Prevalence of HIV among blood donors at Juba Teaching Hospital Blood Bank, South Sudan

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Abstract

Objectives

The aim of this study is to determine the prevalence of HIV among blood donors in Juba Teaching Hospital Blood Bank, South Sudan in 2013.

Method and Materials

This is a retrospective study that involved the abstraction of data from registers at the blood bank. Data were collected onto data sheets and entered into a computer database. Statistical analysis was performed using SPSS Version 20 Software. A p value of <0.05 was considered statistically significant.

Results

Out of 1095 blood donors, 1074 (98.1%) were males and 21 (1.9%) were females. The mean age and the range for the whole group was 29+7.16 (15-69) yrs. The prevalence of HIV was higher among males than females 85 (7.9%) vs 1 (4.8%) respectively but this was not statistical significant (p=0.6). The 20 to 29 year age group had the highest prevalence of 49 (57%) with no statistical significance (p=0.3). The prevalence of HIV was 7. % (86) and there were co-infections between HIV and HBV, HCV and syphilis of14 (50%), 5 (18%), 9 (32%) with p=0.7, p=0.1, p=0.8 respectively. Blood group O positive had the highest percentage 58.1 % (n=50) and was the commonest group.

Conclusion

In this study, HIV prevalence is very high among blood donors at the Juba Teaching Hospital blood bank.

Background

Since the first reported cases in 1981, HIV remains one of the most serious health and developmental challenges worldwide [1]. HIV is one of the most frequently recorded transfusion-transmissible infections (TTIs) [2]. HIV screening among blood donors is therefore a key safety issue in addition to screening for other TTIs such as HBV, HCV and syphilis. According to the World Health Organization (WHO) guidelines screening of all blood for TTIs should be mandatory [3]. As a result, there is reduction in TTIs in countries where routine serological screening of donors is carried out [4].

The prevalence rate of HIV among blood donors differs between countries and regions depending on several factors such as the general HIV prevalence, education of the public regarding blood donation, the selection of donors and pre-donation screening [3]. As a result in high income countries, the prevalence of HIV among blood donors is as low as 0.001% while in low income countries it may be higher than 0.5%.

The Republic of South Sudan has emerged from war in the past 9 years. These were years of isolation, but with the advent of peace there is a great movement of people between South Sudan and neighbouring countries and within South Sudan. Countries bordering South Sudan, such as Kenya, Uganda and the Democratic Republic of Congo, have high HIV prevalence rates of 6.3%, 6.5% and1.6% respectively [5]. These high rates and the movement of people is likely to fuel the HIV/AIDS epidemic in South Sudan, and the impact is likely to be felt most in Juba.

Juba Teaching Hospital is a tertiary referral hospital with 500 beds and this is where the main blood bank has been located until July 2014 when the National Blood Bank was inaugurated. This provides services for the whole country. We searched the literature and could not find any information on the prevalence of HIV among blood donors in the Republic of South Sudan.

The aim of this study was to determine the prevalence of HIV among blood donors in Juba Teaching Hospital

Blood Bank.

Method and materials

This is a retrospective study involving analysis of blood donors' records in the blood bank of Juba Teaching Hospital from June to August 2013. These two months were randomly selected from the twelve months of the year.

From the records demographic data (age and sex), transfusion transmissible infections test results (HIV+ve/-ve, HBsAg+ve/-ve, HCV+ve/-ve, and syphilis serology +ve/-ve) and blood group results (A, B, AB, O and Rhesus +ve/-ve) of the donors were abstracted. HIV, HBsAg, HCV and VDRL/Syphilis were tested using Uni-Gold (Trinity Biotech Plc-Ireland), HBsAg (Cypress diagnostic-Belgium) dipstick, Anti-HCV (Cypress diagnostic-Belgium) dipstick, and VDRL (Cypress diagnostic-Belgium) dipstick respectively. Anti-sera (Cypress diagnostic-Belgium) was used to identify respective blood groups. Out of 1195 blood donors, only 1079 had a complete set of variables in the records, and so were included in the analysis.

Ethical clearance was obtained from the Ethical Committee of the National Ministry of Health.

Data were collected onto data sheets and then entered into a computer database. Statistical analysis was performed using SPSS Version 20 Software. A p-value of <0.05 was considered statistically significant. Descriptive statistics were used to summarize the data in the form of means, medians, standard deviation and frequencies. Results are displayed in tables and a pie chart. Chi-square test was used to determine associations of categorical variables. A p-value <0.05 is regarded as statistically significant.

