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SEROPOSITIVITY OF HEPATITIS C VIRUS INFECTION AMONG BLOOD DONORS AT A TERTIARY CARE CENTER IN WESTERN RAJASTHAN

Transfusion Medicine

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ABSTRACT

Background & Objectives: The HCV epidemic is one of the largest public health crises of the 21st century, which has evolved from a mysterious illness to a global pandemic in less than 20 years. The purpose of this study is to estimate the seropositivity of HCV infection among blood donors at our blood centre in Western Rajasthan. **Methods:** A Retrospective study of all donations from January 2022 to November 2022 was conducted for the seropositivity of HCV among the blood donors. A total of 41167 donations were analyzed for seropositivity, data were collected in Excel data sheet and analyzed using statistical calculations by IBM SPSS statistical software platform version 26. Seropositivity rate was calculated, chi square test was applied to test the significance. **Results:** Out of the total 41167 donors tested for HCV infection, 91(0.22%) were found to be HCV seropositive. **Conclusion:** Strict blood donor screening, encouraging people to donate blood freely at regular intervals and widespread Hepatitis C immunization are always to reduce the occurrence of transfusion-transmitted infections. Although it will be challenging, we can still achieve our goal of having all blood donations in India.

KEYWORDS

HCV, Seropositivity, Voluntary Non-Remunerated Donors (VNRD), Replacement Donors (RD).

INTRODUCTION

Blood transfusion contributes immensely to health service delivery, particularly during supportive care for medical and surgical patients. The practice saves lives and improves health. The diseases transmitted through blood transfusion are - HIV, HBV, HCV, syphilis, malaria, and infrequently cytomegalovirus, Epstein Barr virus, brucellosis, etc. Preventing transmission of these infectious diseases through blood transfusion presents one of the greatest challenges of transfusion medicine. As per guidelines of the ministry of health and family welfare (Government of India) under The Drug and Cosmetic Act, 1945 (amended from time to time), all the blood donations are to be screened against the five major infections namely Human Immunodeficiency Virus (HIV I & II), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Syphilis, and Malaria.[1,2]

Global seropositivity of HCV in blood donors is 0.4–19.2%.[3]Because of problems such as unsafe medical practices, low quality in blood screening tests, and intravenous drug abuse with shared needle, HCV is more prevalent in developing countries. For example, higher HCV seropositivity rate has been reported in Southeast Asian countries, including India (1.5%), Malaysia (2.3%), Philippines (2.3%), Pakistan (8.1%), and in equatorial Africa (6.5%), and as high as(20%) in Egypt.[4,5] The disease is a common cause of non-A non-B viral hepatitis. About85% of persons infected with HCV develop into the chronic stage while approximately 15% of the infected patients clear the infection.[6]

MATERIAL AND METHOD

This is a Retrospective study that was carried out at Blood Centre, Department of Immuno-Haematology and Transfusion Medicine, S.P Medical College, Bikaner, Rajasthan. Donors were examined and screened by a Transfusion medicine specialist after satisfactory completion of the donor's questionnaire, their physical examination, and hemoglobin (Hb%) estimation.

A total of 41167 blood units from the selected donors were collected over a period of Jan to Nov. 2022. These donors were Voluntary Non-Remunerated Donors (VNRD) and Replacement Donors (RD). Replacement donors were those donors who donated blood for ailing patients and were family members, close relatives and friends of the recipient. The Voluntary donations were obtained from walk in donors and in voluntary blood donation camps organized by different institutions, neighboring colleges, different social and political organizations.

Written consent from the donor was also taken prior to blood donation. Three ml blood in plain vial and 2 ml blood in ethylene diamine tetra acetic acid (EDTA) vial taken from the satellite bag for serology screening. The samples were screened for HCV using Merilisa HCV ELISA kits (Meril Diagnostics Ltd.) or Oscar HCV ELISA kits (Oscar Diagnostics Ltd.). The test is based on solid phase microplate direct ELISA (Sandwich ELISA) technique. Samples found positive for HCV were again retested and if found positive then discarded.

