



ORIGINAL RESEARCH PAPER

Pathology

PREVALENCE OF TRANSFUSION TRANSMISSIBLE INFECTONS AMONG VOLUNTARY BLOOD DONORS IN A TERTIARY CARE HOSPITAL IN TAMIL NADU

KEY WORDS: Hepatitis B, Hepatitis C ,Transfusion transmissible infections.

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ABSTRACT

Introduction: Safe blood transfusion is of primary importance in transfusion medicine to prevent transfusion transmissible infections.
Aim: The aim of the study is to determine the prevalence of transfusion transmissible infections (TTI) in the blood bank of a tertiary care hospital.
Materials and methods: This is a prospective study conducted in the blood bank of Govt.Mohan Kumaramangalam Medical College, Salem, Tamil Nadu for a period of three years from January 2016 to December 2018.
Results: The number of voluntary donors during the study period were 50,760 of which 279 cases were seropositive for Transfusion Transmissible Infections(TTI). 248 cases (0.49%) were positive for Hepatitis B(HBV), 16(0.03%) were positive for Hepatitis C(HCV), 2(0.004%) were positive for coinfection with HBV and HCV, 11 cases (0.02%) were positive for HIV, 2 cases (0.004%) were positive for VDRL test. No case of malaria was detected.
Conclusion: Screening of blood donors is mandatory to prevent Transfusion Transmissible Infections.

INTRODUCTION:

Blood transfusion is an important life saving intervention in the field of medicine. It has seen a dramatic change in the process of selection of donors, collection of blood, screening, storage and administration in the last few decades. Though it is life saving procedure, the major disadvantage of blood and blood components transfusion is transfusion transmissible infections (TTI).

Transfusion transmissible infections are described as microbial agents that are transmissible by blood transfusion and can cause morbidity and mortality in the recipients⁽¹⁾. Screening and categorizing the four infections namely Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBS), Hepatitis C virus (HCV), Syphilis and malaria are mandatory. These infections cause chronic illness and life threatening complication to the recipients. The infected donors are apparently healthy or may have milder symptoms so that they cannot be identified during donor selection process⁽²⁾. So it is very much necessary to follow a screening test which can detect the antigen even at low titer.

The incidence of transfusion transmissible infections greatly varies from country to country. The prevalence of Hepatitis B and Hepatitis C carrier rate in India is 1-5 % and 1 % respectively and India has been categorised under intermediate endemic zone for HBS infection⁽³⁾. The estimated risk of receiving contaminated blood is 1-2 per 1000 recipients in the world⁽³⁾.

Our study is to analyse the prevalence of TTI among the voluntary blood donors in the tertiary care hospital, Salem, Tamil Nadu for the period of three years from 2016 to 2018.

MATERIALS AND METHODS:

It is a prospective study conducted in the Blood Bank of Government Mohan Kumaramangalam Medical college, Salem, Tamil Nadu, India for a period of three years from January 2016 to December 2018. WHO guidelines were followed for donor selection.

Exclusion criteria:

Age less than 18 and more than 60 years, weight less than 45 kg, anemia, pregnancy, lactation, jaundice, fever, using prohibited drugs, history of major surgery, recent blood transfusion, chronic illness, bleeding diathesis, cardiovascular and pulmonary illness, malignancy.

Five ml of unscreened donated blood was taken in a test tube, centrifuged at 2500 rotation per minute for five minutes. The plasma thus separated was tested for antibodies for HIV 1 and HIV2, HBS,HCV using Enzyme Linked Immunosorbent Assay (ELISA), for syphilis using Rapid Plasma reagen card test, for malaria using Leishman stained thin smear examination. The samples that showed positive were labelled as seropositive and then discarded.

RESULTS:

Total number of donors in the three years of study period were 50,760, of which males comprise 96.3% (48,897 cases), females 3.7% (1863 cases). Among the total donors, 279 cases were seropositive, in which males formed the majority, 272 cases (97.4%), and minor group of females around 7 cases (2.5%). On observing the total number of seropositive cases over the years, it shows an increasing trend from 2016 (57 cases), 2017 (96 cases) and 2018 (126 cases). This may be due to increase in the number of total donors proportionately.

