

## Seroprevalence of Transfusion-Transmissible Infectious Diseases at a Tertiary Care Hospital (Blood Bank) in Udaipur: A Three Year Retrospective Study

Megha Pandey<sup>1</sup>, Ashish Pandey<sup>2</sup>, S.N. Chawla<sup>3</sup>, Jitendra Panchal<sup>4</sup>

### Abstract

**Background:** Blood is life. Blood transfusion service (BTS) is an integral and indispensable part of the healthcare system. The priority objective of BTS is to ensure safety, adequacy, accessibility and efficiency of blood supply at all levels. In spite of this large number of well-known complications are associated with blood transfusion like transfusion-transmissible infections, such as HIV, hepatitis B, hepatitis C and VDRL.

**Aims & Objective:** To study seroprevalence of HIV, HBV, HCV and syphilis in blood donors at tertiary care hospital.

**Material & Methods:** This was a retrospective study, where the data was procured from blood bank of the tertiary care hospital, Udaipur. All the blood donors in the records over a period of three years were included in the analysis. A through search of records revealed that total 3893 donors had been screened over period of 3 years. All the samples were screened for prevalence of HIV, HBsAg, HCV and syphilis. All the seropositive donors were further divided into voluntary and replacement donor categories.

**Result:** Of the total 3893 donors, 1405 were voluntary and 2488 were replacement donors. The seropositive rates amongst voluntary and replacement donors were 2.6% and 2.4% respectively. The overall prevalence of seropositivity for HIV, HBsAg, HCV and VDRL were 0.12%, 0.84%, 0.07% and 1.4% respectively.

**Conclusion:** On comparing the data of three years an increasing trend in seroprevalence of HBsAg, anti-HCV, VDRL and decreasing trend for HIV was observed.

**Keywords:** Transfusion-Transmissible Infectious Diseases; HIV; HBsAg; VDRL & HCV.

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### Introduction

Blood safety begins with a healthy donor. Blood is one of the most complex fluids and equally valuable for the existence, but this blood is also

a very efficient means of transmitting infections [1]. The complications associated with blood transfusion vary from only trivial to potentially life threatening, demanding for meticulous pretransfusion testing and screening particularly for transfusion transmissible infections (TTI) [2]. The magnitude of the TTI varies from country to country depending on the load of TTI in that particular population from where blood units are sourced [3]. India has approximately 2.5 million human immunodeficiency virus (HIV) positive, 43 million HBV positive and 15 million HCV positive persons. The risk of transfusion related transmission of these viruses may be alarming due to high sero-prevalence of HIV (0.5%), anti-HCV (0.4%), and HBsAg (1.4%) among blood donors [4]. WHO recommends that all blood donations should be screened for infections prior to use. Screening

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**Authors Affiliation:** <sup>1</sup>Associate Professor <sup>2</sup>Assistant Professor <sup>3</sup>Professor, <sup>4</sup>Bsc MLT, Blood Bank Technical Supervisor, Department of Pathology, American International Institute of Medical Sciences, Near Transport Nagar, Airport Road, Bedwas, Udaipur, Rajasthan 313001, India.

**Corresponding Author:** Ashish Pandey, Department of Pathology, American International Institute of Medical Sciences, Near Transport Nagar, Airport Road, Bedwas, Udaipur, Rajasthan 313001, India.

**E-mail:** [ashishpandey\\_789@yahoo.com](mailto:ashishpandey_789@yahoo.com)

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should be mandatory for HIV, hepatitis B, hepatitis C and syphilis [1].

Thus The priority objective of blood transfusion services is to ensure safety, adequacy, accessibility and efficiency of blood supply at all levels [5]. It not only screens TTIs but also gives a clue about the prevalence of these infections in healthy populations [6].

### Aims & Objectives

To screen all the blood donors for selective diseases HIV, HBV, HCV and VDRL, transmissible by bloodtransfusion during the 3 years period from 2016-2018. To compare and evaluate seroprevalence of selected blood transmissible diseases in voluntary and replacement blood donors. To estimate and compare the blood donors by type of donor and gender.

### Methods

Retrospective study was conducted over a period of 3 years at hospital blood bank of American International Institute of Medical Sciences, Udaipur. The study was conducted on both voluntary and replacement blood donors who came to our blood bank and during voluntary blood donation camps. All the blood donors, donating blood in the blood bank were considered as the study population. The

family members, friends or relatives of the patients were categorized as replacement donors. People who donate blood without expecting any favor in return or in voluntary blood donation camps were classified as voluntary blood donors. Donors were screened by the standard criteria for donor fitness. They were carefully selected for donation by trained personnel after medical examination and a detailed pre donation questionnaire form, which included the donor register form, information regarding risk factor such as history of surgery, previous illness, hospitalization, and blood transfusion. The donors were included in the study after obtaining informed consent.

