



Research Article

JMR 2019; 5(3): 127-129

May- June

ISSN: 2395-7565

© 2019, All rights reserved

www.medicinarticle.com

Received: 17-05-2019

Published: 20-06-2019

Presence of anti-HBc antibodies in antigene negatives HBs blood donors at the central hôpital of Yaounde

Ngo Sack Françoise F¹, Tchouanti Njomgang Ornella¹, Ateba Pulchérie², et Piameu Junior²

¹ Faculté of Médecine and Pharmaceutical Sciences/ University of Douala (FMPS/ UD), Douala, Cameroon

² Ecole des Sciences de la santé/Université Catholique d'Afrique Centrale (ESS/UCAC), Yaounde, Cameroon

Abstract

Introduction: In Cameroon, blood transfusion safety is a real public health problem. It is one of the African countries where screening for HBsAb is not systematic in blood donors, which can expose the beneficiaries of these donations to possible viral hepatitis B (VHB) infections. **Methodology:** We carry out a descriptive study at the Yaoundé Central Hospital blood bank during the period from August to October 2018. It was intended to determine the residual risk of transmission of VHB related to the presence of HBcAb in blood donors tested negative to HBsAg. The immunochromatographic technique was used for the detection of total HBcAb in blood donors tested negative for HBsAg, HCV, HIV and TPHA markers. The viral markers, HBsAg, HIV, HCVAb, and TPHA, were tested by ARCHITECT, an apparatus which uses the immunological principle of chemiluminescence. **Results:** Of the 148 donors registered in the study, we had 129 men and 19 women. We obtained an overall transmission risk of HBV related to the presence of HBcAb of 43.24%. This risk was 47.37% for family donors ($p = 0.03999$) and 27.3% for volunteers. No significant association was found between the sex of the participants ($p = 0.3762$), age ($p = 0.7403$), donor regularity ($p = 0.4587$) and HBcAb frequency. **Conclusion:** In view of these results, the HBcAb remains very high in the blood donors tested HBsAg negative in Cameroon. To complete this study, we suggest the screening for viral DNA in donors who are tested HBsAg negative and HBcAb positive to eradicate this residual risk of HBV transmission through blood transfusion.

Keywords: HBcAb, Risk of contamination, Transfusion safety.

INTRODUCTION

The World Health Organization (WHO) estimates that two billion people have been exposed to the viral hepatitis B virus (HBV); one in three people, and nearly 10 to 30 million new infections a year. Chronic carrier numbers are estimated at more than 350 to 400 million, with nearly 1 million deaths each year [1]. In Cameroon, a country of high endemicity, the markers of the hepatitis B virus are found in about 12% of the population [2]. HBV is highly contagious, is transmitted by skin breakthrough or mucosal contact with blood or other contaminated body fluids. It can therefore be transmissible by transfusion. Routine screening for HBV is done by looking for HBsAg (HBsAg) on all donated blood. This screening significantly reduced the risk of HBV infection by blood transfusion. However, there is a residual risk of HBV transmission in view of the kinetics of appearance of its viral markers. This risk could be secondary to three factors: a viral variant not recognized by certain reagents (mutated HBV), a blood donation by a recently infected subject (silent window), an infectious blood donation by a chronic seronegative carrier (occult hepatitis) [2]. All of these factors could lead to the development of post-transfusion hepatitis B (BPHP). Such a situation raises the question of the prevalence of total HBcAbs in blood donors tested HBsAg negative at the Yaoundé Central Hospital blood bank.

METHODOLOGY

From July 1st, 2016 to January 27th, 2017, a search for HBc antibody was conducted in blood donors at the Central Yaounde Hospital (HCY) blood bank. Informed consent was obtained for all subjects and the study obtained clearance from the Institutional Research Ethics Committee for Human Health of the School of Health Sciences. The study was done on any blood bag from the HCY blood donor, consenting, favorable to medical selection, and tested negative for HBsAg, Ac HCV, HIV, and TPHA markers. Donors were recruited as they arrived at the blood bank. A simplified fact sheet on age, sex, marital status and HBs serology, occupation and type of donor was completed by an investigator. After the questioning and collection of the data on the card, the donors were divided into two groups: the family donors (occasional donors intervening in the framework of an assistance to a sick relative) and the voluntary donors (donors

*Corresponding author:

Nyakio Olivier

Faculté of Médecine and
Pharmaceutical Sciences/
University of Douala (FMPS/
UD), Douala, Cameroon
Email: fifisack@hotmail.fr

coming from make a donation on their own without any obligation and unpaid).

