

Original Research Article

Prevalence of carriage of HBs antigen among volunteer blood donors in Kisangani, Democratic Republic of Congo

ABSTRACT

INTRODUCTION: Blood safety is a serious public health concern for health authorities in sub-Saharan African countries. Blood transfusion is a major mode of transmission of viral hepatitis B. The objective of this study was to determine the prevalence of carriage of HBs antigen among volunteer blood donors (VBD) in Kisangani.

METHODS: A cross-sectional study was conducted at the Provincial Blood Transfusion Center in Kisangani from 1 January to 31 December 2015, involving 2,298 volunteer blood donors. Data was collected anonymously from blood donor records and registers taking into account the following variables: age, sex, occupation, educational level, donor status, and residential setting. The HBs antigen was demonstrated by the Alere Determine test. Other markers of viral hepatitis B have not been sought among VBD because they are not available in National Blood Transfusion Program of Democratic Republic of Congo.

RESULTS: The prevalence of HBs antigen was 6.5% among volunteer blood donors in Kisangani. It was higher in subjects were 20 to 29 years old (9.15%), males (7.22%, p-val 0.001), without profession (8.26%), low education (12.1%, p-val 0.001), new donors (9.24%, p-val 0.001), predominantly living the Mangobo and Kabondo communes.

CONCLUSION: The prevalence of HBs antigen was relatively low in VBD in Kisangani (6.5%). But this rate remains high in this group of donors yet renowned less risky. To reduce this risk of transfusion and further secure blood recipients, policy makers should strengthen the education of the population and the technical capacities of the Provincial Blood Transfusion Center for screening for hepatitis B. Immunization against hepatitis B should be systematic across the country, targeting in particular the young people who constitute the majority of VBD in our country.

KEY WORDS: Prevalence, carriage, HBs antigen, blood donor, Kisangani, DRC.

INTRODUCTION

Blood safety is a serious public health concern for health authorities in sub-Saharan African countries. For this reason, much effort has gone into developing measures to reduce the risk of transmission of infectious agents by blood transfusion [1]. Despite this, blood transfusion is a major mode of transmission of viral hepatitis B, particularly in sub-Saharan Africa, where high prevalence of blood-borne diseases is found in the blood donor population [2, 3]. With a prevalence of asymptomatic HBV carriage estimated at 3-22% in blood donors, viral hepatitis B screening is performed on less than 50% of blood bags in most African countries [4, 5]. The Democratic Republic of Congo is located in the highly endemic area where viral hepatitis B. Blood transfusion constitutes consequently a serious threat to blood recipients. The results of previous studies relating to this topic across this country among blood donors of all categories (family, paid, volunteer) showed prevalence ranging between 5.4% and 9.2% [6-8]. However, there is little data available on a specific group, the only group of volunteer

blood donors, considered to be less risky. It is in this context that this study is conducted. It aims to determine the prevalence of carriage of HBs antigen in volunteer donors of blood (VBD) in our country that has undergone demographic changes following the wars and after many interventions in terms of supply of reagents in capacity building of staff [8, 9].

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47 METHODS

This is a cross-sectional study conducted at the Provincial Center for Blood Transfusion (PCBT) in the city of Kisangani. Its mission is to ensure a safe, stable and cost-effective supply of blood products and to ensure the proper use of products in hospitals in the city and the rest of the province. The study population was composed of all subjects who volunteered to donate blood to PCBT during the study period from January 1 to December 31, 2015. Thus 2298 VBD were counted, including 1896 males and 402 females, 18 to 60 years old. Data was collected anonymously from blood donor records and registers taking into account the following variables: age, sex, occupation, educational level, donor status, and residential setting. The HBs antigen was demonstrated by the Alere DetermineTM HBsAg test (Chiba, Japan). Other markers of viral hepatitis B have not been investigated among VBD because they are not available and are not recommended by National Blood Transfusion Program of Democratic Republic of Congo. The data collected were grouped and presented through the frequency tables. For the comparison of proportions, chi-square of Pearson was used at a significance level of 0.05.

62 RESULTS

Table I describes volunteer blood donors by socio-demographic characteristics, their donor status, and their residential environment.

Table I. Description of volunteer blood donors by socio-demographic characteristics, their donor status and their residential setting.

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Characteristics	N (%)
Age (years)	
<20	451 (19,62)
20-29	1201 (52,26)
30-39	530 (23,06)
40-49	91 (3,95)
50-59	22 (0,95)
60-65	3 (0,13)
Sex	
Male	1896 (82,5)
Female	402 (17,5)
Profession	
Pupils	842 (36,64)
Students	315 (13,7)
Nurses	45 (1,95)
Traderpeople	254 (11)
Teachers	88 (3,8)

Jobless	754 (32,8)
Level of education	
Illiterate	115 (5)
Primary	160 (6,97)
Secondary	1255 (54,61)
Superior	768 (33,42)
Donor status	
Former	1714 (74,59)
New	584 (25,41)
Residential setting	
Mangobo	734 (31,94)
Makiso	322 (14,01)
Tshopo	489 (21,27)
Kabondo	712 (30,98)
Lubunga	23 (1)
Kisangani	18 (0,79)

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69 The majority of blood donors were 20 to 29 old years (median age 27.5 years), males, pupils,
70 secondary education, former donors and predominantly from the Mangobo and Kabondo
71 communes.

