



## STUDY OF HIV, HBV AND HCV INFECTION SEROPOSITIVITY AMONG VOLUNTARY BLOOD DONORS IN RURAL TERTIARY CARE HOSPITAL BLOOD BANK IN WESTERN MAHARASHTRA

### Medical Science

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### ABSTRACT

**Background:** Blood transfusion carries the risk of transmitting the life threatening transfusion transmissible infectious (TTI) like HIV, hepatitis B and hepatitis C

**Objectives:** To estimate Frequency of HIV, hepatitis B and hepatitis C infections in voluntary blood donors

**Material & Methods:** A retrospective analysis of 35968 voluntary blood donors' records over period of 6 years from January 2009 to December 2014.

**Results:** The overall seropositivity of HBV, HIV and HCV were 2.2%, 0.7% and 0.6% respectively;

**Conclusions:** Estimation among voluntary blood donors can reveal the problem of infections in healthy-looking members of the population and is important in formulating the strategies for improving the management of a safe blood supply.

### KEYWORDS

Transfusion Transmitted Infections (TTI), HIV, hepatitis B, hepatitis C

### INTRODUCTION:

The Indian subcontinent is classified as an intermediate Hepatitis B Virus (HBV) endemic (HBsAg carriage 2-7%) zone and has the second largest global pool of chronic HBV infections.<sup>1</sup> India has a population of more than 1.2 billion with 5.7 (reduced to 2.5) million Human Immunodeficiency Virus (HIV) positive, 43 million HBV positive and 15 million HCV positive persons. The risk of transfusion transmission of these viruses may be alarming due to high seroprevalence of HIV, HCV, and HBV (0.5%, 0.4%, and 1.4%, respectively) among blood donors.<sup>2</sup> Safety assessment of the blood supply, the quality of screening procedures and the risk of transfusion transmitted infectious diseases (TTIs) in any country can be estimated by review and analysis of the records of blood donors for screening procedures and the prevalence of serological markers of infectious diseases.<sup>3</sup>

Transfusion therapy is a well-established treatment in various medical and surgical procedures.<sup>4</sup> Transfusion medicine, apart from being important for the medical treatment of each patient, also has a great public health importance worldwide.<sup>5</sup> After the introduction of the blood banks and better storage techniques, it became more widely used.<sup>6</sup> Blood is one of the major sources of transmission of hepatitis B, hepatitis C, HIV, syphilis, and many other diseases.<sup>5,7</sup> Discovery of these hazards brought a dramatic change in attitude of physicians and patients about transfusion of blood.<sup>8</sup> It is mandatory to test each donor's blood for hepatitis B, hepatitis C, HIV. In July 1989, consequent to the reports of high seroprevalence in commercial blood donors, mandatory screening of blood and blood products for HIV antibodies was initiated by Indian National AIDS Control Origination (NACO).<sup>9</sup> The objective of this study is to estimate the frequency of transfusion transmitted infections (TTI) among voluntary blood donors at a rural tertiary healthcare hospital in western Maharashtra.

### MATERIAL & METHODS:

The present retrospective study was undertaken in RCSM Government medical college and CPR Hospital blood bank, Kolhapur, over duration of 6 years from January 2009 to December 2014. Data of 35,968 voluntary blood donors' screening test for HIV, hepatitis B, hepatitis C done by ELISA (enzyme-linked immunosorbent assay) method, their history of any previous illnesses, past history of blood transfusion and history of any risky sexual practice was collected from questionnaire in blood bank records. The data was analyzed for calculating frequency of seropositivity of HIV, hepatitis B and hepatitis C infections among them.

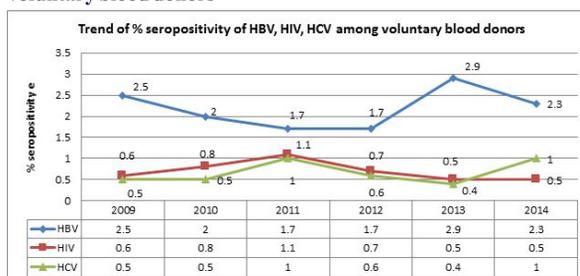
### RESULTS:

From the total of 35,968 voluntary blood donors, overall seropositive cases of HIV, HBV, HCV were 1275 (3.5%). The overall seropositivity was maximum for HBV (2.2%) followed by, HIV (0.7%) and HCV (0.6%) (Table-1).

