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SEROPREVALENCE OF TRANSFUSION TRANSMITTED INFECTIONS IN A HEALTHY BLOOD DONORS : A 4 YR STUDY DONE IN A TERTIARY CARE CENTRE

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ABSTRACT
Blood transfusion is an effective treatment for saving millions of lives, even though transfusion transmissible infections are a major problem. Transfusion transmitted infections (TTI) can cause threat to blood safety as blood transfusion is an important mode of transmission of Transfusion transmitted infections to the recipient, hence to prevent transmission of these diseases, screening tests on blood bags is an important step for blood safety.
Aim –To study the prevalence of transfusion transmitted infections among blood donors in a tertiary care
hospital in India
Materials and Methods-A retrospective study was carried out over a period of 4 years from January 2021 to December 2024 at the blood bank of a tertiary care hospital in India .Serum samples were screened for Hepatitis B virus, Hepatitis C virus, Human immunodeficiency virus (HIV), Syphilis and Malaria.
RESULTS-A Total of 19305 voluntary and replacement donors were screened. The overall seroprevalence of
HIV ,Hepatitis B virus , Hepatitis C Virus and Syphilis were 17,178,03,03 respectively.
CONCLUSION- Blood is still one of the main sources of transmission of infections such as HIV, HBV, HCV, SYPHILIS. The present study show higher prevalance of Hepatitis B virus ,HIV, HCV and Syphilis respectively in a decreasing order. Proper screening of blood donors ,use of highly sensitive techniques for the detection of TTI S and improved post donation counselling are highly recommended to ensure the safety of blood for recipients.

KEYWORDS- Blood donation, Transfusion transmitted infection (TTI) ,HIV infection, Hepatitis B virus(HBV).

INTRODUCTION-

Blood safety is of utmost importance in transfusion medicine. Blood components such as red blood cells, plasma, fresh frozen plasma ,platelets are widely used in clinical practice. Transfusion

transmitted diseases hamper blood safety and cause a serious public health problem.
Blood donors are the resources of a safe supply of blood and blood products. Screening of transfusion transmitted diseases is also essential for blood transfusion safety and for protecting human life. Transfusion transmitted diseases hamper blood safety and cause a serious public health problem. Blood products used in transfusion can carry bacterial, viral, parasitic pathogen.
Viral organisms commonly transmitted through blood transfusion include Human immune deficiency virus (HIV),Hepatitis B and C virus, Hepatitis A,West nile fever, Cytomegalovirus (CMV),Human T cell lymphotrophic virus(HTLV),zika virus, parovirus B 19 .Bacterial infection include Treponium pallidum(syphilis). Parasistic infection include Malaria parasite ,Trypansoma cruzi, Toxoplasma gondii, babesia microti.
Evalaution of transfusion transmitted infections are essential for assessing the safety of blood supply and monitoring the efficacy of currently employed screening procedure.
The present study was carried out with the aim of determining the seroprevalence of transfusion transmitted infection that includes Human immunodeficiency virus(HIV),Hepatitis B virus(HBV), Hepatiitis C virus(HCV) and Syphilis among healthy blood donors in a tertiary care hospital.

MATERIALS AND METHODS -

It was a retrospective study conducted in the blood bank of a established Medical college from Jan 2021 to Dec 2024 .

STUDY POPULATION-

All blood donors ,whether voluntary or replacement ,during the study period.

INCLUSION CRITERIA-

Blood donors aged between 18 and 60 years , with a Hb conc of 12.5 gm %or more and a body weight of 50kg or more ,no history of hepatitis B ,hepatits C ,HIV or STDs and no history of Jaundice in the past year. Standard criteria for selection of blood donors should be followed.
The Data were collected by studying all the registeration books of blood donors from Jan 2021 to Dec 2024 maintained in the blood bank .Data of all blood donors ,both voluntary and replacement were noted .Information regarding Age, sex ,previous history of surgery ,chronic illness, hospitalization, blood transfusion ,jaundice ,high risk behaviour ,history of vaccination etc was recorded.
All blood donors were screened for HIV ,Hepatitis B ,Hepatitis C ,Syphilis. Blood bank donor cards were used for as a source of information. HIV, HBs ag ,HCV tests we done by enzyme linked immunosorbent assay(ELISA) procedure using the third generation kits.
Syphilis was diagnosed by performing Veneral disease research lab (VDRL) test.
Malaria was diagnosed by peripheral smear preparation method by thick and thin smear .
Blood donors were selected if they fulfilled all the criteria to be eligible for donation as described by the standard operating procedure of our blood bank. Blood donors were selected if they fulfilled all the criteria to be eligible for donation as described by the standard operating procedure of our blood bank. Satisfactory answers from donors and after medical examination ,donors were allowed to donate blood.

