

Sero-prevalence of immunodeficiency virus, hepatitis B and C and syphilis among blood donors at ElObeid Teaching Hospital, West Sudan

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Abstract:

Objectives: This study aimed to determine the sero-prevalence of transfusion transmitted infections (TTIs), namely immunodeficiency virus, hepatitis B and C and syphilis among blood donors.

Setting: The study was carried in the blood bank at ElObeid Teaching Hospital.

Material and methods: The study included 260 blood donor. Informed consent was obtained from each. Personal and socio-demographic data, information about risk factors such as blood transfusion, sexual partners, intravenous drug usage, tattooing and past history of jaundice all were included in a well designed questionnaire. Screening of blood samples for hepatitis B surface antigen (HBsAg), human immunodeficiency virus (HIV), hepatitis C virus (HCV) and *Treponema pallidum* antibodies were done using immunochromatographic (ICT) strips.

Result: The study included 260 blood donor. All were males. The screening result for antibodies against HIV and *Treponema pallidum* was positive in 2 (0.8%) and 40 (15%) donors respectively. HBsAg was detected in 26 (10%) donors. Screening result for antibodies against hepatitis C virus was negative in all samples.

Conclusion:

This study showed that the sero-prevalence of hepatitis B and syphilis was high in our study population. This mandates very strict criteria for selection of blood donors and also methods of laboratory assays for detection of infectious agents must be improved. On the other hand indications for blood transfusion should be restricted.

Key words: Blood donors, Transfusion-transmitted infections (TTIs), Immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Syphilis.



The demand for blood transfusion services in developing countries is high due to endemicity of infections causing anaemia and high incidence of malnutrition.

Surgical and obstetric emergencies associated with blood loss are also commonly encountered indications of blood transfusion.¹ Infectious agents, including viruses, bacteria, and

parasites, can be transmitted by human blood products. Of major importance are viruses such as human immunodeficiency virus type 1 and 2 (HIV-1/2), hepatitis B (HBV), hepatitis c

Transfusion-transmitted infections (TTIs) remain a major challenge to transfusion services worldwide, particularly in developing countries³. The problem of TTIs is directly proportional to the infection in the blood donor community.⁴ Measures to assure the safety of blood and blood components include use of voluntary donors, donor selection and questioning, laboratory testing for serological markers of infections, maintenance of registries of disqualified

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donors and more recently, the introduction of direct tests for viral nucleic acids⁵. In developed countries risks of transfusion-transmitted viral infections are extremely low due to a combination of donor education, donor screening and new laboratory test procedures⁶. Transfusion transmitted syphilis is not a major hazard of modern blood transfusion and it is not the transmission of syphilis that is worrisome but being a sexually transmitted disease, its presence points towards the high risk of exposure to infections like HIV and hepatitis⁷.

It is generally accepted that the diagnosis of infection by HBV is based on the presence of HBsAg in the bloodstream,⁸ however, screening of blood donors for HBsAg does not totally eliminate the risk of HBV infections through blood transfusion⁹. Routine blood donors screening for anti-HBc has been implemented in some countries resulting in a decrease in the risk of post transfusion HBV infection¹⁰.

The greatest threat to the safety of the blood supply is the donation of blood by seronegative donors during the infectious window period.

In developed countries implementation of moresensitive tests that detect infection earlier, decreases risks of transfusion transmitted viral infection¹¹.

This study aimed to determine the sero-prevalence of TTIs, namely immunodeficiency virus, hepatitis B and C and syphilis among blood donors at ElObeid Teaching Hospital.

Patients and methods:

This is a prospective descriptive study. It was carried in the blood bank at ElObeid Teaching Hospital. A consecutive 260 blood donors were included in the study. Personal and socio-demographic data, information about risk factors such as blood transfusion, sexual partners, intravenous drug usage, tattooing and past history of jaundice all were included in a well designed questionnaire. Screening for hepatitis B surface antigen (HBsAg), human immunodeficiency virus (HIV), hepatitis C virus (HCV) and Treponema pallidum antibodies were done for all donors using immunochromatographic (ICT) strips (CORE Diagnostics, Aspect Court, 4 Temple Row, Birmingham B2 5HG, United Kingdom).

Results:

The study included 260 blood donors. All were males. Age groups distribution is shown in Fig(1). 65% of the patients resided in ElObeid while 35% came from rural areas.

