



Seroprevalence of Transfusion Transmissible Infections Among Blood Donors at the Blood Bank of A Tertiary Care Teaching Hospital

KEYWORDS

Transfusion Transmitted Infections , Nucleic Acid Testing, HIV, HbsAg, HCV, VDRL, MP

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ABSTRACT **Introduction :** An unsafe blood transfusion is very costly from both human and economic points of view. There are several infectious as well as non-infectious risks associated with transfusion of blood. Seroprevalence of Transfusion Transmissible Infections (TTIs) among blood donors can be used to monitor the prevalence among apparently healthy adult population.

Materials and methods: To study the sero-prevalence of TTIs among the healthy blood donors during the period of January 2010 to May 2016. Total 23,288 units of blood were collected and were tested for HIV (I & II), HBsAg, HCV, VDRL and MP.

Result : From the total of 23,288 blood donors, 651 were seroreactive for at least one of the TTIs i.e HIV (I & II), HBsAg, HCV , VDRL and MP. The prevalence of HbsAg was 427(1.83%), VDRL was 112(0.48%), HIV was 54(0.23%), HCV was 52(0.22%) and MP was 06(0.02%).

Conclusion : The seroprevalence of HBsAg(1.83%) is higher compared to other TTIs i.e HIV, HCV, VDRL and MP.

INTRODUCTION: A well-organized Blood Transfusion Service (BTS) is an important component of the health care delivery system of any country. An integrated strategy for blood safety is required for elimination of Transfusion Transmissible Infections (TTI) and for provision of safe and adequate BTSs to the people. Blood transfusion has been used since 1930 for various indications[1].

Blood transfusion saves lives and improves health, but many patients requiring transfusion do not have timely access to safe blood. Providing safe and adequate blood should be an integral part of every country's national health care policy and infrastructure. Timely transfusion of blood saves millions of lives, but unsafe transfusion practices puts millions of people at risk of TTIs. The main component of an integrated strategy include collection of blood only from voluntary, non-remunerated blood donors, screening for all TTIs and reduction of unnecessary transfusion. According to the National AIDS Control Organization (NACO) guidelines all blood sample must be tested for Human Immunodeficiency Virus (HIV) 1 and 2, Hepatitis B, Hepatitis C, Syphilis and Malaria[2]. With every one unit of blood transfusion there is 01% chance of transfusion related complications including TTIs[3]. An unsafe blood transfusion is very costly from both human and economic points of view. Morbidity and mortality resulting from the transfusion of infected blood have far-reaching consequences, not only for the recipients themselves, but also for their families, their communities and the wider society. Since a person can transmit an infection during its asymptomatic phase, transfusions can contribute to an everwidening pool of infection in the population. Unsafe transfusion practices also put millions of people at risk of TTIs(6). India is already carrying a burden of 50 million of HBV carriers(7) and 2.27 million of HIV cases(8). Thus the present

study was conducted with an aim to assess the trend and sero-prevalence of TTIs among blood donors.

MATERIAL AND METHOD : Present study was carried out at Blood Bank of Mahatma Gandhi Medical College & Hospital, Jaipur.

A routine screening of every unit of blood to exclude HIV (I & II), HBsAg, HCV , Syphilis and MP was done over a period of 6 years and 5 months, from Jan 2010 to May 2016. In this duration, total of 23,288 units of blood were collected from donors (voluntary & replacement). Donors were selected by taking history, clinical examination and following strict donor's selection criteria to eliminate professional donors. A detailed pre-donation questionnaire was included in donor registration form. Information regarding risk factors like history of surgery, hospitalization, blood transfusion, occupation, high risk behavior and tattoo marks etc were collected. CBC was done by Three part analyzer, Horiba to rule out anaemia and thrombocytopenia and preexisting infections. All the samples were screened for HIV (I & II), HBsAg, HCV , Syphilis and MP. All the reactive samples were repeat tested before labeling them sero-positive and respective blood units were discarded.

Table 1 : Yearly distribution of voluntary and replacement donors.

| YEAR | TOTAL DONATIONS | TYPE OF DONORS |
|------|-----------------|----------------------|
| 2010 | 1292 | VD – 580 RD – 712 |
| 2011 | 1187 | VD – 474 RD – 713 |

| | | |
|-----------------|--------|----------------------------|
| 2012 | 2465 | VD – 1559 RD – 906 |
| 2013 | 3784 | VD – 1552 RD – 2232 |
| 2014 | 5404 | VD – 2444 RD – 2960 |
| 2015 | 6421 | VD – 2856 RD – 3565 |
| 2016 (Till May) | 2735 | VD – 1431 RD – 1304 |
| TOTAL | 23,288 | VD – 10,896 RD – 12,392 |

Table2 : Yearly distribution of seropositive blood donor.

