

Prevalence of Human T- cell Lymphoma/Leukaemia Virus among Sudanese Blood Donors in Wad Medani, Sudan

Sara A Saliheen¹ , Awad Elseed Mustafa², Sumia Elhag Mohammed³

1. Department of Pathology ,Assistant professor, National Cancer Institute, University of Gezira
2. Professor of Pathology, Faculty of Medicine, U of G.
3. Department of pathology, Medical labrotary, University of Gezira.

Correspondence author: Sara Saliheen , email sarasaliheen@gmail.com

Abstract:

Background: HTLV type I/II is a blood borne infection that can be transmitted via blood transfusion.

Objective: To determine the seroprevalence of human T – lymphotropic virus among blood donors in Wad Medani Central Blood Bank, Sudan.

Methods: A total of 540 serum samples were collected from blood donors who visited the Wad Medani Central Blood Bank from January to July 2013. These sera were screened by ELISA for the determination of antibodies to T- Human Cell Lymphotropic Virus type 1/11.

Results: Only one out of 540 (0.2%) samples was found to be positive for HTLV-I/II while 539 (96.4%) samples were negative.

Conclusion: The seroprevalence of HTLV-I/II among the blood donors in Wad Medani Central Blood Bank was found to be very low, 0.20%. Therefore, there is no need for routine screening of blood donors for this virus. The introduction of these extra serological tests to the tests that already were carried out may have an extra financial burden, but because of the seriousness of the diseases that were caused by this virus, these tests should be carried out.

Introduction:

The Human T-lymphotropic virus is a human RNA (retrovirus).⁽¹⁾ Human T-cell lymphotropic virus type 1(HTLV-1), is also called the Adult T-cell lymphoma virus type1. HTLV-II, a virus closely related to HTLV-I, shares approximately 70% genomic homology (structural similarity) with HTLV/I. HTLV-III and HTLV-IV have been used to describe recently characterized viruses.⁽¹⁾ HTLV is an enveloped, single-stranded RNA virus of the Retroviridae family, subfamily oncovirus.⁽²⁾ HTLV-I/11 are transmitted mainly through transfusion of infected blood and cellular blood products, intravenous drug abuse, from mother to child including breast feeding and sexually⁽²⁾ .This virus has relationship with two types of diseases, HTLV-associated myelopathy (HAM) or Tropical spastic paraparesis (TSP) and Adult T-cell Leukemia/Lymphoma (ATLL). ATLL according to the most recent World Health Organization (WHO) classification of lymphoid neoplasms is defined as a peripheral T-cell neoplasm associated with infection by the human T-lymphotropic virus type I (HTLV-I). Its incidence is (2-5%)⁽¹⁾ . TSP and HAM are the same entities⁽³⁾ . It affects less than 2% of HTLV-I carriers⁽⁴⁾ .

HTLV-I infects 15-20 million people worldwide, with endemic foci in southern Japan, the Caribbean, Melanesia, sub-Saharan Africa, Central and South America. The seroprevalence rate ranges from 3 to 6% in the Caribbean islands to about 27% in southern Japan. HTLV-II is

EDITORIAL

endemic in Amerindian tribes throughout North and South America and in Pygmy tribes in Central Africa, with seroprevalence ranging from 3 to 33%. The high risk of blood transfusion transmitted HTLV-I/II has prompted Japan, USA, several Caribbean countries, Canada, France, Holland, Denmark, Sweden, Portugal, Australia, and Greece to include screening for HTLV I/II in blood banks. Screening programme has been shown to reduce risk of transfusion related transmission in USA. There is a study that was made to determine the seroprevalence of HTLV1/2 among the blood donors in Osogbo, Nigeria in order to highlight the importance of including this in transfusion microbiology services in Nigeria. 14 (3.6%) samples were found to be positive for HTLV-I/II⁽⁵⁾. Previous studies give the prevalence rates of HTLV antibody as 0.018%-0.043% in U.S, 0.01% in France, 3.0% in Japan, 1.5% in Trinidad, 1.2% in Senegal and 0.022% in Saudi Arabia.⁽⁶⁾ A study was conducted at Asvini, Mumbai, Five (1.9%) donors were found seropositive for HTLV-I/II⁽⁷⁾.

In Sudan several studies had been conducted for the prevalence of HBV and HIV among blood donors.^(8, 9, 10) The prevalence of HTLV among Sudanese blood donors had not been studied before.

The aim of this study is to determine the seroprevalence of HTLV among Sudanese blood donors attending Wad Medani Central Blood Bank.

Materials and Methods:

Study setting:

This study was conducted at Wad Medani Central Blood Bank, Gezira state, Sudan during January to July 2013. The Central Blood Bank provides blood to four governmental hospitals and other private hospitals in Wad Medani. About 1600 to 1700 donations are collected in Wad Medani central blood bank monthly.