Results

Of the 1095 blood donors in this study, 1074 (98.1%) were males and 21 (1.9%) females. The mean age for the range for the whole group was 29+7.16 (15-69) years: for males it was 29.1+7.18 (15-69) years while for females it was 26.9+5.79 (18-45) years.

The prevalence of HIV in males was 85/1074 (7.9%) and in females 1/21 (4.8%), p=0.6 with the age group 20-29 years with highest prevalence (4.5%) - see Table 1. In the sub-population with TTIs there were 86/420 (20%) HIV+ve, 195/420 (47%) HBsAg+ve, 34/420 (8%) HCV+ve, and 105/420 (25%) VDRL+ve blood donors as illustrated in Table 2 and Figure 1.

Table 1. Distribution of HIV status (number and %) by age groups of blood donors

	Age Group (Years)				Total
HIV positive	<19	20-29	30-39	40-49	
p-Value	5 (0.5%)	49 (4.5%)	24 (2.2%)	8 (0.7%)	86 (7.9%)
		0.9			

Table 2. Distribution of TTIs by sex among blood donors

	HIV +ve	HBsAg+ve	HCV+ve	VDRL+ve	Total
Male	85 (99%)	193 (99%)	34 (100%)	102 (97%)	414
Female	1(1%)	2(1%)	0	3(3%)	6
Total	86	195	34	105	420

Table 3. Distribution of blood groups among blood donors

Blood group	Frequency	Percentage (%)
A+ve	270	24.7
A-Ve	2	0.2
B+Ve	179	16.3
B-Ve	0	0
AB+Ve	21	1.9
AB-Ve	0	0
O+Ve	614	56.1
O-Ve	9	0.8

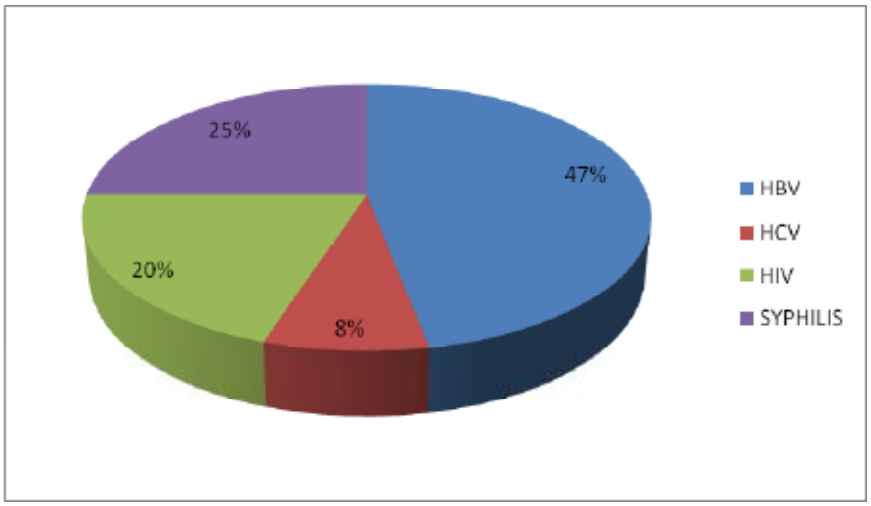

Figure 1. Distribution (percent) of HIV, HBV, HCV and syphilis among blood donors

Table 4. Distribution of HIV status by blood groups of blood donors.

	Blood Groups								Total
	A+Ve	A-Ve	B+Ve	B-Ve	AB+Ve	AB-Ve	O+Ve	O-Ve	
HIV Positive	**18 (21%)**	**0(0%)**	**15 (17.4%)**	**0(0%)**	**3 (3.5%)**	**0(0%)**	**50 (58.1%)**	**0 (0%)**	**86 (100%)**
HIV Negative	252(25%)	2(0.2%)	165(16.4%)	0(0%)	18(1.8%)	0(0%)	563(55.8%)	9(0.9%)	1009
Total	270	2	180	0	21	0	613	9	1095
p-Value	0.7								

Among the blood groups of the donors, blood group O positive had the highest percentage in the whole population (n=614; 56.1%) - see Table 3 - and of those infected with HIV (n=50; 58.1%) and the least were O negative with (n=0) with p=0.7 as shown in Table 4.