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73 Table II presents the prevalence of the carriage of HBs antigen among volunteer blood
74 donors.

75 Table II. Prevalence of HBs antigen carriage among volunteer blood donors.

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HBs antigen	n (%)
Positive	149 (6,5)
Négative	2149 (93,5)
Total	2298 (100)

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78 Among 2298 volunteer blood donors, 149 of them were carriers of the HBs antigen in the
79 blood, a prevalence of 6.5%.

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85 Table III illustrates the prevalence of carriage of HBs antigen among volunteer blood donors
86 by socio-demographic characteristics, donor status, and residential setting.

87 Table III. Prevalence of carriage of HBs antigen among volunteer blood donors by socio-
88 demographic characteristics, donor status, and residential setting.

Characteristics	HBs Antigen N	HBs positive (%)	P-val
Age (years)			
<20	451	15 (3,32)	
20-29	1201	110 (9,15)	
30-39	530	21 (3,96)	
40-49	91	3 (2,9)	
50-59	22	0 (0)	
60-65	3	0 (0)	
Sex			
Male	1896	137 (7,22)	0,001
Female	402	12 (2,98)	
Profession			
Pupils	842	61 (7,24)	0,02
Students	315	9 (2,85)	
Nurses	45	2 (4,44)	
Tradespeople	254	12 (4,72)	
Teachers	88	3 (3,4)	
Jobless	754	62 (8,26)	
Level of education			
Illiterates	115	14 (12,17)	<0,001
Primary	160	15 (9,37)	
Secondary	1255	89 (7,09)	
Superior	768	31 (4,03)	
Donor status			
Former	1714	95 (5,54)	0,001
New	584	54 (9,24)	
Residential setting			
Mangobo	734	71 (9,67)	
Makiso	322	11 (3,41)	
Tshopo	489	17 (3,88)	
Kabondo	712	48 (6,74)	
Lubunga	23	0 (0)	
Kisangani	18	0 (0)	

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The prevalence of HBs antigen carriage was higher in the 20 to 29-year-old, male, jobless, illiterate population, living predominantly in the Mangobo and Kabondo communes.

DISCUSSION

1. Prevalence

In this study, the prevalence of carriage of HBsAg in VBD was 6.5%. This prevalence is higher than that found in Kinshasa in 2005 (3.63%) and Kisangani in 2004 (3%) [6, 9]. On the other hand, it is lower than that found by Mbendi et al. in Kinshasa-East in 2001 (9.2%) [8] and results reported by other authors in Africa and Cameroon (10.8%) [10], Ghana (8.2%) [11] in Angola (15.1%) [12] and Côte d'Ivoire (12.5%) [13]. This relatively low prevalence of DBS in Kisangani would be underestimated by the fact that other immunologic markers of viral hepatitis B are not being sought by the Provincial Blood Transfusion Center in Kisangani City — just like HBsAg, HBcAg, HBcAb, HBeAg, HBeAg — and excluding at risk individuals when recruiting VBD. Mutations affecting the HBs antigen may make it undetectable by serological tests may also justify the prevalence found in this study [14].

2. Age

The most affected age group in our study is the one between 20 and 29 years old. This result is similar to those of Dongdem JT et al. in Ghana [15] and Noah ND et al. in Cameroon [10]. This study population consisted of a majority of young people, which is characteristic of the population and blood donors of developing countries [8].

3. Sex

Obstetrical factors limiting blood donation in female VBD (pregnancy, breastfeeding for less than 6 months, menstrual period) and the role of socio-cultural characteristics only present in men such as circumcision argue in favor of a prevalence high carriage of HBs antigen in male VBD [16,17].

4. Profession and level of education

Students, teachers and blood donors of superior level are less infected with hepatitis B. High levels of education about infection patterns and preventative measures against viral hepatitis B seem to explain this low prevalence these categories of VBD, which should be privileged over others (jobless and pupils).

5. Donors status

The weak carriage of HBs antigen observed in regular VBD can be justified on the one hand by strengthening their capacities on the means of prevention of transmissible diseases by blood transfusion during different blood drive campaigns across the city, and secondly by their loyalty in time with the assistance of associations of VBD through the city of Kisangani.

6. Residential setting

VBD living in the communes Mangobo and Kabondo represent more than half of HBs antigen carriers. The PCBT regularly organizes more blood drives in these two communes than in others. This fact may explain this finding. This deserves further exploration by analytical studies that should be conducted later.

CONCLUSION: The prevalence of HBs antigen was relatively low in VBD in Kisangani (6.5%). But this rate remains high in this group of donors yet renowned less risky. To reduce this risk of transfusion and further secure blood recipients, policy makers should strengthen the education of the population and the technical capacities of the Provincial Blood Transfusion Center for screening for hepatitis B. Immunization against hepatitis B should be systematic across the country, targeting in particular the young people who constitute the majority of VBD in our country.

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