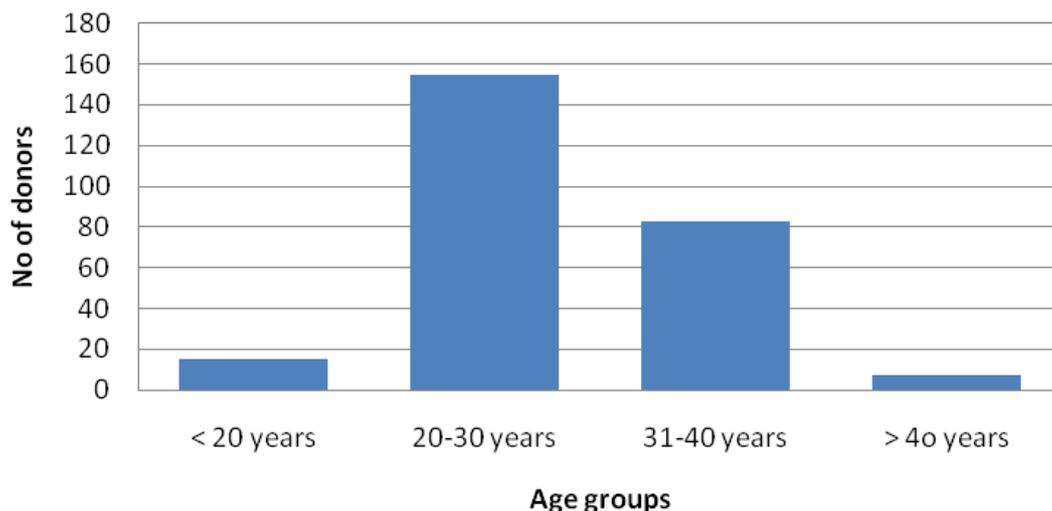


Figure: (1) age group distribution. n=260

Occupations of the study group were illustrated in Fig (2). 32% patients gave history of jaundice while 17% had history of sexually transmitted diseases (STDs) mainly gonorrhoea. History of tooth extraction and cauterization mainly for jaundice was found

in 14% each. Only one person gave history of blood transfusion. Two hundred fifty six individuals were relatives (family) donors and only 4 were voluntary ones. 35% donated blood in the past.



Figure 2 Donors' occupations . n=260

The screening result for HBsAg and antibodies against HIV and *treponema pallidum* was positive in 26 (10%), 2 (0.8%)

and 40 (15%) samples respectively. Screening result for antibodies against hepatitis C virus was negative in all blood samples tested fig (3).

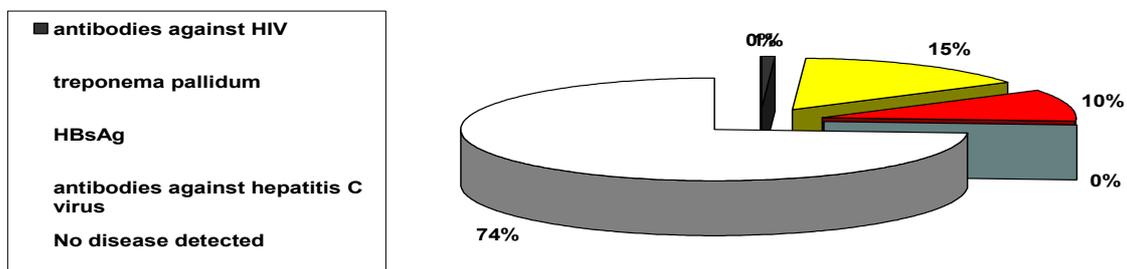


Figure 3 Sero-prevalence of immunodeficiency virus, hepatitis B and C and syphilis among blood donors. n=260

Discussion:

The overall frequency of anti-HIV, anti-HCV, HBsAg and syphilis antibodies were 0.8%, 0.0%, 10%, 15% respectively. The results of anti-HIV were low in our study if compared with studies from Tanzania, Zimbabwe and Democratic Republic of Congo¹²⁻¹⁴. Zimbabwe has one of the highest HIV prevalence rates in the world¹⁵. The absence of hepatitis C is to some extent similar to what was reported by some Sudanese investigators. However, it contrasts reports from Nigeria¹⁶⁻¹⁸. On the other hand the frequency of HBsAg and syphilis antibodies in our group was a bit high compared with the previous African studies. The extensive population movements from inside the country or across the borders, the rapid urbanization and social and cultural changes, all affect the family ties and community behavior resulting in a marked increase in the prevalence of sexually transmitted diseases including hepatitis B infection and syphilis. Measures should be taken to reduce this since syphilis promotes the transmission of HIV and both infections can simulate and interact with each other¹⁹. Although only five blood donors showed the co-existence of HBsAg and antibodies against *Treponema pallidum*, clients with history of sexually transmitted disease should be excluded during donor selection.

The laboratory tests which are used in our blood bank for screening of donated blood (rapid tests) are lagging behind modern technology which used nucleic acid amplification tests. The nucleic acids amplification tests are capable of detecting the infective agents even during the window period, a property which is not available when the rapid tests are used.

Conclusion:

This study showed that the sero-prevalence of hepatitis B and syphilis was high in our blood donors. This mandates very strict criteria for selection of blood donors. Also methods of laboratory assays for detection of infectious agents must be improved.

Acknowledgement:

We would like to thank the laboratory technicians in the blood bank at El Obeid Teaching Hospital for their help in the data collection.

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