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Trends of Transfusion transmitted Viral Infections in Whole Blood Donors of tertiary care hospital in North India.

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INTRODUCTION:

Timely transfusion of blood/ blood components saves millions of lives. However, the same puts millions of people at risk of transfusion transmissible infections (TTIs), if unsafe transfusion practices are practiced, [1]. The magnitude of the TTI varies from country to country depending on TTIs' load in that particular population from where blood units are sourced. Since an infection can be transmitted during its asymptomatic phase, transfusions can contribute to an ever widening pool of infection in the population. The economic costs of the failure to control the transmission of infection include increased requirement for medical care, higher levels of dependency and the loss of productive labor force, placing heavy burdens on already overstretched health and social services and on the national economy [2]. A well- organized blood transfusion service (BTS) is an important component of the health care 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 BTS's to the people. Several measures are taken to minimize TTI transmission. The past several decades have witnessed great advantage in techniques of detecting these TTIs. With the advent of nucleic acid amplification technique (NAT), western countries have reduced the risk of TTIs to a major extent. The main element of an integrated strategy of BTS includes collection of blood only from voluntary, non-remunerated blood donors, screening for all TTIs and reduction of unnecessary transfusion[1]. According to the National AIDS Control Organization (NACO) guidelines all blood samples must be tested for human immune deficiency virus (HIV) 1 and 2, hepatitis B, hepatitis C, syphilis and malaria [2].

AIM AND OBJECTIVES

To study the sero prevalence and trends in Transfusion Transmitted viral infections including HIV, HBV, HCV in whole blood donors

MATERIALS AND METHODS:

A Retrospective study of 2 years (2021 and 2022) is conducted to study the trends in sero-prevalence of TTI's in both outdoor and inhouse blood collection at Blood centre, Government Medical College and Rajindra hospital Patiala..

Outdoor collection is collection of blood units from voluntary donor who donate blood in outdoor camps. Inhouse collection is collection of blood units from voluntary donors who donated blood in blood centre. Blood samples of these collected blood units were tested for HIV I and II, HBV, HCV as per the NACO guidelines. HIV test, HBV screening, and HCV were done using ELISA test. In emergency, Rapid test were done as approved by NACO. The results were documented and assessed.

RESULTS:

Out of 16793 blood units collected in 2021, 7568 (45%) units were from inhouse collection whereas 9225 (55%) units were from outdoor collection. Overall 207 (1.23%) donors were found to be HCV positive, out of which 125 (0.75%) were HCV positive from indoor collection and 82 (0.48%) were HCV positive from outdoor collection. Overall 65 (0.38%) donors were positive for HBV, out of which 44 (0.26%) were HBV positive from indoor collection and 21 (0.12%) were HBV positive from outdoor collection. 20 (0.12%) donors were positive for HIV, for either I or II, out of which 8 (0.05%) were HIV positive from indoor collection and 12 (0.07%) were HIV positive from outdoor collection.In 2022, Out of 22590 blood units , overall 227 (1%) units were

found to be HCV positive, from which 147 (0.65%) units were from inhouse donors and 80 (0.35%) were from outdoor collection.109 (0.48%) donors were positive for HBV, out of which 55 (0.24%) were from inhouse collection and 54 (0.24%) were from outdoor collection . 28 (0.12%) donors were positive for HIV, for either I or II, out of which 18 (0.08%) were from inhouse collection and 10 (0.04%) were from outdoor collection. There was a decline in number of donors screened as positive for HCV, HBV, and HIV, indicating effective donor counselling and

Table -1 : Number and percentage of blood units in inhouse and outdoor collection.

Year	Inhouse collection No.(%)	Outdoor collection No.(%)	Total
2021	7568 (45)	9225 (55)	16793
2022	9514 (42)	13076 (58)	22590

Table- 2: Seroprevalance of Viral markers in Inhouse and Outdoor donors.