**Table-1- Year wise frequency distribution of HBV, HCV and HIV sero-positivity**

Years	Year wise Total no of voluntary blood donors	Year wise total no of seropositive donors	HBV positive cases		HIV positive Cases		HCV positive Cases	
			cases	% out of Total no of voluntary blood donors	cases	% out of Total no of voluntary blood donors	cases	% out of Total no of voluntary blood donors
2009	7423	266 (3.6%)	186	2.5	45	0.6	35	0.5
2010	7974	266 (3.3%)	160	2.0	67	0.8	39	0.5
2011	5348	201 (3.8%)	91	1.7	59	1.1	51	1.0
2012	5283	161 (3.0%)	92	1.7	35	0.7	34	0.6
2013	5133	198 (3.9%)	150	2.9	28	0.5	20	0.4
2014	4807	183 (3.8%)	111	2.3	26	0.5	46	1.0
<b>TOTAL</b>	<b>35968</b>	<b>1275 (3.5%)</b>	<b>790</b>	<b>2.2</b>	<b>260</b>	<b>0.7</b>	<b>225</b>	<b>0.6</b>

**Graph-1- Trend of % seropositivity of HBV, HIV, HCV among voluntary blood donors**



The frequency of seropositivity of HIV was maximum i.e. 1.1% in 2011 after which it showed a declining trend, that is 0.5% in 2013 and 2014. The declining trends are a good signal as the risk of acquiring infections due to transfusion is decreased. The frequency of seropositivity of HBV appeared to decrease from 2009 to 2012 but after that it increased from 2012. Maximum frequency of HBV recorded was 2.9% in 2013. HCV positivity is showing two peaks, one at 2011 and other at 2014 (1% each) (Graph-1)

### DISCUSSION:

Blood transfusion is a potential route of transmission of life threatening transfusion transmissible infectious e.g. HIV, hepatitis B, and hepatitis C which are major public health problems in developing countries.<sup>10,11</sup> Screening of blood is now mandatory and is undertaken routinely in blood banks. Transmission of these infections poses a threat to blood safety in environments where there is a high rate of these infections. HBV and HCV are the two established causes of post-transfusion hepatitis. The prevalence of TTIs among the Indian blood

donors is reported to be ranging as follows; HBV – 0.66% to 12%, HCV – 0.5% to 1.5%, HIV–0.084% to 3.87%, respectively.<sup>12</sup> The present study revealed seropositivity of HBV as 2.2 % among the voluntary donors which is similar to findings by Chaudhari *et al*<sup>13</sup> and Sawke *et al*<sup>14</sup> who reported it as 2.45% and 2.9% respectively. Variable results of 0.66%<sup>15</sup>, 3.44%<sup>16</sup>, 5.86%<sup>17</sup>, 25%<sup>18</sup> have also been reported in various other studies. The frequency of HCV positivity in this study was 0.6%, which is similar to monika *et al*<sup>19</sup> who reported it as 0.57%, while others reported variable frequencies such as 0.79%<sup>12</sup>, 0.88%<sup>20</sup> and 0.78%<sup>21</sup>; whereas a few studies reported much higher frequencies such as 1.09%<sup>15</sup>, 1.57%<sup>22</sup>, 2.8%<sup>23</sup> and 6.21%<sup>17</sup> and others reported lower frequency like 0.50%<sup>24</sup> and 0.28%<sup>16</sup>. The reason for more HBV and HCV positivity might be related to the availability of better new advanced diagnostic kits with improvements in specificity & sensitivity of blood-borne pathogen detection or else could represent a real increase in prevalence of the diseases among asymptomatic cases in the society and may need attention from health authorities. In the present study, the average frequency of HIV was found to be 0.7% . Few studies reported lower frequencies such as 0.13%,<sup>12</sup> 0.26%,<sup>21</sup> 0.47%<sup>16</sup> while some reported higher frequency like 3.8%<sup>25</sup> and 11.7%<sup>18</sup> . The declining trend of HIV in the study was may be due to public awareness about the disease through education and media.

### CONCLUSION:

The present study found that these diseases are also prevalent among apparently healthy donors. Hence, applying strict selection criteria for selection of blood donors and screening of them for TTIs using standard and more advanced methods kits with improved specificity & sensitivity are highly recommended to ensure the safety of blood for recipient.

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