepatitis B is one of most common infectious diseases of the world infecting about two billion people of which an estimated 350 million chronically infected cases have been reported so far.[2] Hepatitis C virus infection is another common chronic blood-borne infection with an estimated 3.9 million persons infected with the virus and with a positive correlation with the onset and progression of liver cirrhosis. Infections by hepatitis B virus(HBV) and hepatitis C virus (HCV) cause serious mortality, morbidity as well as financial burden and are thus a major global health problem.[4] Each year, up to four million blood donations worldwide are not tested for human immunodeficiency virus(HIV) and few are tested for hepatitis B and hepatitis C viruses (HBV and HCV, respectively).[5]

In our study hepatitis B was the most common infection followed by HIV in transfusion transmissible infections. Three cases were positive for malarial pararsite and only one case of 9 HCV was found over a period of three

Table 1: Year wise distribution of donors

Year	Total	Percentage
2016	6010	45.36%
2017	4102	30.96%
2018	3137	23.67%
Total	**13249**	**100%**

Table 2: Types of distribution of donors

Donors	2016	2017	2018	Total	Percentage
Total voluntary donors	4028	1787	1755	7570	57.13%
Total replacement donors	1982	2315	1382	5679	42.87%
Total	**6010**	**4102**	**3137**	**13249**	**100%**

Table 3: Total number of blood components issued during study period

Year	Whole blood	Packed cell volume	Platelet rich plasma	Fresh frozen plasma	Total
2016	1587	2064	142	236	4029
2017	2658	1404	141	253	4456
2018	1980	1432	82	354	3848
Total	6225	4900	365	843	12333

Table 4: Transfusion transmitted infections positivity according to blood group

Blood group	HBV +	HIV+	HCV+	MP antigen+	Syphilis+	Total
A	68	04	–	01	–	73
B	72	02	–	01	–	75
AB	54	03	01	–	–	58
O	43	03	–	01	–	47
Total	**237**	**12**	**1**	**3**	**0**	**253**

Chi square is 1.41, p =0.99,(> 0.05) - not significant

Table 5: Comparison of seropositivity with other studies

Authors	Hiv	Hbv	Hcv	Syphilis	Malaria
Chandra et al(2009)	0.23%	1.90%	0.85%	0.01%	–
Dharg et al (2011)	0.01%	0.08%	0.1%	0.1%	–
Kumar et al(2012)	0.017%	1.58%	0.09%	0.01%	–
Chetna et al(2013)	0.03%	1.57%	0.04%	0.04%	–
Vaibhav et al(2013)	1.31%	1.74%	0.54%	0.6%	0.12%
Present study(2018)	0.090%	1.78%	0.0079%	–	0.022%

years. The maximum number of donors were in 2016 and hence maximum seropositive donors for HBV and HIV was also in 2016. While HBV+ was more common in B blood group donors, HIV+ was maximum in A blood group and only 1 case of HCV was seen in AB blood group. The seropositivity was not related to any specific blood group and p- value was more then 0.05 (not significant). Since majority of the donors were male so all seropositive donors were male. The HBV positivity in this study goes correlates well with study done by Vaibhav et al in 2013 and HIV positivity with study done by Kumar et al in 2012. Three positive cases for malarial parasite were also encountered in this study which correlates with study done by Vaibhav et al(2013) (Table 5)

5. Conclusion

The results of this study are comparable to various other studies done in India. There was no significant association between blood group antigens and transfusion transmissible infections. Voluntary donations are safer as compared to replacement ones and should be encouraged.10 Efforts should be made to increase the number of voluntary donors and reduce replacement donations to a minimum. 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. There is need for high sensitive donor screening techniques to enable the detection of Transfusion related transmissible infections.

Efforts should be made to motivate and increase the awareness regarding voluntary blood donation in the local population. Transmission of Transfusion Transmissible I nfections during serologically negative window period still poses a threat to blood donor safety. Therefore strict selection of blood donors and comprehensive screening of donor's blood using standard methods are highly recommended to ensure the safety of blood for recipient.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Nadjir LK, Kolou M, Katawa G, Kwarteng AK, Issa AR, et al. Seroprevalence of hepatitis B virus, hepatitis C virus, and human immunodeficiency virus among volunteer blood donors in the National Blood Transfusion Center of Lom. *Int J Blood Transfus Immunohematol*. 2017;7:41–45.
2. Ohsaka A. A Mini Review on Electronic Verification for Blood Transfusion. *J Blood Transfusions Dis*. 2019;2(1):48–51.
3. Ekwere TA, Ino-Ekanem M, Motilewa OO. Iquo Augustine Ibanga. Pattern of blood donor deferral in a tertiary hospital, South-south, Nigeria: A three-year study review. *Int J Blood Transfus Immunohematol*. 2014;4:7–13.
4. Sapkota A, Poudel S, Sedhain A, and Khatiwada N. *J Blood Transfus*. 2018;Article ID 6190859. Available from: https://doi.org/10.1155/2018/6190859.
5. World Health Organization, Global Status Report on Blood Safety and Availability ; 2016,2017,. Available from: http://apps.who.int/iris/bitstream/10665/254987/1/9789241565431-eng.pdf..

Author biography

S. B Shivashetty Associate Professor

Md. Hamed Altaf Mali Post Graduate Student

Cite this article: Shivashetty SB, Mali MHA. Study of transfusion transmissible infections in donors in a tertiary care hospital in North Karnataka region. *J Diagn Pathol Oncol* 2019;4(4):278-281.