The collected data was captured, stored and analyzed using the EPI INFO version 7 software. The graphics were made using the Microsoft Excel 2013 software. The statistical tests used to analyze the links between the qualitative variables were the chi-square test and the logistic regression. The significance level of the study was set at 5% (0.05) for the analyzes performed.

RESULTS

Our sample consisted of 148 blood donors including 129 (87.16%) males and 19 (12.84%) females, for a sex ratio of 6.78 m / f for men. The age of donors ranged from 18 to 60 years, with an average age of 30 years. The most represented age group was 20-30 years, with a frequency of 34.45%. Family donors accounted for 77.55% (115), and volunteer donors accounted for 22.45% (33). In the study, 54 people (36.73%) were regular donors, that is, people who had done at least one previous blood donation in the last 12 months, and 94 (63.27%) new donors (people being on their first blood donation). Of the 148 donors included in the study, 64 were positive for total BChAb or 43.24% of cases.

The percentage of HBcAb-bearing donors was compared to socio-demographic data (age, sex, donor types (volunteer or family)) of the donor population using the chi-square test. The association was significant for a p-value less than 0.05. The residual risk of HBcAb was significantly elevated in familial donors ($p = 0.039$) (Table 1).

In the HBbA positive population, 8.19% were vaccinated against HVB.

Table 1: Association entre variables sociodémographiques et la sérologie

Variables d'exposition	Catégories	Effectifs	Nombre de positifs (taux en %)
Classe d'âge	[18-20]	7	1 (14,28)
	[20-30]	75	33 (44,00)
	[30-40]	51	24 (47,05)
	[40-50]	12	6 (50,00)
	[50-60]	3	0 (0)
p-value	0,7403		
Sexes	Masculin	129	54 (41,86)
	Féminin	19	10 (52,63)
p-value	0,3762		
Type de don	Familiale	115	54 (47,37)
	Bénévole	33	9 (27,27)
p-value	0,03994		
Régularité du donneur	Nouveau	54	21 (38,89)
	Régulier	94	42 (45,16)
p-value	0,45879		

DISCUSSION

The sample consisted of 148 donors, we found a sex ratio of 6.78 in favor of men (87.16%). This figure corresponded to the one found by Têko *et al* in 2013 in Togo still favoring men (sex ratio = 7) [3], and was much higher than that found in France in 2012 (sex ratio = 1.007) [4]. This result could be explained by the selection conditions of female donors (10 days before and 10 days after menstruation). The most represented age group was 20-30 years old, the average age of 30 years and 75% of donors were under 35 years old. These results were similar to those of Essomba *et al*, who found in 2015 in Douala an average age of 31.5 years [5]. The young population is generally more solicited in Cameroon for replacement donations because it is more available and has fewer constraints (chronic diseases) to donate blood and has a better physiological state. Of the donors included, 22.45% were volunteers versus 4.1% found by Essomba *et al* in 2015 [5]. It could well be said that this increase reflects a change in mentalities in favor of the culture of voluntary blood donation, but there was a train disaster (October 21, 2016 in Eséka-Cameroon) which resulted in the death of several and caused more than 500 serious injuries). The latter urgently needed a blood transfusion for their care, the country had deployed all its means of communication for donations of blood to stimulate the population to come donate) that occurred during the period of our work and may have skewed our sample by increasing it. Excluding all volunteer donors who helped the wounded, we would find 4.34% of volunteer donors. WHO states that the largest proportion of donors (90%) are family replacement donors [1]. In addition, the rate of regular donors was 36.77%; but it was 17.5% in 2011 according to Noah *et al*. This has shown a low potential for donor loyalty [6]. During the analysis, the fact was that the large proportion of regular donors were volunteers, and the volunteers were almost from awareness raising to help the wounded of the disaster. The study showed an overall prevalence of 43.24% HBbAAC, which was lower than that found by Noah *et al* (75.74%) with the Immunoassay MONOLISA® method in a study in the same bank of blood in 2011 [6]. This could be explained by the new infection detection technique used at the Yaoundé Central Hospital Blood Bank, ARCHITECT, which is more sensitive and specific and also by the medical selection of donors who have become very rigorous. Many results in Africa have corroborated ours: a rate of 57% was reported by Biwolé *et al* using the ELISA technique, in a similar study conducted at Laquintinie Hospital in Douala in 2015 [2]. Têko *et al* in 2013 had also used the ELISA technique and found in Lomé (Togo) that 53.9% of the donors included in their study had anti-HBc antibodies [3]. Japhet *et al* found 13% for the BCABA rate in Nigeria in 2011 [7]. According to Zampino *et al* in 2015, HBV infection is highly endemic in these countries [8]. Zeinab *et al* reported a rate of 16.6% in Egypt in 2013, and Mohammad *et al*. A rate of 19.8% in India in 2011 [9, 10]. For Zampino *et al*, HBV infection has intermediate endemicity in these countries [8]. In 1995, Allain *et al* evaluated the utility of screening for BCAHB in England, 1.29% were positive for HBcAb after screening with an Abbott EIA [11]. Manzini *et al* found a rate of 4.85% in Italy in 2007 [12]. The rate of HBeAb found in us is much higher because Europe is a zone of low endemicity for HB. Of the 43.24% found positive for HBcAb, 8.19% were vaccinated, this could reduce this risk found. However, the low vaccination coverage against HVB in Cameroon makes this proportion negligible. Like Biwolé *et al* in Douala in 2015, the rate of HBbAc was significantly elevated in familial donors ($p = 0.0399$), as in volunteer donors [2]. Numerous studies have shown that family or replacement donors and paid donors have a higher prevalence of transfusion-transmissible infections than unpaid volunteer donors [1].

