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Research article Journal of Hepatology, Gallbladder and Biliary Disease Research Open Access

Seroprevalence of Hepatitis C Virus Infection among Blood Donors in General Dipumba Hospital in Mbujimayi, Democratic Republic of Congo

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Received: 16 February, 2018; Accepted: 19 February, 2018; Published: 21 March, 2018

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Abstract

Hepatitis C virus is one of the blood borne transmissible infections of public healthsignificance. It can be transmitted to a wider population through transfusion of contaminatedblood or blood products. The aim of this study was to determine the seroprevalence of HCV antibodies amongst potential blood donors in Dipumba's hospital in Mbujimayi.

Retrospective cross-sectional descriptive study of seroprevalence of hepatitis C were conducted from consented blood donors in the study area and were examined for anti-HCV antibody using HCVSCAN test. Results were analyzed using SPSS version, 23.0 statistical software Package of the 1584 blood donors examined in the study population 1, 9 % (n= 30) were sero-positive to Hepatitis C Virus (HCV), 77.8% were male (sex ratio M/F 3.5 and familial donors were 50.4%. No statistical significant association with the seroprevalence of Hepatitis C Virus and general characteristics of blood donors in Mbujimayi (age, sex, marital status, blood donation category).

Our findings further confirm the presence of hepatitis C virusinfection among blood donors in Mbujimayi. Routine HCV screening of blood donors is therefore recommendedin order to reduce the risk of post transfusion hepatitis C.

Keyword: Seroprevalence; hepatitis C; blood donors; Mbujimayi

Case Presentation

Hepatitis C Virus (HCV), first identified in 1989, is strictly a blood-borne RNA viral infection in the family Flaviviridae. Humans are the only reservoir for this viral infection. Despite that Hepatitis C is one of the most frequent infections associated with blood transfusion; it was the HIV epidemic that alerted general public to the importance of serological tests in blood banks [1].

Hepatitis C infection is a worldwide problem in public health and has becomea significant cause of morbidity and mortality, especially in developing countries. Blood transfusions save millions of lives, but Transfusion Transmitted Infections (TTIs) still put millionsof people at risk and pose a serious problem, especially in multi transfused patients [2, 3].

Hepatitis C Virus (HCV) infection is one of the most challenginghealth problems to face humanity for decades, especiallyin developing countries where the disease remainshighly endemic. HCV is considered to be endemic in the Democratic Republic of the Congo (DRC). It is estimated that HCV affects approximately 647,000 Congolese1 and 130-150million people throughout the world [4].

HCV infection is usually self-limited in the initial stages, but failure of the immune system to clear the virus leads tochronicity. Chronic hepatitis C is often clinically insidious butdevelops progressively and persistently over years or decades. Chronic infection with HCV is a serious public health concernas it is linked to hepatic cirrhosis and hepatocellular carcinoma and can ultimately cause premature death [5, 6, 7].

Hepatitis virus screening is not yetimplemented routinely, and the lack of effective care and treatment programmes make matters worse. Furthermore, the DRC is not currently listed in the HCV synthesis project. Some medical institutions in the DRC fail to perform HCVscreening on donated blood [4, 8].Therefore, patients undergoing blood transfusions are at high risk of HCV infection. Different studies have reported inconsistent prevalencerates of HCV in the DRC. The prevalence of HCV antibodies (anti-HCV) has been estimated to vary from 0.2% to 13.7% [9, 10].Therefore this study was carried out to investigate the seroprevalence of HCV antibodies among blooddonors in the city of MbujiMayiin order to contribute to safe transfusion.

Patient and Method

We performed a retrospective cross-sectional descriptive study of serum hepatitis C markers in blood donors. The study

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was spread over a period of 12 months, from January 1 to December 31, 2016.Our target population is made up of all voluntary, family and remunerated blood donors who have consulted Dipumba General Hospital during 2016. Consisting of 1584 donors, our sampling is exhaustive.

All blood donors were screened foranti-HCV using HCVSCAN test. A recording grid was used to collect the data from the study. We have encoded the data with the Excel software but the analysis was done using the SPSS 23 software. The descriptive analysis was carried out by calculating the proportions for the qualitative variables. The study variables are age, sex, donor categories and HBs serology.

The descriptive analysis was carried out by calculations the proportions for the qualitative variables and the different frequency comparisons were encrypted using the Chi-square test of Pearson and the Fisher test if necessary. We set the statistical significance threshold at $P < 0.05$.

This study was approved by related ethics committee besides and donors 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.

Results

It appears from table 1 that the majority of donors in our study was 20-35 years (60, 2%); 77.8% were male (sex ratio M/F 3.5); and 76, 9% of married. Note that 50.4% of donors were our series family and almost half of the blood donorswere from group O.

Of the 1584 blood donors examined in the study population 1.9 % (n= 30) were sero-positive to Hepatitis C Virus (HCV) while 1554(97.8%) were sero-negative. The confiance limits of this prevalence various from 1.3% to 2.73%.

It is apparent from this table 3, that age, sex, marital status and blood donation category were not statistical significatively associated with the seroprevalence of Hepatitis C Virus.

Discussion

Hepatitis C virus is an important cause of morbidityand mortality. Detection of antibodies to various hepatitis C viral antigens indicates infection with the virus and inmost cases portrays a chronic infection. The course ofthe chronic hepatitis can be prolonged and insidious andinfected persons may not develop symptoms for manyyears after onset of chronic infection [11].

The study showed that more than 77, 8% of the donors are males (Table 1). These results are consistent with the fact finding by Tagny, et al. that one of the common characteristics among blood donors insub-Saharan Africa is the predominance of young adult men [12]. The low proportion of women among blood donors is explainedby many cons-indications for blood donation including amongothers, pregnancy, anemia, menstruation, breastfeeding etc [13].

