

Sero - Prevalence of Viral Transfusion-transmissible Infections amongst voluntary Blood donors

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Abstract

This study aimed to determine the Sero-prevalence of viral transfusion-transmissible Infectious diseases among blood donors, namely immunodeficiency virus, hepatitis B and C transmissible infections (TTIs like HBV, HCV), HIV (Human immune viruses). sero-prevalence of viral transmissible infections. This is due to its crucial role in the supportive care of medical and surgical patients. However unsafe transfusion practices may increase the risk of transfusion- Proper monitoring and selection of voluntary donors and testing transmissible infections. The donated blood for specific antibodies for infections agents. Can largely reduce the risk of TTIs virus among blood donors. The study was carried out in the blood bank at Khartoum Teaching Hospital, centre, Sudan. Screening of blood samples for hepatitis B surface Antigen (HBsAg), Human immunodeficiency virus (HIV) and hepatitis C virus (HCV) Antibodies were done using (ELISA) enzyme link immunoassay. The study included (1184) voluntary Blood donors, all were males. The overall prevalence of viral transfusion transmissible Infections were (11.84%). The sero-prevalence for antibody against HIV (6) and hepatitis C Virus was positive in 8 (0.06) and (0.08%) donors respectively while HBsAg was detected in 98 (9.8%) donors. Blood donation saves millions of lives this study showed that the sero-prevalence of hepatitis B and C viruses was high in the community local to community to Khartoum hospital, situation that need for strict criteria for selection of blood donors and also methods of laboratory assays. For detection of infectious agents must be improved. Services are high in Sudan due to the endemicity of infections like malaria, nutritional problem and obstetrical emergencies associated with blood loss. Little is known about the level of these infections in Sudan so; this study was conducted to investigate the sero-prevalence of transfusion transmissible viral infectious diseases in particular human B and hepatitis Immunodeficiency, hepatitis C viruses. The mode of transmission for HIV, HBV and HCV is the same and includes unsafe Sexual sharp materials Contact, using contaminated with body fluid, mother to Child and transfusion of blood and blood Products. Laboratory diagnosis is based on Serological tests to detect the specific Antibody produced against the virus or directly detecting the antigen in blood fluids and Enzyme Linked Immunosorbent Assay (ELISA), Radio Immunoassay (RIA), indirect immunofluorescence, immune-diffusion tests. Aside from HIV, HCV, and HBV, a number of other viral infections transmitted by transfusion of blood products have been described, even though not all have been.

Keywords: Human Immunodeficiency Virus, blood donors, TTIS.

1. Introduction

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the two major causes of chronic liver disease worldwide. Both viruses are hepatotropic, but not directly cytopathic and elicit progressive liver injuries resulting in the end-stage liver disease unless effectively eradicated [1,2]. The well known and routinely used screening serologic techniques Enzyme Linked Immunosorbent Assay (ELISA) and Immunochromatographic test (ICT) were both employed to detect HBsAg and anti-HCV antibodies among male blood donors. Worldwide both viruses are hepatotropic, but not directly cytopathic and elicit progressive liver injuries resulting in the end-stage liver disease unless effectively eradicated [1,2]. In Sudan, the incidence of hepatocellular carcinoma (HCC) is high and increasing, in one study conducted in 1996-1998 among 150 HCC patients, indicated that HBV and HCV are important risk factors of HCC in Sudan [3]. Both human viral infections can be transmitted by various routes, i.e. blood and blood products (e.g. blood transfusion), sexual, oral, vertical and horizontal transmission [4-6].

In Sudan, the incidence Teaching Hospital Demographic studies using interviewing questionnaire were also used to illustrate the possible risk factors for both viral infections. The basic epidemiological data for these viruses might be of

great importance to the programmed managers and health planers, so as to initiate the screening package in the blood banks. A little proper published data of the epidemiology of viral hepatitis is available in Sudan in general region particularly. Thus the current study aimed to determine the seroprevalence and the possible risk factors for HBV and HCV among blood donors in Khartoum Hospital.

2. Materials and Methods

The serum samples of all voluntary blood donors were screened for viral infections. This was a retrospective analysis of consecutive blood donors' records covering the period at MAY 2015. At Khartoum Teaching Hospital which is a Capital Hospital Central blood bank in Sudan. The first step in the blood bank for the potential donors is taking past Medical history and to do physical Examination by a trained doctor. Individuals are required to answer panel of questions on Socio-demographic data (age, education, Residence, etc.), previous illness, and chronic disease, history of blood transfusion and History of jaundice. Those who are apparently healthy, their age range between 18- 60 year and their weights above 45 kg are qualified for donation.