	HCV No.(%)			HBs Ag No.(%)			HIV No.(%)		
Year	Inhouse	Outdoor	Total	Inhouse	Outdoor	Total	Inhouse	Outdoor	Total
2021	125 (0.75)	82 (0.48)	207 (1.23)	44 (0.26)	21 (0.12)	65 (0.38)	8 (0.05)	12 (0.07)	20 (0.12)
2022	147 (0.65)	80 (0.35)	227 (1)	55 (0.24)	54 (0.24)	109 (0.48)	18 (0.08)	10 (0.04)	28 (0.12)

The prevalence of TTIs was significantly higher for male donors than for female donors. Donors with age group 21–30 showed a high prevalence of HCV in 2021 and 2022 which was 126 (0.75%) in 2021 and decreased to 135 (0.6%) in 2022.

Donors with age group 21–30 showed a high prevalence of HBsAg in 2021 and 2022 which was 22 (0.13%) in 2021 and 60 (0.27%) in 2022 .

Donors with age group 31–40 showed a high prevalence of HIV which was 10 (0.06%) in 2021 whereas in 2022 donor with age group 21-30 showed a high prevalence of HIV which was 18 (0.079%). .

DISCUSSION:

With every unit of blood, there is 1% chance of transfusion associated problems including TTI [3]. The risk of TTI has declined dramatically in high income nations over the past two decades, primarily because of extraordinary success in preventing HIV and other established transfusion transmitted viruses from entering the blood supply [4]. But the same may not hold true for the developing countries.

The prevalence rate of HCV infection in blood donors was revealed to be 1.23% in 2021 and 1% in 2022, which is lower than the studies done in Ghana, Cameroon, Sudan, Pakistan, Gabonese, and Tanzania whose prevalence rate were 5.63%, 4.8%, 3.1%, 8.34%, 2.78%, and 1.5% respectively[5,6,7,8,9,10]. However, it is higher compared to 0.7%, 0.64%, 0.31% in Ethiopia, Nepal, China [11,12,13,].

The seroprevalence of HBV 0.38% in 2021 and 0.48% in 2022, this study is in agreement with a previous finding i.e. 0.46% from Nepal, but lower than 0.87% and 0.6% from China and Namibia [12,13,14].

The prevalence of HIV in this study is 0.12% in both 2021 and 2022 which is concordant with studies done by Nepal (0.12%), but lower than (0.86%), (0.3%) and (0.96%) by China, Namibia and Nigeria respectively [12,13,14,15].

The overall prevalence of TTIs in the study area shows a decreasing trend, from 1.73% in 2021 to 1.6% in 2022. This trend is similar with the findings of studies conducted in Northwest Ethiopia [11]. The declining trends of the seroprevalence of TTIs may be due to the changes/improvements made by the blood centre for proper selection of donors by eliminating donors having history of multiple partners, history of jaundice, drug abusers, patients with tattoos and other positive history.. Hence, stringent donor selection, strict pre-screening using standard methods, subsequent follow-up for TTIs after blood transfusion and preventive measures to control infections in the general population are highly recommended to ensure the safety of blood for recipient.

The prevalence of TTIs was significantly higher among male donors compared to female donors . This might be due to some risk behaviors such as outside socialization, multiple sex relationships which is frequently observed in Males. It may also be due to fewer females donating blood; hence, fewer females are screened compared to males.

Seroprevalence rates of TTIs in relation to age range distribution showed that the prevalence of TTIs decreased with age. Donors with age group 21-30 showed a high prevalence of TTIs.This is in concodant to the fact that the life period of 21-30 years is also a period of intense sexual activity favorable to the infection transmission. This also indicates that the youth are the main blood donors. This might be explained by the fact they are also the major age groups that fulfill the selection criteria for blood donation compared to the other age groups (older age) [16].

CONCLUSION:

Stringent donor selection, strict pre-screening using standard methods, subsequent follow-up for TTIs after blood transfusion and preventive measures to control infections in the general population are highly recommended to ensure the safety of blood for recipient. Non-remunerated and repeat voluntary blood donor services are very much needed and should be encouraged. Reduction in unnecessary blood transfusion, we can ensure safe blood supply to all the recipients. With the implementation of strict donor selection criteria, use of sensitive screening tests, and establishment of strict guidelines for blood transfusion, it is possible to reduce the incidence of TTI's in the Indian scenario.

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