There was no A negative, B negative and AB negative among the blood donors. There were co-infections between HIV and HBV, HCV and syphilis of 14 (50%), 5 (18%) and 9 (32%) with p-values of 0.7, 0.1, 0.8 respectively.

Discussion

The first case of HIV/AIDS in the Republic of Sudan was reported in 1986 before the independence of South Sudan. The Sudan National AIDS Control Programme (SNAP) was established in 1987 [6]. While the demand for blood products will continue to be high because of the need of blood in surgical, obsterical, medical and other conditions, HIV poses an immense challenge to transfusion medicine in regions of the world where the quality of blood can not be garanteed. Hence for the safety of blood and its products, strategies to select appropriate blood donors are imporant and all donated blood should be tested for HIV and other transfusion transmissible infections.

The prevalence of HIV among blood donors in this study was 7.9% which is very high. This is higher than studies conducted in Nigeria which report HIV prevalence rates ranging from 0.45% to 7.7% [7]. Also studies conducted in Ethiopia show levels between 3.5% to 5% as reported by Ethiopian Federal Ministry of Health. Other studies in Ethiopia have however reported very high prevalence rates of 16.7% [8], 10.6% and 11.9% [9]. In Ghana a prevalence rate of 3.5% [10] has been reported.

The prevalence of HIV is high in South Sudan mainly because most, if not all, blood donors are family replacement donors rathar than voluntary donors. Schneiber and Busch 1996 [11] assert that commercially remunerated blood and family replacement blood donation are more likely to transmit TTIs than voluntary donors. Indeed the majority of blood donors in sub-Saharan Africa are family replacement donors who have a higher risk for TTIs [12, 13].

In this study there were fewer female blood donors than male donors. Other African studies have shown low female blood donor percentage [14, 15]. This observation has also been reported in many studies done in Asia [16]. Low blood donation by women is attributed to cultural beliefs in South Sudan that women should not donate blood because of the monthly blood loss that occurs during menses. Hence the few who donate blood are those forced to do so when male relatives or friends are not available to donate blood for relatives requiring blood products. There is no scientific basis for this belief, so potential female blood donors should be encouraged to donate blood. This can be achieved by increasing public awareness through the mass media, civil societies, community based organizations, religious leaders, community leaders, women groups, etc. The recruitment and training of more female staff will also encourage more women to come forward and donate blood.

In this study HIV contributes 20% (86) of all TTIs. This percentage is a higher than in the study by Azene *et al* in Ethiopia who reported the contribution of HIV to all TTIs to be 11.7%. The most affected age group was the 20-29 years group (n=49, 57%) of all HIV positive donors, although this was not satistically significant (p=0.9). This is similar to an Ethiopian study where 58.2% of HIV positive blood donors were in the 20-29 years age group [17]. The difference with our study is that it was much larger and covered a period of 4 years.

Co-infection between HIV and the other TTIs does occur since they have the same mode of transmission namely: sexual intercourse, mother to child, and blood transfusion. Barth *et al* [18] noted that the prevalence rates of HBsAg+ve and HCV+ve among HIV positive donors were 15% and 7% respectively. These figures are less than in our study (50% and 18%) which may be due to the fact that our sample size is smaller.

Even though blood group O positive is the most infected and commonest blood group, statistically, it is not significant (p=0.7). This may be due to blood group O being a universal donor and so is easily used as a replacement donor.

Recommendations

In consideration of the results of this study, we

recommend strenghtening of the health system as well as increasing public awareness towards encouraging more voluntary donors than family replacements. Health Education should focus on changing sexual behaviours of youth so as to have an impact in reducing prevalence of HIV among blood donors.

A study is needed to determine the distribution of blood groups among the population.

There is a need to monitor the trends in the prevalence of HIV and other TTIs among blood donors over time and to institute strategies to reduce these infections.

Limitations of the study

1. Data were collected during only 2 months in the year, and from only one blood bank.
2. There were no data on the selection of donors (presumed to be family replacement donors) or their level of education.

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Conflicts of interest

None.

Contributors

All members participated and contributed equally in this research varying from literature review, questionnaire design, data collection, entry and statistical analysis, and typing, discussing and reviewing the manuscript.

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