### Results

Of the total 3893 donors, 1405 were voluntary and 2488 were replacement donors. On comparing the data of three years, the number of blood donors are increasing ever year (Table 1). In this three yeas study seropositive rate for males markedly outnumbered females (Table 4). Overall seropositive rates amongst voluntary and replacement donors were 2.6% (Table 2) and 2.4% (Table 3) respectively. The seropositive rate were almost same for 2 years i.e. 2016 and 2018. The overall prevalence of seropositivity for HIV, HBsAg, HCV and VDRL were 0.12%, 0.84%, 0.07% and 1.4 % respectively (Table 5)

**Table 1:** Annual distribution of blood donor types & seropositive reactions. (3 years)

Year	No. of donors	Voluntary	Replacement	HIV	HBV	HCV	VDRL	Total % Seropositive
2016	914	393	521	02	07	01	17	2.9
2017	1298	506	792	03	08	00	14	1.9
2018	1681	506	1175	00	18	02	25	2.6

**Table 2:** Seropositive rates among voluntary donors (3 years)

Voluntary no.	HIV	HBV	HCV	VDRL	Total % seropositive
1405	01	12	02	22	2.6

**Table 3:** Seropositive rates among replacement donors (3 years )

Replacement no.	HIV	HBV	HCV	VDRL	Total % seropositive
2488	04	21	01	34	2.4

**Table 4:** Seropositive rates: Male versus female blood donors.

Total number of donation	Male	Female
3893	96	01

**Table 5:** Overall prevalence of seropositive cases for 3 years.

Serology test	Percentage
HIV	0.12
HBsAg	0.84
HCV	0.07
VDRL	1.4

## Discussion

According to WHO, safe blood is a universal right. To improve blood transfusion safety, it recommends an integrated strategy including establishment of well-organized blood transfusion services, prioritization of blood donation from voluntary non-remunerated donors, screening of donated blood for at least the four major TTIs such as HIV, Hepatitis B, Hepatitis C and Syphilis with quality-assured assays, rational use of blood and implementation of effective quality control systems (WHO, 2010) [7]. With every unit of blood, there is 1% chance of transfusion associated problems including TTI [8]. The risk of TTI has declined dramatically in developed countries, but the same may not hold good for the developing countries, as the transfusion services are hospital based and fragmented [2].

Voluntary donors are motivated blood donors who donate blood at regular intervals and replacement donors are usually one time blood donors who donate blood only when a relative is in need of blood [9]. Majority of donors in present study were replacement donors (2488) as compared to voluntary donors (1405), similar to findings of T. Chaliha et al. [10]. Present study observed a slightly higher rate of seropositivity amongst voluntary donors than replacement donors, which in contrast to findings of Khaneta P et al. [1]. The concealment of medical history and lifestyle are the important causes of seropositivity among both the categories of donors [11].

The majority of donors in our study were males with higher prevalence of seropositivity than female, which is in concordance with observations of P. Pallavi et al. [2]

Study by Khaneta P et al. [1] found a decline in the HIV, HBV & VDRL seropositivity rates which is in contrast with our study where a rising seropositivity trend was observed for VDRL (maximum), HBV, HCV and a decline in cases of HIV1.

In this study, the overall prevalence of HIV seropositivity (0.12%) was lower than that of other studies done by Bharat S et al. [12] and Pallavi P et

al. [2] in which it was 0.8% and 0.44 % respectively. Our study observed a decrease in the prevalence of HIV seropositivity over the period of three years, which is in concordance with Makroo RN et al. [13].

The prevalence of HBs Ag seropositivity (0.84%) was lower than that seen in study by Bharat S et al. [12], where it was 1.8%. An upward rise in the prevalence of HBsAg positivity was observed during the three years of the study period, which is similar to observations done by Bhattacharya P et al. [14].

Anti HCV positivity (0.07%) was lower than that reported by other studies i.e Pallavi P et al. [2] (0.23%), Jain et al. [15]. (1.57%) and Das DK GB et al. [16].

In this study VDRL positivity was 1.4% which was more than study done by Gupta et al. [17], in which it was 0.27%. The positivity for VDRL showed significant upward trend in the present study which is similar to observation of Pallavi P et al. [2].

## Conclusion

Blood transfusion is an integral and lifesaving procedure. In present study we came across that majority of the donors were in the category of replacement donors. Therefore a more aggressive workup is needed to bring awareness among the general population of this region regarding importance of voluntary blood donation. Moreover seropositivity was noted more amongst voluntary donors indicating that there are still many hidden cases in our society which should be addressed immediately through increasing the number of voluntary blood camps, especially in the peripheral areas on this region, where the study had been undertaken. A decline was observed in HIV cases but an increase in cases of HBV, HCV and a marked rise in the number of VDRL cases. This warrants for increase efforts by the concerned.

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