



Transfusion transmissible infections in blood donors in central India at Indore: A 7 year study

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Introduction

Blood transfusions are inevitable element of modern medicine. Simultaneously, it is not a risk free procedure. It is associated with transfusion transmissible infections (TTIs) and transfusion reactions. Approximately, 1% of transfusions are associated with adverse events.^[1] TTIs include human immunodeficiency virus (HIV), hepatitis B surface antigen (HBsAg), hepatitis C virus (HCV), Syphilis and Malaria. Outcome of TTIs ranges from subclinical to life-threatening manifestations of diseases. Various testings are helpful to reduce TTIs, but not up to 100%. There is always chance of false-negative due to detection limitation of kits used and “window period” of diseases. Minimizing its use and taking donation from low risk population for TTIs are some of the modalities used for reduction for adverse events associated with blood transfusions.

Aims and Objectives

The aim of this study was to determine the prevalence of TTIs in blood donors, voluntary as well as replacement and to evaluate trends in TTIs in blood donors.

Materials and Methods

Pre transfusion screening for TTIs were carried out on 164562 blood units taken from voluntary donors (VDs) and replacement donors (RDs) by Department of Pathology M.G.M. Medical College Indore and M.Y. Hospital blood bank. This is a retrospective study that was conducted, during the period 2012-2018. All voluntary or replacement blood donors who were eligible to donate blood and blood components as per the Drugs & Cosmetics act, 1940^[8] and rules. The data collected from donor register record book, donors form, master record book, HIV, HBV and HCV positive bag number records included the demographic characteristics of donors such as age, gender, residence.

Pilot tubes were taken for screening of TTIs. The screening for HIV was done by ELISA using kits. HBS Ag was detected by ELISA. Anti-HCV test was done by ELISA. ABO and Rhesus (Rh) blood groups were determined using blood grouping antisera: anti-A, anti-B, anti-AB, and anti-D. Selection of cases for the study included the donors of MYH Blood Bank. For HBV, the marker used for routine screening was hepatitis B surface antigen (HBsAg). The test was performed

using solid phase enzyme linked immunosorbent assay (ELISA) based on Direct Sandwich principle and the ELISA kit. For HCV, anti HCV (IgG) ELISA was performed using third generation ELISA test. The ELISA tests were performed as per the manufacturer's instructions along with validity check and incorporation of internal controls in each run. Samples positive for HBsAg antigen &/or anti HCV antibody by first test were retested by rapid test for HbsAg and HCV IgG antibodies using chromatographic immunoassay All borderline samples were tested in duplicate and if both duplicate retest sample absorbance value was less than the cut off value, the specimen was considered non-reactive. If any one of the duplicate retest absorbance value was found to be equal to or greater than the cut off, the specimen was considered to be reactive for HBsAg/HCV Ig G antibodies. Screening for syphilis was done by Rapid Plasma Reagin (RPR) method. Data were entered into Microsoft Excel Sheet and calculated for prevalence and trend.

Results

A total of 164562 blood donations were taken during the period of 2012-2018 at Department of Pathology M.G.M. Medical College Indore and M.Y. Hospital blood bank. Out of which 89.8% (147782) were VDs (voluntary donors) and 10.19% (16780) were RDs (replacement donors). The seroprevalence of HIV, HBV, HCV, syphilis and malaria was found to be 0.08%, 1.29%, 0.07%, 0.34% and 0.002%.

Table 1 Distribution in replacement donors, voluntary donors, and total blood donations

Years	RDs	VDs	Total donations
2018	2635	28701	31336
2017	2452	24562	27014
2016	2263	24567	26830
2015	1995	19251	21246
2014	2055	19617	21672
2013	2001	17012	19013
2012	3379	14072	17451
Total	16780	147782	164562

Table 2 Seroprevalence of HIV, HBsAg, HCV, Syphilis and malaria

Years	HIV	HBsAg	HCV	Syphilis	Malaria
2018	20	358	20	140	01
2017	23	315	13	138	01
2016	15	297	12	52	00
2015	13	242	12	23	01
2014	17	293	03	110	00
2013	16	315	27	77	00
2012	31	307	37	35	01
Prevalence	0.0%8%	1.29%	0.07%	0.34	0.002%

Discussion

Table 3: TTI prevalence in India

Comparison of TTI prevalence rate in different parts of India 2					
Place	HIV%	HBsAg%	HCV%	SYPHILIS%	Reference
Ludhiana	0.084	0.66	1.09	0.85	Gupta N. et al (2004) 3
Delhi	0.56	2.23	0.66		Pahuja S et al(2007) 4
Lucknow (UP)	0.23	1.96	0.85	0.01	Chandra T et al (2009) 5
Southern Haryana	0.3	1.7	1.0	0.9	Arora D et al (2010) 6
West Bengal	0.28	1.46	0.31	0.72	Bhattacharya P et al (2007),
Bangalore, Karnataka	0.44	1.86	1.02	1.6	Srikrishna A et al(1999) ,7
Present study	0.08	1.29	0.07	0.34	

There is significantly lower incidence of HIV and HCV comparable to other studies while seroprevalence of HBsAg and Syphilis found to be comparable to other studies.

Conclusion

The present study clearly showed a high prevalence of transfusion-transmissible infection among blood donors in the studied population.

There is a need for stringent selection of blood donors with the emphasis on getting voluntary donations and comprehensive screening of donors for TTIs.

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