Inclusion criteria:

Male blood donors attending Wad Medani Central Blood Bank, who were found suitable for donation, were included.

Exclusion criteria:

Subjects who came to donate and were found not suitable by Wad Medani Central Blood Bank criteria for suitable donors.

Methods:

Demographical data were collected from each study subject by using a questionnaire designed for this purpose.

Five mls of venous blood were obtained under aseptic conditions in plain tubes. The serum was stored at 2-8°C till tested. These sera were screened using ELISA KITS HTLV1-11Ab third generation Enzyme immunoassay for the determination of antibodies to T- Cell Human Lymphotropic Virus type 1-11 in serum and plasma (DIA- PRO-Diagnostic Biprobes, -Milano, Italy).

Consent Ethical Clearance:

Informing a verbal consent obtained from donors.

Ethical Clearance was obtained from Faculty of Medicine, University of Gezira.

Results:

During the study period 540 blood donors were recruited. The mean age was 28.72 ± 6.26 SD

EDITORIAL

with range between 20-60 years. The age distribution is shown in figure 1. Two hundred seventy nine (51.7%) of the donors from urban areas and 261(48.3%) from rural areas as shown in figure 2.

The level of education of 384 (71.1%) was higher secondary school as shown in figure 3. Tribal background of the donors showed that 114 (21.1%) were Gaali, 99 (18.3%) were Kowahla in addition to other different tribes residing in Gezira area.

Regarding the occupation, two hundred forty two (44.8%) of the donors were workers as shown in figure 4. Marital status was found to be two hundred ninety eight (55.2%) of them were single and 242 (44.8%) were married as shown in figure 5.

Past history of hospitalization was reported by the study, seventy (13%) in (table1). The history of jaundice was not found in any one of the study subjects. Seventy (13%) had history of dentistry procedures table

2. No one of them had a history of surgical operation or haemodialysis.

Two hundred twenty one (40.9%) of the donors were found to be first time blood donors while 319(59.1%) had repeated blood donation as in table3. Only one (0.20%) with history of blood transfusion as in table 4.

Only one (0.20%) of the 540 blood donors was found to be positive for HTLVI-II as shown in figure 6, his age was 31 years old, from Elfow area.

