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RESEARCH ARTICLE

PREVALENCE OF TRANSFUSION TRANSMISSIBLE INFECTIONS AMONG BLOOD DONORS IN A TERTIARY CARE HOSPITAL OF DODA REGION OF J&K : A TWO YEAR EXPERIENCE

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Abstract

Introduction: Blood transfusion is a double-edged sword. On one end it can serve as a life saving measure in various surgical and medical emergencies, whereas on other end it can serve as an important mode of transmission of TTI's. Hence to prevent transmission of TTI's from donor to recipient and without compromising its benefits donor blood is screened for TTI's before transfusion of blood.

Aim: To estimate the prevalence of TTI's among healthy blood donors in Doda region of J&K.

Materials and Method: The present study was a two-year retrospective study conducted from August 2019 to July 2021. Blood samples from all the healthy blood donors including replacement and voluntary were screened for five most common and important TTI's.

Result: A total of 2392 blood donors were included in this study and prevalence of HBV was found to be highest among the TTI's which was 0.58%. Prevalence of HIV, HCV and syphilis was found to be 0.12%.

Conclusion: Blood transfusion can serve as a major source of transmission of TTI's if donor blood is not screened properly.In order to minimize the risk of transmission of TTI's and to ensure safe blood transfusion donor blood should be subjected to sensitive screening tests for TTI's before transfusion.

Introduction:-

Blood transfusion can be a mainstay therapy in numerous medical, surgical and obstetric emergencies and is being used since 1930[1]. At the same time it carries various immediate and delayed complications. One most serious and preventable complication is that it serves as an important mode of transmission of TTI's and increases the risk of various infections in the recipient. Most important and life threatening among them are HIV, Hepatitis-B, Hepatitis - C, Syphilis.HIV, HBV and HCV cancause prolonged viremia with carrier or latent state. It has been observed that 12.5% of patients who received blood transfusion are at risk of post transfusion hepatitis[2]. These infections can cause fatal, chronic and life-threatening disorders e.g. HBV and HCV can cause cirrhosis and increase the risk of hepatocellular carcinoma. This demands for the need for safe blood transfusion, which is one of the basic principles of transfusion medicine.

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With each unit of blood transfused, there's 1% chance of transfusion associated problems including TTI's[3].

The aim of this study was to find the prevalence of TTI's among healthy blood donors at a tertiary care hospital in Doda region of J&K.Since this kind of study has not been conducted before in this particular region, this can give us an idea about the disease burden of various TTI's in this specific region of J&K.

Materials And Methods:-

This was a retrospective study, which was conducted at blood bank of GMC Doda using data between August 2019 to July 2021.

Blood donors were carefully selected since this is the cornerstone of safe transfusion practice. Selection process included obtaining proper medical history,performing physical examination and certain laboratory tests. A donor questionnaire and consent form was obtained from the donor prior to phlebotomy.

Exclusion criteria for blood donors:
Paid donors, history of any serious illness, history of major surgical procedure, history of medication, age<18 or >60, weight <50, Hb<12.5g/dl, person with high risk behavior for HIV, history of blood transfusion in last 12 months, recent history of immunization with killed, recombinant or toxoid vaccine, febrile donor, history of covid-19 positive test within last 28 days, history of covid vaccination in last 28 days, pregnant and lactating females.

Blood bags and pilot tubes were labeled with donor identification number and date of blood collection. Serum samples of all the blood donors including voluntary and replacement donors were screened for HIV, HBsAg, HCV using 3rd generation ELISA and VDRL using rapid antigen card. For MP careful examination of peripheral blood film was done.

Human Immunodeficiency Virus Serology:
Merilisa HIV Gen 4 is an enzyme immunoassay for the qualitative determination of HIVp24 antigen and antibodies to HIV-1and HIV-2.

Hepatitis B Surface Antigen Serology:
Merilisa HBsAg is a direct solid phase enzyme linked immunoassay. The microwells are coated with monoclonal anti -HbsAg antibodies and if HBsAg is present in the serum, the sample will give absorbance more than the cut-off value.

Hepatitis C Virus Serology:
Merilisa HCV is a sandwich format microplate enzyme immunoassay for the detection of antibodies against HCV. Microwells are coated withHCV specific recombinant protein (Core, NS3, NS4, and NS5).If antibodies against HCV are present in the sample they will bind to the precoated antigen and the result will come as reactive.

Syphilis Serology:
Syphilis was diagnosed using rapid test card provided by Acculine Diagnostics Pvt. Ltd. Acculine syphilis test is based on lateral flow immune chromatographic double antigen sandwich principle.