CONCLUSION

The presence of HBbAbs would expose recipients of donations to the risk of transmission of HB. Only a viral DNA assay would confirm the presence or absence of HBV in the blood donor. Mohammad *et al* reported that after finding a 19.8% level of HBbAg in negative HBsAg

blood donors in India in 2011, the HBV DNA assay by PCR showed that 7, 5% of the anti-HBc positive population carried viral DNA, which is therefore contagious. Additional studies on a larger sample should be conducted and the promotion of vaccination should be done to avoid the risk of recipients of blood being infected with hepatitis B.

Conflict of Interest

There was no conflict of interest in the study.

REFERENCES

1. Hépatite B. Organisation Mondiale de la Santé, Aide-mémoire 2017, N°204 disponible sur <https://www.who.int/news-room/fact-sheets/detail/hepatitis-b>
2. Sida MB, Mbangue M, Essola J, Leundji H, Dissongoii J. Sida MB, Mbangue M, Essola J, Leundji H, Dissongoii J. Prevalence of Ac anti-HBc in HBsAg negative blood donors at Douala Laquintinie Hospital. 2015;16(1):1-4.
3. Têko M, Dorkenoo M, Agbenu E, Abudu A, Bonou K, Ameyissa A, Gbeassor M. Seroprevalence des anticorps anti-HBc chez les donneurs de sang de Lome (Togo). Journal de la Recherche Scientifique de l'Université de Lomé. 2016;18(2):187-92.
4. Brouard C, Gautier A, Saboni L, Jestin C, Semaille C, Beltzer N. Connaissances, perceptions et pratiques vis-à-vis de l'hépatite B et C en France métropolitaine en 2010. Bulletin épidémiologique hebdomadaire. 2012;29(30):331-53.
5. Essomba NE, Ngaba GP, Koum DK, Momo L, Coppieters Y. Prévalence du Cytomégalovirus chez les Donneurs de Sang d'un Hôpital de District Urbain à Douala-Cameroun. Health Sciences and Diseases. 2015;16(2): 1-5.
6. Noah DN, Njouom R, Bonny A, Meli J, Sida MB, Pirsou P. HBs antigene prevalence in blood donors and the risk of transfusion of hepatitis b at the central hospital of Yaounde, Cameroon. Open Journal of Gastroenterology. 2011;1(02):23.
7. Japhet MO, Adesina OA, Donbraye E, Adewumi MO. Hepatitis B core IgM antibody (anti-HBcIgM) among hepatitis B surface antigen (HBsAg) negative blood donors in Nigeria. virology journal. 2011;8(1):513.
8. Zampino R, Boemio A, Sagnelli C, Alessio L, Adinolfi LE, Sagnelli E *et al.* Hepatitis B virus burden in developing countries. World journal of gastroenterology. 2015 Nov 14;21(42):11941.
9. Said ZN, El Sayed MH, Salama II, Aboel-Magd EK, Mahmoud MH *et al.* Occult hepatitis B virus infection among Egyptian blood donors. World journal of hepatology. 2013;5(2):64.
10. Asim M, Ali R, Khan LA, Husain SA, Singla R, Kar P. Significance of anti-HBc screening of blood donors and its association with occult hepatitis B virus infection: Implications for blood transfusion. Indian J Med Res;132:312-7.
11. Allain JP, Reeves I, Kitchen AD, Wenham D, Williamson LM. Feasibility and usefulness of an efficient anti-HBc screening programme in blood donors. Transfusion Medicine. 1995;5(4):259-65.
12. Manzini P, Girotto M, Borsotti R, Giachino O, Guaschino R, Lanteri M, Testa D, Ghiazza P, Vacchini M, Danielle F, Pizzi A. Italian blood donors with anti-HBc and occult hepatitis B virus infection. haematologica. 2007;92(12):1664-70.