

## SEROPREVALENCE OF DIFFERENT TRANSFUSION TRANSMISSIBLE INFECTIONS AMONG THE VOLUNTARY BLOOD DONORS IN A TERTIARY CARE HOSPITAL OF KASHMIR- A HOSPITAL BASED STUDY

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### ABSTRACT

Blood transfusion saves millions of lives. While transfusion of blood and blood components has become a specialized modality of patient management and helps to reduce morbidity, an integrated strategy for blood safety is required for elimination of transfusion transmissible infections (TTIs) and or provision of safe and adequate blood transfusion services to the people. The objective of the present study was to assess the prevalence of sero- positive TTIs among the blood donors in SMHS Hospital-an associated hospital of Govt. Medical College Srinagar, Kashmir. Retrospective analysis for a period of two years from Jan 2015 to Dec 2016 of the donated blood units which were tested for five TTIs in department of Transfusion Medicine was carried out. As per data available, sero-prevalence of HBV, HCV, HIV, Syphilis and Malaria was found to be 0.3 %, 0.24 %, 0.02 %, 0.007 % and 0.00% respectively. Sero-prevalence was highest for HBV followed by HCV, HIV and least for Syphilis and Malaria. Therefore, it is very important to continue screening of donated blood with highly sensitive and specific tests, to counsel donors who are positive to any of the above diseases or infections and conduct extensive public awareness programmes to make transfusion of blood and blood components safe.

**KEYWORDS:** Transfusion, Sero-prevalence, Donors, Transfusion Transmissible Infections

Blood transfusion plays an important role in the supportive care of medical and surgical patients (Diro, 2008). Amongst the undesirable complications, transmission of certain infections like HIV, HBV, HCV and syphilis are most significant for the long term detrimental side effects (Pallavi, 2011). TTIs have a wide spectrum of presentations like acute and fatal stage, chronic stage, prolonged infective stage and chronic carrier stage which produces serious long term consequences (Wallace, 2006). Morbidity and mortality resulting from transfusion of infected blood have far reaching consequences, not only for the recipient, but also for their families, their communities and the wide society (Iiwari, 2008). Meticulous pretransfusion testing and screening for TTI is the need off the hour. Only continuous improvement and implementation of donor selection, sensitive screening tests and effective inactivation procedures can ensure the elimination or at least reduction of the risk of acquiring TTIs. Transfusion departments have always been a major portal to screen, monitor and control infections transmitted by transfusion of blood. Blood transfusion departments not only screen TTIs but also give clue about the prevalence of these infections in populations

(Khan, 2007). This hospital based study was undertaken to study the sero-prevalence of TTIs for a period of 2 years in a tertiary care hospital. This gave vital information about the safety associated with blood transfusion and an accurate measurement of risks verses benefits of blood transfusion.

### MATERIALS AND METHODS

This retrospective study was conducted after getting permission from the institutional ethical committee of GMC Srinagar. We collected, retrospectively, the data of the donors who came to donate at Govt. Medical College & SMHS Hospital and various blood donation drives organized by Dept. of Transfusion Medicine. A total of 14786 samples received during year 2015 & 2016 were tested for the presence of sero-markers of TTIs. We had selected the donors strictly by donor selection criteria from whom a detailed history had been taken, clinical examination was done, had donor questionnaire forms filled and gave written consent for blood donation. All the 14786 samples received during the year 2015 to 2016 were tested for the presence of seromarkers of TTI's. HBsAg and Anti- HCV antibodies were tested by 3<sup>rd</sup> generation Hepalisa and Microlisa kits

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supplied by Mitra & Co. Pvt. Ltd. and HIV1&2 antibodies were tested by using 4<sup>th</sup> generation Microlisa kits by Mitra & Co. Pvt. Ltd. (Specific for both HIVAg+Ab). Syphilis was tested by RPR Carbond Ag Kits supplied by Reckon Diagnostics Pvt. Ltd.) and Malaria was tested by rapid malaria antigen kits followed by slide examination for confirmation. The kits used were all NACO approved and standard protocols were followed. The positive samples were discarded as per standard protocols. Counseling was given to reactive donors who were advised to start treatment and take precautions by which spreading of infection can stop.

## RESULTS

From the data, 14786 units of blood were collected from Jan 2015 till Dec 2016 among which 786 blood units were discarded being inadequate, hemolysed and phlebotomy collections. Total blood units screened were 14000 in two years retrospectively. All the screened units were from voluntary blood donors and female donors were very less. From our results, 46 cases were found positive for

various TTIs in a total of 6800 collections for year 2015 with a percentage of 0.67 %. Similarly 35 cases were found to be positive with different TTIs in a total collection of 7200 for year 2016 with a percentage of 0.48%. Taken together, for a two year period, a total of 81 positive cases were reported in a total collection of 14000, giving overall two year percentage of 0.57 %. The data is also depicted in Table 1.