Statistical Analysis

Data was collected in Excel data sheet and analyzed using statistical calculations by IBM SPSS statistical software platform version 26. Seropositivity rate was calculated, chi square test was applied to test the significance. A p-value of <0.05 was considered significant.

RESULTS

A total of 41167 blood was donated between January 2022 to November 2022 out of which 40806 (99.124%) were male donors and 361(0.876%) were female donors.

Replacement donors were 10291 and Voluntary donors were 30876 and most of the donors belonged to the 26-40 age group which demonstrates active participation in voluntary blood donation among the region. This study also demonstrates the frequency of ABO and Rh blood groups in the region. The maximum number of blood donors were B followed by O then A and the least no. of the donor were AB (Table 2).

The seropositivity for HCV among the voluntary blood donors was 0.25% while it was 0.10% among the replacement donors (Table 3) which was statistically significant (P value is 0.004408 which is significant as $p<0.05$). The overall seropositivity of HCV was 0.22%.

Age-group wise distribution of seropositive donations and age-specific seropositivity is shown in the (Table 1). Maximum seropositive donations were from the 26-40 age group and least from the extreme age group 51-60 years.

Table 1. Age-group Wise Distribution Of Blood Donors

Age Group (in years)	Voluntary Donors	Replacement Donors
18-25	10709	3323
26-40	14592	4961
41-50	3345	1454
51-60	2230	553
Total	30876	10291

Table 2. ABO and Rh Frequency Among Blood Donors

ABO group	Rh Positive	Rh-Negative
A	8074	788
B	13876	1351
AB	3349	298
O	12165	1266
Total	37464	3703

Table 3. HCV Seropositivity Among Voluntary And Replacement Donors

HCV	Voluntary	Replacement	Total
Positive (%)	80(0.25)	11(0.10)	91(0.22)
Negative	30796	10280	41076
Total	30876	10291	41167

Table 4. Age-specific HCV Positive Donor And Seropositivity Rate

Age Group	HCV Positive	Seropositivity (%)
18-25	38/14032	0.270
26-40	50/19553	0.255
41-50	2/4799	0.041
51-60	1/2783	0.035
Total	91/41167	0.221

DISCUSSION

The present study aimed to know the seropositivity and yearly trend of hepatitis C virus (HCV) infection among blood donors of Western Rajasthan. Blood donation records for over one years were reviewed retrospectively for seropositivity and yearly trend of HCV infection. In present study seropositivity of HCV infection was 0.22% (91/41167) which was lower than study done by Panda et al.[7] (1.98%), Gupta et al.[8] (1.09%), Pahuja et al.[9] (0.66%), Kumar et al.[10] (1.53%). Among high income countries, the prevalence of HCV in blood donors ranges from 0.002% to 0.05%, in middle level countries, it ranges from 0.03% to 0.80%, and in low income countries, it ranges from 0.50% to 2.23%.[11]

Seropositivity of HCV infection varies from region to region because of local socio cultural factors, which potentially influence the transmission and seropositivity in a specific geographic area. The seropositivity of HCV in voluntary blood donors in India was found between 0.12% and 4%.[12]In the present study, overall seropositivity during the 1 year was 0.22%.

In the present study, HCV infection rate of individuals aged 18-25 was 0.27% while the infection rate of individuals aged 51-60 was 0.03% and this difference was statically significant.

CONCLUSION

The seropositivity of HCV was 0.22% among blood donors of Rajasthan. We concluded that increasing trend of voluntary donation with a male predominance. Strict blood donor screening, encouraging people to donate blood freely at regular intervals and widespread hepatitis C immunization are always to reduce the occurrence of transfusion-transmitted infections. It can also be seen from the above data that there's a marked fall in the seropositivity of HCV infection in the past decade which could be due to the various awareness, educational programs and campaigns run by The Government of India.

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