Table 1: Total number of donors with male, female distribution

YEAR	TOTAL NO OF DONORS	MALE	FEMALE
2016	13552	13088	464
2017	17225	16736	489
2018	19983	19073	910
TOTAL	50760	48897	1863

Figure:1 Total number of positive cases with male ,female distribution

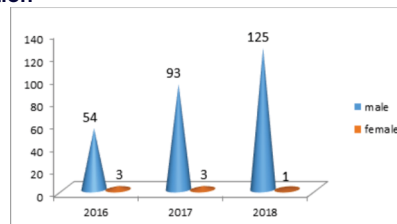


Table 2: Cases wise distribution

YEAR	HBS		HCV		CO-INFECTION (HBS & HCV)		HIV		VDRL		MALARIA	
	M	F	M	F	M	F	M	F	M	F	M	F

2016	52	3	-	-	-	-	1	-	1	-	-	-
2017	78	2	10	-	2	-	3	-	1	-	-	-
2018	113	-	6	-	-	-	6	1	-	-	-	-
TOTAL	243	5	16		2	-	10	1	2		-	-
%	0.4	0.2	0.0		0.004		0.02	0.0	0.00			
	9	6	3					5	4			

On categorising the seropositive cases, 248 cases were HBS positive of which males comprise 97.9%, females 2%.HCV positive cases were 16(100% males)and co-infection with HBS and HCV were 2 cases , both were males .Total number of HIV positive cases were 11 , males comprised 99 % and females 1% .

Total number of syphilis positive cases were only 2(both were males). No case of malaria was positive during the three years, even on thorough examination of slides.

DISCUSSION:

Transfusion transmissible infections are a major threat in the field of transfusion medicine worldwide. These infectious agents when present in our body can produce antibodies against them, or several antigenic markers in the blood stream which are detected by various screening tests.

During the study period the number of donors were 50,760 of which 96.3% were males The sero prevalence of HIV in our study is 0.02%. Sheetal arora et al⁽⁴⁾ reported HIV prevalence of 0.82% in the year 2017 in their study at New Delhi. The study conducted by Rajesh kumar et al in the year 2015 in Ludhiana⁽⁵⁾, Punjab shows the seroprevalence of HIV as 0.26%, 0.081 % prevalence rate of HIV was documented in the study by Gobi .H dobariya et al in Gujarat⁽⁶⁾in the year 2016.

Our study shows the prevalence of HBV infection as 0.49% among the male donors and 0.01% among the female donors. Our study shows the highest prevalence of HBV infection when compared to all other TTI. This high prevalence may be due to lack of awareness of vaccination against HBS in our area. The prevalence rate of HBS infection in the present study is lower when compared to 0.97%⁽⁵⁾, 0.82%⁽³⁾, 1%⁽³⁾, 1.7%⁽⁷⁾, 1.03%⁽⁴⁾ in other studies.

The prevalence rate of Hepatitis C infection in our study is seen in male donors only,0.03%. None of the female donors showed positivity for anti HCV. This may be due to lower number of female donors when compared to males. Our prevalence rate of HCV is similar to the 0.04 % prevalence of study done by Radhika et al⁽³⁾. Other studies show higher prevalence rate as follows :0.09%⁽⁶⁾, 0.56%⁽⁷⁾, 0.42%⁽⁴⁾, highest 1.53%⁽⁵⁾.

In the total study period of three years syphilis positive cases were only two contributing 0.004% among the total male donors. Our prevalence rate for syphilis is very less when compared to other studies conducted over the same time period. Other studies show a rate of 1.74%⁽⁵⁾, 0.16%⁽⁶⁾, 0.8%⁽⁴⁾, and 0.07 %⁽³⁾.

No case of malaria was detected in our study.Only few studies have documented the prevalence rate of malaria as 0.02%⁽⁶⁾ and 0.006%⁽⁵⁾.

Post transfusion HBV and HCV rate in India is around 10%. In spite of screening for HBV,HCV, and HIV infections, the risk of reducing the TTI to zero is difficult. In order to achieve zero transmission rate, it is important to adopt stringent donor selection process, and use of screening tests with high sensitivity. But each infection has its own window period. So the donor blood even though tested and declared as seronegative is still infectious. Such seronegative samples can still be tested by Nucleic acid Amplification technique for HIV, HBS, and HCV. This Nucleic Acid Amplification technique (NAT) reduces the window period from weeks to very few days. With NAT, the window period is reduced to less than 11 days for HBV, less than 2 days for HCV, and less than 3 days for HIV⁽⁸⁾.

Use of NAT test is the best way to reduce the risk to much lower level but the cost of each test is still not affordable in the developing nations like India⁽⁹⁾

CONCLUSION:

Increasing the public awareness regarding TTI, practising self exclusion by the donors is helpful to reduce the burden of TTI. Also using screening tests like NAT will still reduce the risk of TTI towards zero.

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