



ORIGINAL ARTICLE

A Retrospective Study of IV Transmitted Diseases through Blood Products among Blood Donors at AIMTH

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Abstract

Objectives: To assess the Frequency of IV transmitted Diseases through blood products among blood donors at AIMTH, Sialkot.

Methodology: An observational retrospective study was conducted in August 2023. The data was collected from June 2022 to July 2023 from the Blood Bank of Allama Iqbal Memorial Teaching hospital Sialkot. The data was collected and analysed for the frequency of diseases (hepatitis B, hepatitis C, VDRL/syphilis, HIV and malaria) transmitted through transfusion among 3287 Blood Donors" Allama Iqbal Memorial Teaching hospital Sialkot.

Results: Amongst 3287 blood donations, 1.61 % (n = 53) were infected at least with one pathogen, HCV positive cases were 0.73% (n = 24), syphilis positive were 0.49% (n = 14) HBV positive cases were 0.36% (n = 12), HIV positive cases were only 0.03% (n=1) and malaria 00 (0%) in decreasing order. Out of 3287, 95% (n= 3123) were males and 5% (n=164) were females.

Conclusion: Our research concludes that there is little chance of transmission by transfusion. Just 53 out of the 3287 blood donors in this study had a TTI diagnosis.

Keywords: HBV; HCV; HIV; TTIs; infections; syphilis; malaria; transfusion transmitted diseases.

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Introduction

A blood transfusion is a common medical procedure where inpatients (indoor) receive supplied blood. This potentially life-saving operation can assist in replenishing blood lost as a result of trauma or surgery.

A blood transfusion may also be beneficial if a medical condition inhibits your body's ability to properly produce blood or certain blood components.¹ Blood is typically donated. Blood banks and healthcare practitioners ensure that transfusions are a safe; low-risk procedure.²

Safe blood transfusions can improve blood oxygenation capacity in the anaemic patients,

correct lipoproteinemia, offer blood exchange, and transfer oxygen to tissues, hence restoring bleeding and coagulation abnormalities. Blood transfusions are critical and can save lives in both acute and chronic illnesses.³

The method for blood transfusion is described to the patient, who is then asked to sign a consent document. A blood sample is collected to determine the blood group. Patients are only given blood that is appropriate for their blood group. During a blood transfusion, patients sit or lie on bed. A needle is placed through a vein in the arm. The needle is attached to a tube and a bag of blood. The blood passes through the tube and



into the vein. It can take up to 4 hours to obtain one bag of blood, but it is normally much quicker. Patients can usually go home shortly after, unless they are extremely ill or require a large amount of blood. Patients may experience during and after a blood transfusion.

The patient may feel a slight prick when the needle is first placed into the vein, but should feel nothing during the transfusion. Some patients experience a fever, chills, or rash. This is typically managed with paracetamol or by delaying the transfusion.⁴

Patients who have received a blood transfusion frequently report no issues or concerns. However, mild to serious issues do occasionally arise. Some of the most common consequences from blood transfusions are given here. Even when given the correct blood type, some patients develop adverse reactions to the blood obtained during a transfusion. In some circumstances, the symptoms include hives and itching. A fever following a transfusion is not significant. Some diseases that can be transmitted through blood include Hepatitis B, Hepatitis C, Acquired Immunodeficiency Syndrome (AIDS), Syphilis, Malaria, and many more⁵.

Fever is the body's reaction to the white blood cells in transfused blood. If the patient is also suffering nausea or chest pain, this may indicate a dangerous response. An acute immunological hemolytic reaction is a severe, but uncommon, reaction induced by the patient's body attacking transfused red blood cells. This may cause renal failure due to the blood group incompatibility. Symptoms may include nausea, fever, chills, chest and lower back pain, and black urine. The chance of contracting a virus or another blood-borne infection via a blood transfusion is extremely minimal.⁶

People who donate blood usually give entire blood. Whole blood can be divided into blood products, each of which performs a specific function. This way, a single unit of whole blood can benefit multiple people. And the individual receiving a transfusion only receives the parts that he requires. These blood components or products include cryoprecipitate, packed red blood cells, platelets and plasma.⁷

The WHO's (World Health Organization) Safe Blood Transfusion strategy focuses on voluntary blood donation, haemovigilance, and national coordination of blood transfusion programs. These tactics are effective only when supported by evidence.⁸

Objective

To assess the Frequency of IV transmitted Diseases through blood products among blood donors at AIMTH, Sialkot.

The other goal of our study was to determine the prevalence of HIV, hepatitis B, hepatitis C, malaria, and syphilis among healthy Sialkot blood donors incidence.