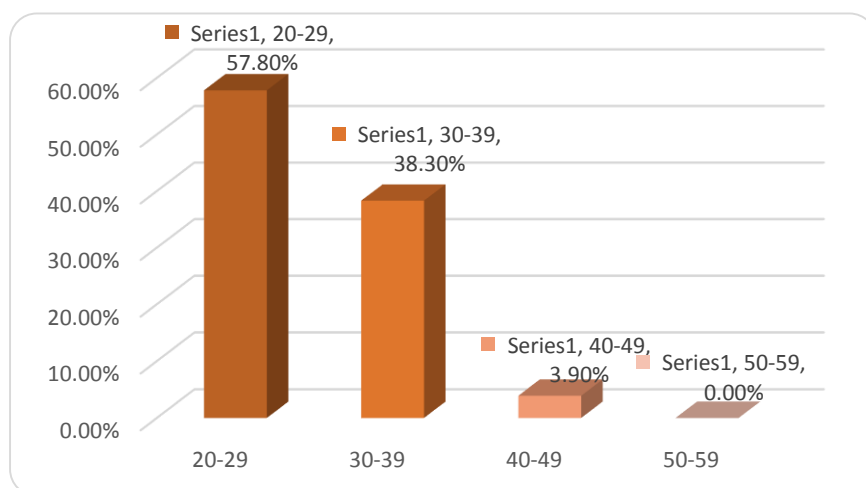


Figure (1): Age Group Distribution. N=540

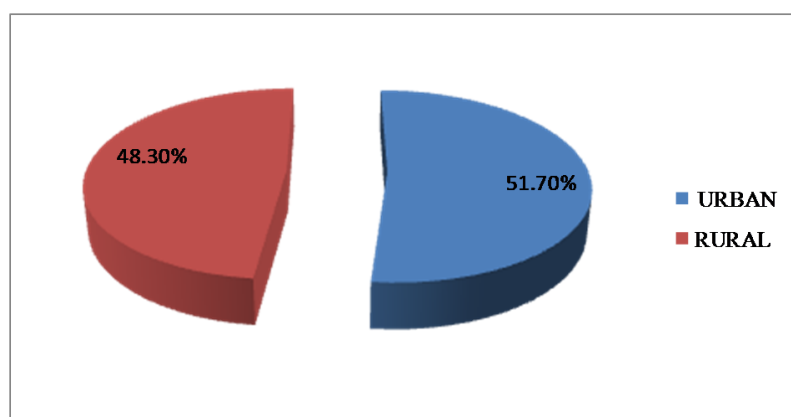


Figure (2): Donors Residence. N=540

EDITORIAL

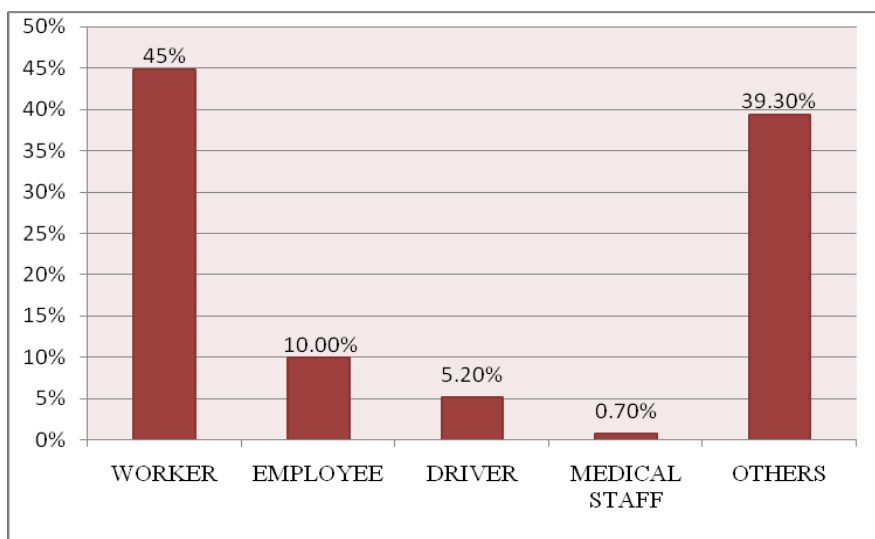


Figure (3): Occupation of the donors. N=540

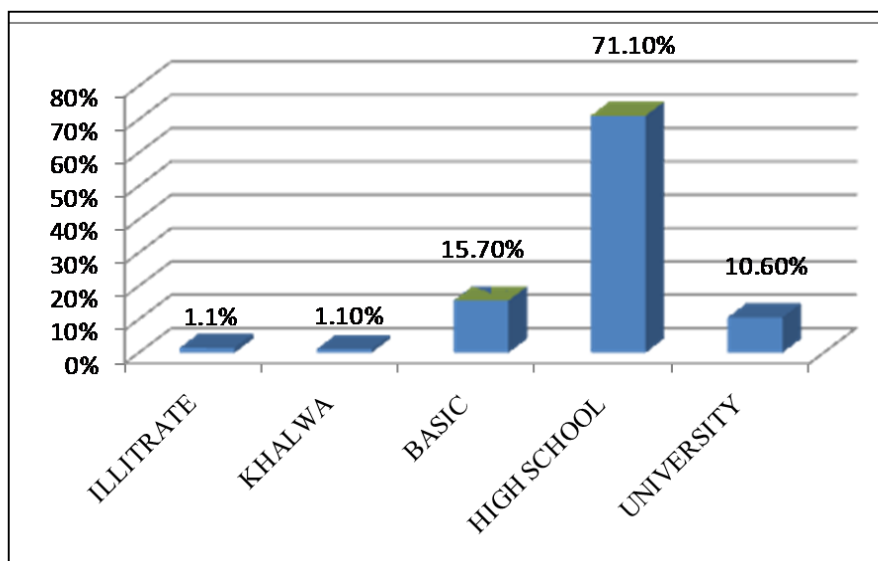


Figure (4): Education Level of the Donors. N=540

Table (1): Past History of the Donors Hospitalization. N=540

Donors	Number	Percent%
Hospitalized	70	13%
Not hospitalized	470	87.0%

Table (2): Past History of the Donors Dental Procedures. N=540

EDITORIAL

Donors	Number	Percent%
dentistry procedure	70	13%
No dentistry procedure	470	87.0%

Table (3): Past History of the Donors Blood Transfusion, N=540

Donors	Number	Percent%
Transfused	1	0.2%
Not transfused	539	99.8%

Table (4): Frequency of Donation. N=540

Donors	Number	Percent %
First time for blood donation	221	40.9%
Repeated donors	319	59.1%

Discussion:

The approach to the selection of blood donors is to ensure the safety of the donor and to obtain a high quality of blood and blood component that is as safe as possible for the recipient. All donors were subjected to be screened for viral infections (hepatitis B, C, HIV and HTLVI/II) and the test for syphilis. Over 20 million persons are infected with HTLV-I/II globally. Continued identification of high risk groups is important for the control of the disease ⁽¹¹⁾.

In our subjects the only one positive case was detected by ELISA kits and confirmation by western blotting or PCR was not carried out. No similar study was conducted in Sudan before to detect the prevalence of HTLV I-II.

