



Seroprevalence Hepatitis B in Blood Donors at Lubumbashi, DR Congo (Case of Provincial Hospital Sendwe Reference)

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Abstract

In developing countries or economies in transition, many people die because of lack of safe blood, even in some urban healthcare facilities. Blood transfusions can save lives and improve health, but millions of patients did not timely access to safe blood, due to no reliable blood donors. The objective of this study was to determine the prevalence of hepatitis B in blood donors from the Sendwe General Provincial Hospital. This is a retrospective cross-sectional descriptive study on serum markers of hepatitis B study taking place over a period of 12 months from 1 January to 31 December 2014. This study showed that the prevalence of hepatitis B was 6.8%, and 78.7% of donors were male. The mean age was 34.1 ± 7.4 years, ranging from 18 to 57 years. Married, family donors, blood type O and Rh positive were the most represented with 81.1%, 68.6%, 58.8% and 99.3% respectively. A significant association was observed between the prevalence of hepatitis B and age, civil status of blood donors ($p \leq 0.001$). These results should encourage health authorities to the implementation of effective prevention methods to stop the rapid spread of this infection, which is a serious public health problem.

Subject Areas

Public Health

Keywords

Seroprevalence, Hepatitis B, Donors

1. Introduction

Blood transfusion is a medical therapeutic act but it also creates the risk of transmission of infectious agents transmissible through blood to recipients despite advances in blood safety. Therefore, it is essential to detect these infectious agents to prevent transmission. Routine screening for HIV, hepatitis B (HBV) and C (HCV) and *Treponema pallidum*, on all donated blood and blood collection, are among the four major elements of the strategy adopted by WHO in blood safety.

Two billion people worldwide have serologic evidence of HBV infection currently or in the past and 350 million are chronically infected and at risk of developing liver disease associated with HBV. Approximately 15% - 40% of chronically infected patients develop cirrhosis, progressing to liver failure and/or hepatocellular carcinoma. Infection with HBV is between 500,000 and 1,200,000 deaths annually. HBV prevalence varies significantly in different regions of the world [1]. In Sub-Saharan Africa, the prevalence of hepatitis B among blood donors ranges from 9.2% in the Democratic Republic of Congo and 10.7% in Cameroon [2]. The objective of this study was to determine the prevalence of hepatitis B in blood donors through the data from the Sendwe General Provincial Hospital.

2. Materials and Methods

2.1. Site of the Study

Located in the health zone of Lubumbashi, the provincial General Hospital Jason Sendwe is located in the town of Lubumbashi. It is bounded on the north by the Sendwe Avenue, south by the school Avenue, in the east by the Wema High school and West by the Likasi Avenue. Hospital Sendwe with its capacity of 1200 beds is ranked second after the Kinshasa General Hospital, it serves virtually the population of all municipalities in Lubumbashi, but also from the rest of Katanga, two Kasai and South Kivu. Given its importance despite having 1200 beds with an occupancy rate of 66.3%.

2.2. Design of the Study

This is a retrospective cross-sectional descriptive study on serum markers of hepatitis B study took place over a period of 12 months period from 1 January to 31 December 2014. Our target population is all volunteer blood donors, family and paid Along with this health facility during 2014. Consisting of 1421 donors, our sampling is complete. Included in the study all blood donors (volunteers, family, paid) recorded in the Laboratory of reference Sendwe General Provincial Hospital for a first donation. Serodiagnosis on each donation was made by the Abbott Determine HBsAg TM.

The collected data were coded, entered, processed and analyzed using the Epi-Info software 7. The descriptive analysis was performed through the calculation of proportions for categorical variables and the different frequency comparisons were encrypted to using the Chi-square test of Pearson and Fisher's exact test when necessary. We set the p statistical significance < 0.05 . Variables used in this study are: age, sex, civil status,

Categories donor, Blood and RhesusGroup, Status of donor hepatitis B.

This study was approved by related ethics committee besides and mothers sign informed consent and have a whole understanding of this study. Our study had no binding character. Any information collected from donors has been and will remain confidential. Similarly, the names of participants will remain confidential and will not be mentioned in the presentation of results or associated to results in any way whatsoever. They will also be disclosed to any third party.