**Table 1: Over all Seroprevalence of TTIs in blood units screened for a period of 2 years**

Year	No of blood units screened	TTI positive cases	%age of positive cases
2015	6800	46	0.67 %
2016	7200	35	0.48 %
Total	14000	81	0.57 %

Seroprevalence of different TTIs for a two year period depicted in Table 2 shows HBV tops the list with a percentage of (0.3 %) followed by HCV (0.24 %), HIV (0.02%), syphilis (0.007 %) and malaria (0%).

**Table 2: Seroprevalence of different TTIs among blood donors for a two year period**

Type of TTI	Total TTI positive cases in two years	Total No of blood units screened in two year period	% of positive cases
HBV	43	14000	0.30 %
HCV	34	14000	0.24 %
HIV	03	14000	0.02 %
Syphilis	01	14000	0.007 %
Malaria	00	14000	0.00 %

Same trends in Seroprevalence of different TTIs can also be seen in year wise break up for 2015 & 2016

showing HBV contributing maximally to the infections transmitted by blood transfusion (Table 3).

**Table 3: Percentage of Seroprevalence of different TTIs in a year wise break up for 2015 and 2016.**

Type of TTI	Year 2015			Year 2016		
	Total Collection	Total+ve cases	% of positive cases	Total Collection	Total+ve cases	% of positive cases
HBV	6800	27	0.39%	7200	16	0.22%
HCV	6800	16	0.22%	7200	18	0.25%
HIV	6800	3	0.04%	7200	0	0%
Syphilis	6800	0	0%	7200	1	0.013%
Malaria	6800	0	0%	7200	0	0%

Among the positive cases reported in a two year period, the highest percentage of 53.08% was contributed by

HBV, followed 41.97% by HCV, 3.7% by HIV positive cases, 1.23 % by syphilis & 0.00 % by Malaria (Table 4).

**Table 4: Percentage of Seroprevalence of different TTIs among positive cases for a two year period**

Type of TTI	Total TTI positive cases in two years	Total +ve cases for TTIs in 2 years	% of positive cases
HBV	43	81	53.08 %
HCV	34	81	41.97 %
HIV	03	81	3.7 %
Syphilis	01	81	1.23 %
Malaria	00	81	0.00 %

The comparative data presenting a picture of TTI burden in India has come from the present and various other

Seroprevalence studies done in different parts of the country and is depicted in Table 5.

**Table 5: Comparison of present study with other similar studies showing TTI prevalence in different parts of India.**

	HBV	HCV	HIV	Syphilis	Malaria
Present Study	0.3 %	0.24 %	0.02 %	0.007 %	0.00 %
Gujrat India Gawravi et al	0.68 %	0.74 %	0.074 %	0.065 %	0.37 %
West Bengal Bhatt achorya et al	1.46 %	031 %	0.28 %	0.72 %	
Southern Haryana Arora et al	1.7 %	1.00 %	0.3 %	0.9 %	
Lucknow Chandro et al	1.96 %	0.85 %	0.23 %	0.01 %	
Banglore Sri Krishna et al	1.86 %	1.02 %	0.44 %	1.6 %	

The results of our study are comparable with results of most of these studies showing that sero-positivity of HBV and HCV is much greater than sero-prevalence of other TTIs which can be attributed to greater endemicity for these two infections. Also Seropositivity was very less for HIV and Syphilis in our study which can be attributed to strong religious beliefs and life styles of the residents of this particular area. Malarial infection was almost negligible due to lack of endemicity in Kashmir.

## DISCUSSION AND CONCLUSION

Each unit of blood is associated with 1% chance of TTIs and transfusion related reactions. One of the primary tools to determine the seroprevalence of various TTI's are serosurveys. Evaluation of serosurveys helps in estimating the safety and efficacy of blood and its products and also

gives us an idea regarding epidemiology of these diseases in the community (Singh, 2009). Screening for TTIs to exclude blood donations at risk of transmitting infections from donors to recipients is a critical part of the process of ensuring that transfusion is as safe as possible. Effective screening for evidence of presence of the most common and dangerous TTIs can reduce the risk of transmission to a very low level (Dodd 2007). The adoption of screening strategies and establishing effective systems appropriate to the needs, infrastructure and resources of each country will ensure that all donated blood is correctly screened for TTIs (Pomper , 2003 and Maresch 2008). Voluntary blood donors are motivated donors who donate blood at regular intervals. In our study as well, all the samples screened were from voluntary blood donors. Therefore, retaining these repetitive non-renumerated blood donors as blood inventory with

effective screening protocols like pre and post donation counselling and using updated methods of screening will go a long way in releasing only non-reactive blood and blood components for clinical and manufacturing use. Furthermore, unnecessary expenditures from the superfluous testing and proper disposing of the infected blood products are also eliminated thereby lowering costs (Dhruva, 2014).

## ACKNOWLEDGEMENTS

The authors acknowledge the support provided by the staff of the central blood bank GMC/SMHS hospital. Indirect role played by blood donors whose samples have been included in the study is highly acknowledged.

## CONFLICT OF INTEREST

It is certified that there was not any conflict of interest.

## COMPETING INTERESTS

The authors declare that there were no competing interests.

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