The low percentage of HTLVI-II in this study 0.20% in is agreement with study that was conducted in Saudi Arabia (0.022%) ⁽⁶⁾ and Senegal (0.16%) ⁽⁵⁾, but not in agreement with USA which reported 3-5% prevalence, or Japan where the HTLV-I/II has been shown to be endemic, with a prevalence of 27%. A study was carried out in the Caribbean countries where they found the prevalence to be 3-6%, Asvini, Mumbai, five (1.9%). Donors were found seropositive for HTLV-I/II and Central Africa ranges 3- 33%. Similar study that was made to determine the seroprevalence of HTLVI/II among blood donors in Osogbo, Nigeria with prevalence rate 14 (3.6%) samples were found to be positive for HLVI/II⁽⁵⁾. The study which was carried out in Nigeria showed that the prevalence of HTLV-I/II infections was confined into two different age groups –between 18 and 24 (5.9%) and 25 and 31 (12.5%) with other different age groups showing zero prevalence, the only one positive donor in that study was in age group 25-31 years⁽⁵⁾.

In spite of the seropositivity of the positive donor for HTLVI-II and HBV in this study, there were other donors who were found to be positive for both HBV and HIV, but negative for

EDITORIAL

HTLVI-II, so there are no cross reactivity between these viruses. It is important to put in consideration the influx of expatriates from endemic areas for HTLVI-II into Sudan like Chinese, Koreans & Pakistanis, and the immigration from central and West Africa which are areas of high prevalence of this virus.

Conclusion and Recommendations:

The incidence of HTLVI-II among blood donors in this study is 0.20%.

HTLV screening is now carried out in many parts of the world, and so it is recommended to repeat this study in several major blood banks in Sudan so as to be more representative.

References:

1. Mahieux, R.; Gessain, Antoine. Human T-lymphotropic virus From W.W.W "The human HTLV-3 and HTLV-4 retroviruses: New members of the HTLV family". *Pathologie Biologie* 57 (2): 161–6., (2009). Cited in January 2012.
2. David.T Scadden , Andrew R, Freeman, Paul Robertson, Section Editor Martin S Hirsch .Deputy Editor Barbara H Mc Govern, Last literature review version 19.3: Fri Sep 30. 2011 | This topic last updated: Mon Aug. 2011, cited July 2012.
3. David T Scadden, Andrew R Freedman,, Paul Robertson, Section Editor, Martin S Hirsch, Deputy Editor, Barbara H McGovern, Human T-lymphotropic virus type I: Virology, pathogenesis, and epidemiology Last literature review version 17.3: September 2009 | This topic last updated: July 14, 2009, cited July 2012.
4. David T Scadden, Andrew R Freedman, , Paul Robertson, Section Editor, Martin S Hirsch, Deputy Editor, Barbara H McGovern, Human T-lymphotropic virus type I: Disease associations, diagnosis, and treatment Last literature review version 19.3: Fri Sep 30 . 2011 | This topic last updated: Mon Aug 29. 2011, cited July 2012.
5. Terry AlliO.A, Olusoga OgboluD¹, Oluremi, , Okanlawon¹, Uche, L.N. and Muibi, F.A. Seroprevalence of HTLV-I/II amongst Blood Donors in Osogbo, Nigeria volume 6, Number 3 (September 2011) , 177-182.
6. Sami E. Fathalla; Abdulaziz A. Al-Jama,; Iman H. Al-Sheikh *etal* Sero-epidemiological prevalence of human T –cell lymphotropic virus type I among healthy blood donors in eastern Saudi Arabia, From the Dammam Regional Laboratories and Blood Bank , *Annals of Saudi Medicine, Vol 18, No 4, 1998.*
7. Surg Cdr CN Chaudhari, T Shah, Surg Capt RN Misra, Prevalence of Human T Cell Leukaemia Virus amongst Blood Donors, INHS Kalyani, Visakhapatnam. Received: 05.03.07; Accepted : 11.09.07 E-mail: ceanchau@hotmail.com, *MJAFI, Vol. 65, No. 1, 2009.*
8. Abdelbagi M. Nagi, Hadya A. Al Tayeb, and Ahmad, M. A. Seroprevalence of Hepatitis B and C Viral Infections among Blood Donors in Shendi, River Nile State, Sudan. *Research Journal of Medicine and Medical Sciences*, 2007; 2(2): 122-126
9. Mudawi, HMY, Epidemiology of viral hepatitis in Sudan. *Clinical and Experimental Gastroenterology* 2008;1: 9–13
10. Abou, MAA, Eltahir YM and Ali AS, Seroprevalence of Hepatitis B virus and Hepatitis C virus among blood donors in Nyala, South Dar Fur, Sudan *Virology Journal* 2009, 6:146
11. JC Forbi, AB Odetunde, *African Health Sciences*, 2007 September, 7(3):129-132