Malarial Parasite:
For detection of malarial parasite conventional method of examination of peripheral blood film stained with Geimsa stain was done.

The reactive samples were repeated and labeled as seropositive. The blood bags and pilot tubes were discarded according to biomedical waste management.

Quality Control
Both internal and external quality controls were done.

Results:-

In this study there were a total of 2392 blood donors.

The prevalence of HBV, HCV, HIV and Syphilis is shown in Table I.
None of the donor blood samples tested positive for malarial parasite.

Table I:- Prevalence of HBV, HCV,HIVand syphilis among blood donors.

Year	Total no. of blood donors	HBV	HCV	HIV	Syphilis
Aug 2019-July2020	1102	06	01	02	nil
Aug 2020-July2021	1290	08	02	01	03
Total	2392	14(0.58%)	03(0.12%)	03(0.12%)	03(0.12%)

The overall prevalence of HBV was found to be highest among the TTI's with 0.58% prevalenceas compared to 0.12% prevalence each for HCV, HIV and syphilis.

The age group, which was included in the study, was 18-60 years. It was observed that highest prevalence of HIV, HBV and syphilis was found in 26-35 year age group and of HCV in age group of 20-25 years.

Age wise distribution of TTI's is shown in Table II.

Table II:- Age wise distribution of TTI's.

Disease	Age 20-25	26-35	36-45
HBV	05(35.71%)	06(42.85%)	03(21.42)
HCV	02(66.66%)	01(33.33%)	0
HIV	01(33.33%)	02(66.66%)	0
Syphilis	01(33.33%)	02(66.66%)	0

Discussion:-

Blood transfusion is an important life saving procedure in various medical, surgical and obstetric emergencies, but it also carries with it various immediate and delayed complications. One important complication that is of public health concern is that it carries the risk of transmission of life threatening infections such as HIV, Hepatitis-B, Hepatitis-C, Syphilis, Malaria, Prions disease, toxoplasmosis,etc[4].Out of these HIV, Hepatitis-B, Hepatitis-C, VDRL and Malaria are major public health concerns in developing countries like India.

The prevalence of TTI among Indian population ranges as follows:
HBV:0.66%-12%, HCV:0.5%-1.5%, HIV:0.084%- 3.87%[5].This demands the need for safe transfusion practice which involves proper selection of blood donors and screening of donor blood for TTI's[6]. There are three types of blood donors: Voluntary donor:who donates blood out of his own free will and on humanitarian grounds.

Paid/professional donor: who donates blood for money.

Replacement donor:friend or relative of recipient who donates blood for a particular patient[7].

The aim of this study was to determine the seroprevalenceof HIV, HBV, HCV, and syphilis among healthy blooddonors.

Our study showed seroprevalence of HBV as 0.58%, which was highest among TTI's in this particular geographic region. This is comparable to prevalence of HBV reported by Unnikrishnan B et al (0.87%). and Gupta N etal(0.66%)[8,9].This is less than the prevalence of HBV reported by Kaur G et al who reported it as 1.7 %[10].

The prevalence of HIV in our study was reported as 0.12% which is similar to prevalence of 0.19% as reported by Giri et al[11].This is lower than the seroprevalence of HIV reported by other studies conducted in different parts of India.Srikrishna A et al[12],Pahuja S et al[13] and Pahuja S et al [14] reported the prevalence of HIV as 0.44%, 0.56% and 0.26% respectively.

The prevalence of HCV in our study was 0.12% which is higher than prevalence reported by Amit V et al[15](0.072%). Pallavi et al[6]reported seroprevalence of HCV as 0.28% which is higher than seroprevalence reported by our study.

The prevalence of Syphilis was found to be 0.12% which is similar to that reported by Anjali et al[16] (0.1%). This is lower than the prevalence reported by Pallavi P et al[6](0.28%), Srikrishna A et al[12] (1.6%) and Sushama A et al[14](0.28%).

We observed that seroprevalance of HBV in this region of J&K is comparable to rest of India. However the seroprevalence of HIV, HCV and syphilis is much lower compared to rest of India.

Conclusion:-

Unsafe blood transfusion serves as a major mode of transmission of various infections including HIV,HBV, HCV, Syphilis and Malaria. Therefore it is pertinent to screen the donor blood for these infections using a reliable and sensitive method so as to minimize the risk of transmission of these infections. Also certain measures such as a blood donation camps, seminars, etc. should be conducted time and again to create awareness among the general public regarding the importance of blood donation and modes of transmission of various transfusion transmissible infections.

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