Methodology:

An observational retrospective study was conducted in August 2023. The data was collected from June 2022 to July 2023 from Blood Bank of Allama Iqbal Memorial Teaching Hospital, Sialkot. The data was observed and analysed for the frequency of diseases (hepatitis B, hepatitis C, VDRL/syphilis, HIV and malaria) transmitted through transfusion among 3287 Blood Donors⁹.

Independent variable:

- ✓ Age
- ✓ Gender
- ✓ month of admission

Dependent variable:

- ✓ HCV
- ✓ HBV
- ✓ HIV
- ✓ Syphilis (VDRL) Malaria

Results:

Both volunteer and familial replacement blood donors were included as participants. The donors included in our study were 95% (n= 3123) male and 5% (n=164) female. Out of 3287 donors, 53 donors (1.61%) were positive for one of transfusion transmitted diseases.

TTIs	Frequency	Relative Frequency	%
HBsAg	12	0.23	23 %
Anti-HCV	24	0.45	45%
VDRL (Syphilis)	16	0.3	30%
HIV	1	0.02	2%
Malaria	0	0	0%
Total	53	1	100.%

Table - 1: Frequency table of TTIs recorded at IITH

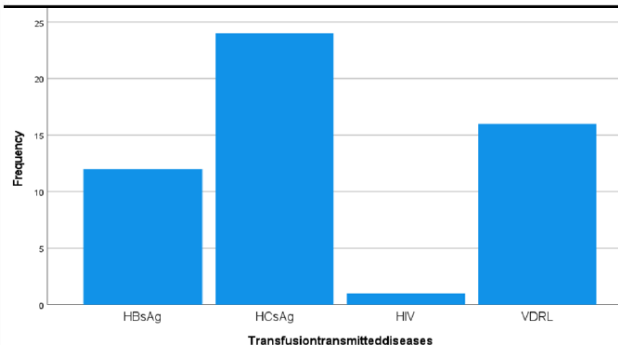


Figure-1: Number of TTIs recorded

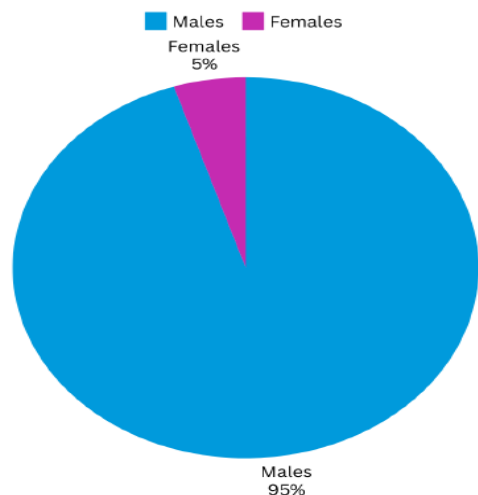


Figure-2: Comparison of Male and Female Blood Donors

Discussion:

According to a current study the incidence of blood transfusion was 42.88 units per 1000 population per year for both men and women and varied from 12.08 units per 1000 population per year.⁹

Blood transfusion is an essential and lifesaving step in the medical practice. However, In developing countries, there is a big problem of supplying safe blood to patients because of the threat of various TTIs. It includes Hepatitis C, Hepatitis B, and HIV etc. which can be life threatening for patients. WHO recommended voluntary non-remunerated blood donation (VNRBD) but this system can't be applied in Pakistan due to social crisis as people prefer paid donation over volunteer ones. In countries like Pakistan, donors belong to a poor socio-economic group and are paid donors, which significantly increase transmission risk¹⁰.

Hepatitis C is more common in this study than other TTIs, and the prevalence of HCV was found to be 0.73% (n=24). Prior research has also indicated an increase in Hepatitis C.¹⁰ The

prevalence of HCV was reported to be higher in many local studies, 3.52%,¹¹ Amjed S (1.3%) in Lahore (2023),¹² Hussain et al. (3.44%) in Multan (2015)¹³ and in a recent study conducted at Khyber Pakhtunkhwa, we observed that the proportion was declining, at 0.316%.¹⁴

Hepatitis-C is the most common viral blood borne infection. The reason for this increase trend is because it is asymptomatic and remains undiagnosed for many years. It came to medical attention when it reached the stage of cirrhosis and hepatic carcinoma. The other reason can be no availability of a vaccine for it. Comparing our numbers to those from other research around the world, we discovered that Nagalo et al. reported a staggering figure of 8.69%,¹⁵ while studies conducted in Ethiopia found comparatively higher figures of 1.7%¹⁵ and in Luanda, Angola figures of 5.1%.²⁵ However, the majority of the studies reported values that were comparable to ours, e.g. 0.14% in Gujrat, India, 0.7% in Eritrea, and 0.36% in Gwalior.^{16,17,18}