| YEAR | TOTAL UNIT | HIV REAC-TIVE(%) | HBsAG REAC-TIVE(%) | HCV REAC-TIVE(%) | VDRL REAC-TIVE(%) | MP REAC-TIVE(%) | TOTAL REAC-TIVE(%) |
|--------|------------|------------------|--------------------|------------------|-------------------|-----------------|--------------------|
| 2010 | 1292 | 02 | 20 | 03 | 03 | 00 | 28 |
| 2011 | 1187 | 02 | 24 | 00 | 06 | 00 | 32 |
| 2012 | 2465 | 07 | 50 | 03 | 06 | 04 | 70 |
| 2013 | 3784 | 07 | 78 | 01 | 05 | 01 | 92 |
| 2014 | 5404 | 13 | 95 | 03 | 36 | 00 | 147 |
| 2015 | 6421 | 15 | 112 | 24 | 40 | 01 | 192 |
| 2016 | 2735 | 08 | 48 | 18 | 16 | 00 | 90 |
| TO-TAL | 23,288 | 54 (0.23%) | 427 (1.83%) | 52 (0.22%) | 112 (0.48%) | 06 (0.02%) | 651 (2.79%) |

Table3 : Sex and type of seropositive blood donors.

| YEAR | DISTRIBUTION | HIV | HB-sAG | HCV | VDRL | MP |
|------|--------------|-----|--------|-----|------|----|
| 2010 | Male | 02 | 20 | 03 | 03 | 00 |
| | Female | 00 | 00 | 00 | 00 | 00 |
| | Voluntary | 01 | 11 | 00 | 03 | 00 |
| | Replacement | 01 | 09 | 03 | 00 | 00 |
| 2011 | Male | 02 | 24 | 00 | 06 | 00 |
| | Female | 00 | 00 | 00 | 00 | 00 |
| | Voluntary | 00 | 13 | 00 | 03 | 00 |
| | Replacement | 02 | 11 | 00 | 03 | 00 |
| 2012 | Male | 07 | 50 | 03 | 06 | 04 |
| | Female | 00 | 00 | 00 | 00 | 00 |
| | Voluntary | 05 | 30 | 02 | 05 | 02 |
| | Replacement | 02 | 20 | 01 | 01 | 02 |
| 2013 | Male | 07 | 77 | 01 | 05 | 01 |
| | Female | 00 | 01 | 00 | 00 | 00 |
| | Voluntary | 04 | 40 | 00 | 02 | 01 |
| | Replacement | 03 | 38 | 01 | 03 | 00 |
| 2014 | Male | 13 | 94 | 03 | 36 | 00 |
| | Female | 00 | 01 | 00 | 00 | 00 |
| | Voluntary | 05 | 39 | 01 | 19 | 00 |
| | Replacement | 08 | 56 | 02 | 17 | 00 |

| | | | | | | |
|----------------|-------------|----|-----|----|----|----|
| 2015 | Male | 13 | 112 | 23 | 40 | 00 |
| | Female | 00 | 00 | 01 | 00 | 01 |
| | Voluntary | 05 | 54 | 15 | 22 | 00 |
| | Replacement | 08 | 58 | 09 | 18 | 01 |
| 2016(Till May) | Male | 08 | 47 | 18 | 15 | 00 |
| | Female | 00 | 01 | 00 | 01 | 00 |
| | Voluntary | 06 | 30 | 09 | 14 | 00 |
| | Replacement | 02 | 18 | 09 | 02 | 00 |

RESULT:

Total Seroprevalence of HBsAg were determined to be 1.83%, VDRL was 0.48%, HIV (I & II) was 0.23%, HCV was 0.22% and MP was 0.02%. Though the prevalence of infection was higher among the male blood donors. HbsAg prevalence was highest. In the present study the overall incidence of TT1 was 2.79%. The frequency of HbsAg is more than other infectious diseases because Of asymptomatic carriers.

DISCUSSION:

India reports the greatest increase in the number of voluntary unpaid blood donations from 3.6 million in 2007 to 4.6 million in 2008(4). The magnitude of the TTIs varies from country to country depending on loads in that particular population. It is important to note that the problem of TTIs is directly proportional to the prevalence of infections in the blood donor community. Voluntary donors (VD) are motivated blood donors who donate blood at regular intervals and replacement donors (RD) are usually one time blood donors who donate blood only when a relative or a friend is in need of blood. The increase in voluntary donors may be attributed to the increasing public awareness and involvement of government bodies like NACO (National AIDS Control Organisation) who actively propagate voluntary donation in our country. Though it should never be forgotten that blood donations collected in the latent period of infections may also be infectious despite a negative antibody test. Thus incorporating Nucleic Acid Testing to routine blood screening protocol (to detect low viral RNA or DNA levels), educating people, creating awareness, encouraging voluntary blood donation camps and implementing strict donor selection criteria as per NACO guidelines to blood bank is the most effective way of ensuring adequate supplies of safe blood on a continuing basis. Also there is a need to report the results of the tests after donation with follow up counseling to prevent further transmission of the infection. Effective control strategies including a sensitive and proper screening of all blood donors, public awareness progress and institution of adequate public health measures are urgently needed(5). The seropositivity could be further decreased by introduction of Nucleic Acid Amplification Testing (NAT) for HIV and HCV.

CONCLUSION: Our study reports on the prevalence of TTIs in voluntary blood donors in last 6 years and 5 months in the pretransfusion blood. According to this study HBsAg and VDRL infections have increased but HIV (I & II) infections are present in almost the same with a marginal rise. This warrants vigorous efforts in the field of public awareness and emphasis on better and latest generation diagnostic tools to achieve the declining trends in seroprevalence of various TTIs in blood donors of society.

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