Five ml of blood were drawn from each subject, sera were separated, and tested for HIV, hepatitis B Surface antigen (HBsAg) and antibodies for hepatitis C virus, using (ELISA) test. The data were analyzed was considered statistically significant. Ethical approval for this study was provided by the director of Hospital. Over a period of one month's MAY 2015 Total of (1184) donors; were collected with an average of donations per month. All of the donors were males belonging to those admitted to Khartoum Teaching hospital. Average age of the donors was 35 years (range 18 years to 60 years). The majority of the donors were in their third decade of life.

3. Result and Discussion

All subjects examined in this study were males, because usually females do not donate blood in Sudan. This is because socially and culturally women are not favored to donate blood either to men or women. Usually men of young or middle age are those who can willingly donate their blood.

Results showed that the seroprevalence of HBV and HCV among blood donors in Sudan, this indicates an intermediate HBV seroprevalence [7] and low level of HCV seroprevalence. The study showed that the seroprevalence of HBV is in compliance rate if compared to previous studies conducted in northern and central Sudan (5.1%) and (5.6%) respectively [8,9]. Whereas it was low if compared to southern Sudan (26%)[10]. On the other hand the seroprevalence of HCV among blood donors in Nyala is nearly the same (0.65) as in Khartoum central Sudan (0.08%)[9], whereas it was a bit lower in comparison to northern Sudan (1.3%), Gezira state (2.2%) and southern Sudan (3%) respectively [8,10,11]. Results showed that the ICT used in others study for HBsAg and anti-HCV antibodies screening was less sensitive when compared with ELISA since additional positive samples were detected by ELISA for both viruses (two for HBV and three for HCV), this could be due to short incubation period of the ICT employed in the study. Characteristically short incubation tests do not detect low affinity or low concentration of antibodies as well the classic type of immunoassays which employ longer incubation times allowing reaction to proceed to completion. It should be noted that the ICT may identify HBsAg and anti-HCV antibodies, negative samples reasonably well, but, because of their short incubation times the assays do not always identify low affinity/low concentration of antibodies.

Therefore the potential for false negative results in short incubation test are higher than that in Enzyme Immuno Assay (EIAs) using longer incubation periods and multiple antigens. All over it is clear that antibody to hepatitis B surface antigen (anti HBs) could not be detected at early stage of HBV infection i.e. before three to six weeks post infection and also at late stage three to six months post infection. This could explain why ICT has not detected such samples since it is directed to anti HBs antigen. The same reason could be also attributed to the failure of ICT to detect HCV positive samples. These results obviously showed that the possibility of false negative results could be obtained by ICT which is usually practiced in others Teaching Hospital blood bank as a preliminary screening test and thereby the risk of transfusing infected blood and establishment of new foci of infection exist. [12].

The sero-positive Prevalence of HBsAg was 98 donors (9.8%). However, the sero-positive prevalence of HCV is 8 donors (0.08%). There were 6 sero-reactive donors for HIV (0.06%) in the period of the data collection all donors with sero-positive HCV were between 20 and 40 years old. All donors with sero-positive HBV were between 20 and 40years old. P-value was 0.03 (Table 1). All those above 40 years old were sero-negative for both HCV and HBV (Table 1.). There were only six donors with HIV seropositive (0.6%). They were between 20 and 40 years old. Only one donor (0.1%) was more than 40 years old. Our study was aimed at analyzing g blood Occurrence of HBV, HCV and HIV Transfusion related issues. We examined the Infections among blood donors in Khartoum Teaching Hospital, centre, blood bank by serological methods. It is generally accepted that the diagnosis of Infection by HBV is based on the presence Of the HBsAg in the bloodstream (May 2015).

However, screening of Blood bank donors for HBsAg do not Totally eliminate the risk of HBV infection Through blood transfusion and since The absence of this marker in the serum does Not exclude the presence of HBV DNA In our study of 1184 donors, (11.84%). our study of 98 donors, (9.8%) were Positive for HbsAg, whereas study done at Kasala teaching hospital eastern Sudan Showed 4.5% (2012) Another study Done in Nyala, South Dar Fur State of Western Sudan it was found to be 6.25% (2009). the studies in Many Asian countries showed variation in The prevalence of HBsAg.HBV DNA was. detected among 16-131 (12.2%) anti-HBc positive donors in Iran. The prevalence is low in many countries [12].

Table 1: Age & HIV, HCV, HB S Ag.

Age	HIV		HCV		HBsAg		Total
20-40	6 +ve	1178-ve	5+ve	1178-ve	98 +ve	1066 -ve	1184
41-60	1184	-ve	3+ve	1181-ve	10 + ve	1174-ve	1184

4. Conclusion

This study showed that the sero-prevalence of, hepatitis B viruses was high, HCV and HIV ,is low in the community local to Khartoum Teaching Hospital, a situation that need for strict criteria for selection of blood donors and also methods of laboratory assays for detection of infectious agents must be improved. In addition, appropriate management must be ensured to prevent further transmission of these infections.

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