The overall HBV seroprevalence in this study was 0.36% (n=12). Studies conducted locally revealed a higher HBV percentage. According to a Shah H study, the percentage of HBV-positive cases in Khyber Pakhtunkhwa in 2023 was 0.855%.¹⁹

Studies carried out across the nation, including those by Memon et al. (1.4%) in Hyderabad (2017),²⁰ Awan et al. (1.09%) in Islamabad (2018),²¹ Arshad et al. (1.7%) in Karachi (2016)²² and Amjed S (0.6%) in Lahore (2023),¹⁸ have reported similar results. However, in Multan (2015), Hussain et al. observed a little higher result of 2.32%.¹³ Globally, a study conducted in Gujrat, India (2023) found a comparable percentage of 0.52%.²² Several investigations, including one conducted in Iran by Farshadpur et al. (2016),²³ expressed a somewhat lower prevalence for HBV. An even lower figure (1 for every 280,000) was found in the 2009 survey carried out in the United States by Zou et al.²⁴ That is most likely due to the population's high degree of awareness and low prevalence in general. A 2023 study conducted in Luanda, Angola discovered a high percentage of 50.2%.¹⁹ The frequency of syphilis in this study was 0.49% (n=16). Additionally, greater rates of syphilis were found in numerous local investigations. In several researches conducted in Islamabad, Awan and Waheed et al. discovered rates of 0.75% and 0.89%.^{21, 25} The percentages for Hyderabad, Lahore, and Karachi were 3.01%, 1.0%, and



1.55%, respectively.^{12,20,22} This may indicate variations in the degree of knowledge about the illness in a certain area. Nevertheless, we also discovered research in Khyber Pakhtunkhwa that had lower rates, as reported by Shah H 0.30%.¹⁹ Internationally, Stokx et al. reported a comparable 1.2% value on a global scale. While India reported prevalence rates of 1.32% from Gujarat.¹⁸ Quintas AE reported a higher value of 20% in Luanda, Angola.²⁵

Moving on, the presence of HIV which was 0.03% (n=1) in this study. The range of reported HIV percentages in numerous other studies is 0.01–0.16%.^{12,13,20,22} This may be related to differences in screening in various settings as well as the partial sensitivity of screening tests. A comparable low number of 0.004% from Iran was reported by Farshaadpour et al.²³ Higher figures have been reported by others, ranging from 0.08% in Gujrat (India), to 0.8% in Eritrea.^{17,18,26} Prevalence rate of 7% was reported in Luanda, Angola.¹⁹

Our findings indicated that there was no malaria parasites are seen. The same was found in Lahore or India study as well.^{12,18} Shah H found that the prevalence rate in Khyber Pakhtunkhwa was just 0.031%.¹⁹ Malaria screening is not used in the majority of wealthy nations worldwide. Nevertheless, it remains a noteworthy transfusion transmissible reaction in endemic nations. Malaria is therefore strictly screened for because it is a serious threat to the local people. In support of this, Ali et al. pointed out that the majority of blood donors in underdeveloped nations are from low-income backgrounds and are commercial donors, which greatly raises the risk of malarial transmission.²⁷

Our study was conducted over a considerable period of time, however it was retrospective in nature. Consequently, all of the limitations associated with conducting the retrospective research also apply in this case. However, the information that is currently available inadequate to give a ballpark estimate of the frequency of TTIs in the study population.

Increasing the quantity of safe blood products on hand for use in emergencies is desperately needed. In addition, this increase ought to be used in conjunction with appropriate blood donation screening to reduce the possibility of transfusion-transmissible infection transmission. Not only do trends change constantly, but so do people's mindsets and the literacy rate.

Conclusion:

The lower data reported in our survey shows that Sialkot residents are aware of TTIs and how to prevent them. They also demonstrate the need for and efficacy of maintaining stringent screening procedures, which is corroborated by additional research. Our reported frequency rate is lower than that of other studies on the same topic that have already been published.

Recommendation

To further reduce the risk of transmission of TTIs in Sialkot, it is necessary to target donors with a low-risk profile, administer a screening questionnaire, have a sufficient supply of high-quality screening tests, and run awareness campaigns for the relevant diseases.

Limitations:

Main limitation is lack of time. We did not have enough time for our study. Unavailability of resources was another limitation which cannot be underestimated.

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