3. Results

Out of a total of 1421 blood donors in 1119 or 78.7% are male and 302 or 21.3% were female, the sex ratio is about 3.7/1. The mean age was 34.1 ± 7.4 years, ranging from 18 to 57 years. The majority of donors 91.5% were aged between 19 and 45 years. Related to civil status, the category of donors, blood group and rhesus, it appears that married, family donors, blood type O and Rh positive are the most represented with 81.1%, respectively, 68%, 6%, 58.8% and 99.3% (**Table 1**).

Table 1. Breakdown by socio-demographic characteristics of blood donors.

Factors studied	Effective	Percentage
Age		
≤18 years	3	0.2 %
19 - 45 years	1300	91.5%
≥46 years	118	8.3%
Sex		
Female	302	21.3%
Male	1119	78.7%
Civil status		
Single	269	18.9%
Married	1152	81.1%
Categories donor		
Volunteer	230	16.2%
Family	975	68.6%
Paid	216	15.2%
Blood group		
A	341	24.0%
AB	46	3.2%
B	199	14.0%
O	835	58.8%
Rhesus		
Negative	10	0.7%
Positive	1411	99.3%

From **Table 2** that the seroprevalence of hepatitis B is 6.8% while it is around 3.2%, 1.7% and 1% for HIV, HCV and syphilis.

From **Table 3** that the highest prevalence was observed in donors of ≤ 18 (66.7%), single (13.4%), paid donors (8.8%), those sex male (7.0%), people of blood group A (8.5%) and those of Rh positive (6.9%).

Table 4 shows that donors infected with HBV are younger than those who are not infected.

Table 5 shows that there is no significant association between the prevalence of hepatitis B and socio-demographic characteristics such as gender, category of donors, blood group and rhesus blood donor. However, a significant association was observed between the prevalence of hepatitis B and the age and marital status of blood donors ($p \leq 0.001$).

Table 2. Seroprevalence of HIV, HBV, HCV and syphilis among blood donors.

Types of viruses	Total number	Number of cases	Prevalence in%	CI 95%
HIV	1421	46	3.2	[2.4% -4.3%]
VHB	1421	97	6.8	[5.6% - 8.3%]
HCV	1421	24	1.7	[1.1% - 2.5%]
Syphilis	1421	14	1.0	[0.6% - 1.7%]

Table 3. Seroprevalence of hepatitis B according to the sociodemographic characteristics of blood donors.

Factors studied	Total workforce	Number of cases	Prevalence in%
Age			
≤ 18 years	3	2	66.7
19 - 45 years	1300	89	6.9
≥ 46 years	118	6	5.1
Sex			
Female	302	19	6.3
Male	1119	78	7.0
Civil status			
Single	269	36	13.4
Married	1152	61	5.3
Categories donor			
Volunteer	230	11	4.8
Family	975	67	6.9
Paid	216	19	8.8
Blood group			
A	341	29	8.5
AB	46	2	4.4
B	199	14	7.0
O	835	52	6.2
Rhesus			
Negative	10	0	0.0
Positive	1411	97	6.9

Table 4. Comparison of average age of infected donors and not infected with HB.

Status of the donor	VHB		p
	Middle age	Extremes	
Positive	32.4 ± 7.1 years	18 - 47 years	0.01
Negative	34.3 ± 7.4 years	18 - 57 years	

Table 5. Association between socio-demographic characteristics and the seroprevalence of HBV in blood donors.

Factors studied	VHB		Chi-Square Test	IC 95%	p
	Positive	Negative			
Age					
≤18 years	2 (66.7%)	219 (33.3%)	17,45	-	≤0.001
19 - 45 years	89 (6.9%)	1211 (93.1%)			
≥46 years	6 (5.1%)	112 (94.9%)			
Sex					
Female	19 (6.3%)	283 (93.7%)	0.17	1.12 [0.65 to 1.94]	0.68
Male	78 (7.0%)	1041 (93.0%)			
Civil status					
Single	36 (13.4%)	233 (86.4%)	22.43	2.76 [1.75 to 4.36]	≤ 0.001
Married	61 (5.3%)	1091 (94.7%)			
Categories donor					
Volunteer	11 (4.8%)	219 (95.2%)	2.83	-	0.24
Family	67 (6.9%)	908 (93.1%)			
Paid	19 (8.8%)	197 (91.2%)			
Blood group					
A	29 (8.5%)	312 (91.5%)	2.44	-	0.49
AB	2 (4.4%)	44 (95.6%)			
B	14 (7.0%)	185 (93.0%)			
O	52 (6.2%)	783 (93.8%)			
Rhesus					
Negative	0 (0.0%)	10 (100%)	0.74		0.50
Positive	97 (6.9%)	1314 (93.1%)			