EXCLUSION CRITERIA-

All high risk (intravenous drug abusers, homosexuals ,prostitutes and sexual partners of such persons)and professional donors should be excluded .

QUALITY CONTROL-

Internal and external quality control were carried out

RESULTS-

The study included a total of 19305 healthy donors,Out of which 12341 (64%) were Males and 6964 (36%)were females Their ages ranged from 18 to 60 years. Out of 19305 donors 17 donors (0.088%) were HIV positive ,188 donors (0.97%)were HbsAg positive and 07 donors were HCV positive while VDRL reactivity was seen in 05 (0.025%) donors.

The overall prevalence of HIV,HBV,HCV, Syphilis was 0.088%,0.97%,0.020%,0.025% respectively.

No blood donor tested showed positive foe malarial parasite.

Table 1 .Trends in seroprevalence of HIV,HBV ,HCV. Syphilis over the period study.

YEAR	HIV	HBSAG	HCV	VDRL
2021	03	58	03	00
2022	02	40	03	00
2023	06	34	00	03
2024	06	56	01	02
TOTAL	**17**	**188**	**07**	**05**

Out of 19305 donors,12341 were male donors(64%) ,6964 were female donors(36%).

TABLE 2- The overall prevalence of HIV, HBV g , HCV, Syphilis in male and female -

YEAR	2021	2022	2023	2024	TOTAL
MALE	64	43	40	06	203
FEMALE	00	02	03	09	14
TOTAL	**64**	**45**	**43**	**15**	**217**

In Overall period out of total cases ,male patients were 203 cases (93%), and female patients were 14 cases(6.45%) .

DISCUSSION-

The aim of this study was to determine seroprevalence of HIV, HBV, HCV, Syphils among healthy blood donors. Most of the donors in our study were males (64%) aged between 18 to 60 years. This result is comparable with other studies of Anjali et al1, Pallavi et al2 ,Srikrishna et al 3,Pahuja et al4,Adhikari et al5, Arora et al[6] .

The seroprevalence of the HIV, HBV, HCV and Syphilis were 0.088%,0.97%,0.020%,0.025% respectively. Which is comparable with other studies such as Srikrishna et al [3] ,Pahuja et al [4] ,Adhikari et al [5], Arora et al[6] .

HBV incidence is higher in our population. HBV is highly contagious and easily transmitted from one individual to another by transfusion during birth ,by unprotected sex or by sharing needles. HBV indicates a carrier state or an infection . These seropositive donors may progress develop chronic hepatitis, cirrhosis, and even progress to hepatocellular carcinoma .

Syphilis can be spread by sexual contact ,blood transfusion and by vertical transmission .

In case of HIV ,transmission during window period is possible even if each unit is tested for HIV antibodies. The possibility of window period transmission would be minimizes if blood is collected from low risk targeted general public [7] .

However ,blood safety remains an issue of major concern in transfusion medicine.

Nucleic acid testing (NAT) assays are very useful in this situation which has considerably shortened the window period .However ,the cost of this assay is hig which makes it affordable for many centres. There is 1% chance of transfusion associated problems including TTI with each of blood [8] .

Selection of donors with low TTI risk and effective laboratory screening is the very important part

in blood bank processing which has reduced the risk of transmission to very low levels [9,10] .

CONCLUSION-

The study reflects the seroprevalence of the population in our area which may be helpful in planning public health interventional stratrgies.In our retrospective study of 19305 donors , The seroprevalence of the HIV, HBV, HCV and Syphilis were 0.088%,0.97%,0.020%,0.025% respectively .Methods to ensure a safe blood supply should be encouraged .Screening with a safe blood supply should be encouraged. Screening with a better selection of donors and use of sensitive screening tests including NAT assay will definitely reduce the risk of TTI.

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