In this study, 798 (50.4%) blood donors were family donors and 27.6% of paid donors (Table 1). Indeed, several previousstudies worldwide have shown that replacement donors were markably prevalent [15]. At the Provincial Blood Transfusion Center of the Province of Katanga, trends appear to be identical to our results and also those obtained by Noubiap in Cameroon [18]. This indicates that many things must be done to motivate and closer through awareness campaignsvoluntary donors on the importance of blood donation, expect conditions to meet the objectives that WHO is assigned.

Table I: General characteristics of blood donors in Mbujimayi

General characteristics of blood donors	Frequency	Percent
Sex		
Female	352	22.2
male	1232	77.8
Age (years)		
< 20	104	6.6
20-35	954	60.2
> 35	526	33.2
Marital status		
In couple	1218	76.9
single	366	23.1
Blood donation category		
Volunteer	349	22
Familial	798	50.4
Paid	437	27.6
Blood group		
A	445	28.1
AB	145	9.2
B	204	12.9
O	790	49.9

Central Africa is considered as a high-prevalence region of anti-HCV antibodies, detected in about 2–20% of the population [19]. The HCV prevalence in this study was found to be 1.9% (Table 2). This is lower than12.3% as well as 6.3% HCV prevalence rates

Table II: Prevalence rate of Hepatitis C virus in blood donors

Case	Frequency	Percent	95% conf limits
Positive	30	1.9	1.3%-2.73%
negative	1554	97.8	97.3%-98.7%
Total	**1584**	**100**	

reported by Halim and Ajayi as well as Sheyin, et al. respectively [20, 21]. In addition, the prevalence of 1.9% obtainedin this study is also lower than the 8.4% HCV prevalencereported from Abuja by Agwale, et al. Chukwurah, et al. also reported a prevalence of 7.6% amongblood donors in south-eastern State of Nigeria [22, 23]. Ayolabi, et al. reported a sero-prevalence rate of HCV amongblood donors in Lagos, Nigeria to be 8.4%, which is alsohigher than the one observed in the present study. On the other hand, Beatriz, et al. reported a lower1.2% sero-prevalence rate of HCV in the general population of northwestern Tanzania [24, 25]. Different studies have reported inconsistent prevalencerates of HCV in the DRC. The prevalence of HCV antibodies (anti-HCV) has been estimated to vary from 0.2%-13.7% [4].These variations could be due the fact that prevalence of HCVgreatly differs according to the geographical location of apopulation.

Gender-related seroprevalence in this study shows that the prevalence was higher amongst female (2.3%) than among males (1.8%) (Table 3). This is in agreement with the findings of Afolabi et, al. reported a higher prevalence in females than males in Ibadan, South-western Nigeria [26]. However, Vardas, et al. in Namibia, Udeze, et al. in Ibadan and Olokoba et, al. in a study in Yola, North eastern Nigeria reported that males had higher prevalence than females [11, 27, 28].The result obtained in this study reveals that gender did not show any statistical significant association with the seroprevalence of Hepatitis C Virus (P= 0.55). This may be attributed to the fact that both the males and females lived in the same area andare involved in virtually the same activities or shared the same facilities that can predisposedthem to the infection. This implies that genderdifferences cannot be used as a determinant for the transmission of the viral infection in the study area.

Table III. Association between results HCV and general characteristics of blood donors

General characteristics of blood donors	Hepatitis C		OR [IC 95%]	*P*
	Positive	Negative		
Age (years)				
<20	2 (1. 9%)	102(98. 1%)	1.23[0.13-5.44]	0.88
20-35	15 (1. 6%)	939(98. 4%)		
>35	13 (2. 5%)	513(97. 5%)	1.59[0.75-3.36]	0.22
Sex				
Female	8(2. 3%)	344(97. 7%)	0.78 [0.35-1.77]	0.55
male	22(1. 8%)	1210(98. 2%)		
Marital status				
In couple	24(2. 0%)	1194(98. 0%)	0.83 [0.34-2.04]	0.68
single	6(1. 6%)	360(98. 4%)		
Blood donation category				
Familial or Paid	25(2. 0%)	1210(98. 0%)	1.42 [0.53-4.79]	0.66
Volunteer	5(1. 4%)	344(98. 6%)		

Analysis of the age related seroprevalence of HCV antibodies in this study showed that age group > 35 years had the highest prevalence of 2.5 % followed by age group < 20 years which had prevalence of 1.9 % (Table 3). The findings of this study were also in agreement to observations of Ejele, et al. and Ayolabi, et al. who reported highest prevalence of HCV antibodies in the age group 30-39 years, the supposedly sexually active group [29, 30]. There was, however, no statistical association (P = 0.88, P= 0.22) between however, no statistical association (P =0.05) between age of the patients and prevalence of HCV.

Conclusion

At the end of our study, we note that a majority of blood donors were aged between 20-35 years is 60.2%, while 6.6% were aged < 20 years, 77.8% were male, 78.0% were composed of family and paid donors and 22.0% were voluntary donors. The seroprevalence of hepatitis C was around 1.9%. (95% CI: 1.3%-2.73%). No statistical significant association with the seroprevalence of Hepatitis C Virus and general characteristics of blood donors in Mbujimayi.

The seroprevalence of HCV infections is evidentamongst potential blood donors and this call for health care providers and policy makers to ensure that there is proper screening for HCV in all health facilities in the area before any blood transfusion in order to minimize the spread of the infection in the area and the country at large.

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