4. Discussion

We noted a male predominance in our study (78.7%). The breakdown of donors by sex varies by country. We noted a male predominance in Madagascar, as in other countries such as Burkina Faso, Tanzania, Eritrea, Greece, northern India. In other countries like Britain have a female predominance. The male can be explained by typical African be-

lief stating that men are healthier and stronger than women [3]. Obstetric gynecology factors such as menstrual cycles, pregnancy, breastfeeding may also influence this trend. These factors may prevent many women to donate blood.

This study found a prevalence of HBV, 6.8%, which is close to Batina [4], Kisangani, and all by Baleka [5] Kinshasa and Koné and all [6] in Mali. The highest values were obtained in the meta analysis Nigerian Musa and all who found a value of 14% of voluntary blood donors [7] in the study and all Tanko Ghana [8], that of Cameroon made by Noah Noah [9], and all of Viet in Vietnam [10]. Lower prevalences were found; 4.68% in the Ivory Coast by N'DriN'Guessan [11], 3.21% in Madagascar by Rakotoniaina In India in the study and all Bamanahali in Karnataka, which had 2.12% [12], Secunderabad in that of Sukruthra 2009 and all that gives 1.28% [13], Pakistan, Syed Mukhtar was 1.97% [14], Congo in Kamina in the study of Kabamba and Kabila with 1.6% [15] Bukavu and that of 3.7% made by all and Namululi [16]. In Namibia found that 0.6% Mavenyengwa and all [17], 0.39% in Iran and all that is Mohammadali [18]. This figure reflects the high endemicity of hepatitis B virus in the population studied. It also confirms the presence of hepatitis B in the general population in the DRC. We believe that highly endemic countries are generally countries with low levels of hygiene and is a strong or high transmission of STIs. Probably the high prevalence of hepatitis B is linked to sanitation and the lack of sufficient prevention of STIs in our midst.

Our study showed that female blood donors had a prevalence of 6.3%, while it was in the order of 7.0% among males, but this difference was not statistically significant. This can be explained by way of sexual transmission of this viral disease. The explanation we can advance for males compared to females is the role of socio-cultural characteristics present only in men, such as circumcision. But other reasons may be a possibility of porting from birth with the mother to child transmission, blood transfusions and other ritual scarification.

In terms of the category of donors, it should be noted that in pay and family donors, the prevalence of hepatitis B was 8.8% and 6.9% respectively, while it is 4.8% among volunteer donors without this statistically significant. This can be explained by the fact that most blood donations in Sub-Saharan Africa is done by family members of the recipient.

The highest prevalence was in the age group ≤ 18 years (66.7%). This study showed that donors whose age is equal to or less than 18 was predominant, income close to the study of Ghana found that the age group between 10 to 20 years [8]. And that of Batina takes the age group 17 to 24 years [4]. This high prevalence of hepatitis B among youth suggests a serious public health problem because of HIV status HBsAg may explain the occurrence of cirrhosis or hepatocellular carcinoma of the liver.

5. Conclusions

Carriage prevalence of HBsAg among blood donors is high and warrants routine screening of this serum marker in every blood donor to reduce transfusion risk. Our study shows that 78.7% of donors were male. The mean age was 34.1 ± 7.4 years, rang-

ing from 18 to 57 years. Married, family donors, blood type O and Rh positive were the most represented with 81.1%, 68.6%, 58.8% and 99.3% respectively. Our results showed that hepatitis B is common among blood donors at the Provincial Janson Sendwe hospital with a prevalence of 6.8%.

Implementation of strategies for transfusion safety, including a provision based on voluntary blood donation and unpaid, effective public education about blood donation, donor selection and quality assured screening applied to all the blood, can prevent transmission of HBV. The prevention of hepatitis B can also be passed by immunoprophylaxis, by vaccinating people at risk of this major public health problem.

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