

Prevalence of Hepatitis C among Blood Donors at the National Blood Transfusion Center of Bamako in Mali

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Abstract

Introduction and purpose of the study: The overall prevalence of HCV among adults in sub-Saharan Africa has increased from 3.82 to 3.94% [3]. We find a disproportionate prevalence of viral hepatitis C in blood donors in several national blood transfusion centers in Sub-Saharan Africa and the aim of our work was to study the seroprevalence of hepatitis C in blood donors from the center national blood transfusion center of Bamako **Methods:** This was a descriptive cross-sectional study that took place at the CNTS national blood transfusion center in Bamako from July to December 2019. Our study concerned blood donors (volunteers and relatives) presenting to the CNTS in Bamako during the study period. It focused on an exhaustive random sample of CNTS blood donors, the variables studied were gender, marital status, type of donor HCV+, HCV-, age and number of donations. Serodiagnosis was determined by the ELISA technique. **Results:** We collected 250 samples, the 26-35 age group was the most represented with 49.6%; the prevalence of hepatitis C was 1%. Hepatitis C marker positivity has been observed in family donors. **Conclusion:** The seroprevalence of hepatitis C during our study was 1%. The ELISA technique with monolisa HCV reagent was used as the method. We found a relationship between seroprevalence and few sociodemographic aspects.

Keywords: HCV+; HCV-; monolisa HCV; ELISA; Sociodemographic

Introduction

Viral hepatitis C is an infectious disease with parenteral and sexual transmission. It is characterized by preponderant damage to the mononuclear phagocyte system and the hepatic parenchyma [1]. Blood transfusion is a therapeutic act but it also exposes recipients to a risk of transmission of infectious agents through blood, despite the progress made in transfusion safety [2]. For a better guarantee of this transfusion safety, the WHO recommends screening for four infectious markers, in particular the acquired immunodeficiency virus (HIV), the hepatitis B and C viruses and antibodies

to treponema pallidum on all donations. of blood. Pathologies due to viral hepatitis constitute a public health problem, whereas blood transfusion is by far the main source of transmission. In developed countries, the seroprevalence of HCV among blood donors is 0.32% compared to 3.96% in developing countries [2]. Overall adult HCV prevalence in sub-Saharan Africa has increased from 3.82 to 3.94% [3]. We find a disproportionate prevalence of viral hepatitis C among blood donors in

several national blood transfusion centers in Sub-Saharan Africa. Thus, in a study conducted in Burkina Faso, by Marius Bolni Nagalo et al, the seroprevalence of the hepatitis C virus is 8.7%; in Cameroon, this seroprevalence was 3.2% among blood donors [4]. In a similar study carried out by A.I. Rakotoniana in Madagascar, this seroprevalence was 1% against 0.2% found by Boushab M et al in Mauritania in 2015 [5]. In MALI, a study on HBV and HCV co-infection was carried out at the CNTS in Bamako in 2005 by Diallo A and enabled us to observe a prevalence of 12.1% of HBV and 2.5% of HCV in donors of blood [1]. More than a decade after Diallo A's study on HCV at the national transfusion center in Bamako, no study has been conducted on the overall prevalence of the viral hepatitis C virus among blood donors.

General objective:

- To study the seroprevalence of hepatitis C in blood donors at the national blood transfusion center in Bamako.

Specific objectives:

- Determine the socio-demographic characteristics of donors;
- Determine the prevalence of hepatitis C in blood donors;
- Determine risk factors for hepatitis C in blood donors.

Method and patients:

Study setting: our study took place at the national blood transfusion center (CNTS) in Bamako, a reference center for the collection and dispensing of blood and related products. The CNTS was created by Ordinance No. 90-38/P-RM of June 5, 1990 and Ordinance 041-P-RM of September 20, 2000 confers on it the status of a public establishment of a scientific, technological

and cultural nature. (EPSTC) and Decree No. 587/P-RM of November 23, 2000 regulates its operation, Type and period of study: This was a descriptive cross-sectional study that took place from July to December 2019. Our study concerned blood donors (voluntary and family) presenting to the CNTS in Bamako during the period of study. Inclusion criteria: were people meeting the criteria for blood donation, aged between 18-60 years, weighing at least 55 kg and who are clinically fit. Donors should also give their free and informed consent. Non-inclusion criteria: unfit blood donors, those who have not given their informed consent to participate in this study as well. Voluntary or family donors who came to the CNTS outside the period concerned were also not included. The sample size was calculated by the formula $n = Z^2PQ/i^2$ which is a precision-based formula. By fixing the precision at 2%, the confidence interval at 95% ($\alpha=5\%$), knowing that the rate was 2.5% according to a survey carried out at the CNTS in 2005 with $P = 0.025$; $Q = 1-P$ therefore $Q = 0.975$; $i = 0.02$; $Z=1.96$; the sample size is = 234. The variables studied were qualitative (gender, marital status, type of HCV+, HCV- donor) and quantitative (age, number of donations). The technique used for screening was the Monalisa Anti-HCV plus version 3 test (Biorad France) presented in the form of a kit containing five 96-well plates; Ref: 72340 and 72341 will be used. It is an immunoenzymatic technique based on the 2-step sandwich principle using virus antigens from the viral core NS3, NS4 and NS5 (fixed on the wells of a polystyrene plate) and a rabbit monoclonal antibody anti -Human IgG coupled to horseradish peroxidase. Data collection was done on Excel and analyzed with R studio software. The statistical test used is chi2 with a significance level. The data collected on the individual survey form was recorded on an Excel file. Data analysis was done with R studio software. The statistical test used is chi 2 with a significance level $p < 0.05$. Results: We collected 250 donors, including 222 men and 28 women residing mainly in urban areas. Family donors were in the majority with 64.8%

Type of donation	Number	Percentage
Family donation	162	64,8
Voluntary donation	88	35,2
Total	250	100

Table II: Distribution of donors according to age group

Age range	Number	Percentage
18-25	71	28,4
26-35	124	49,6
36-45	43	17,2
46-60	12	4,8
Total	250	100

Table II: Distribution of donors according to age group

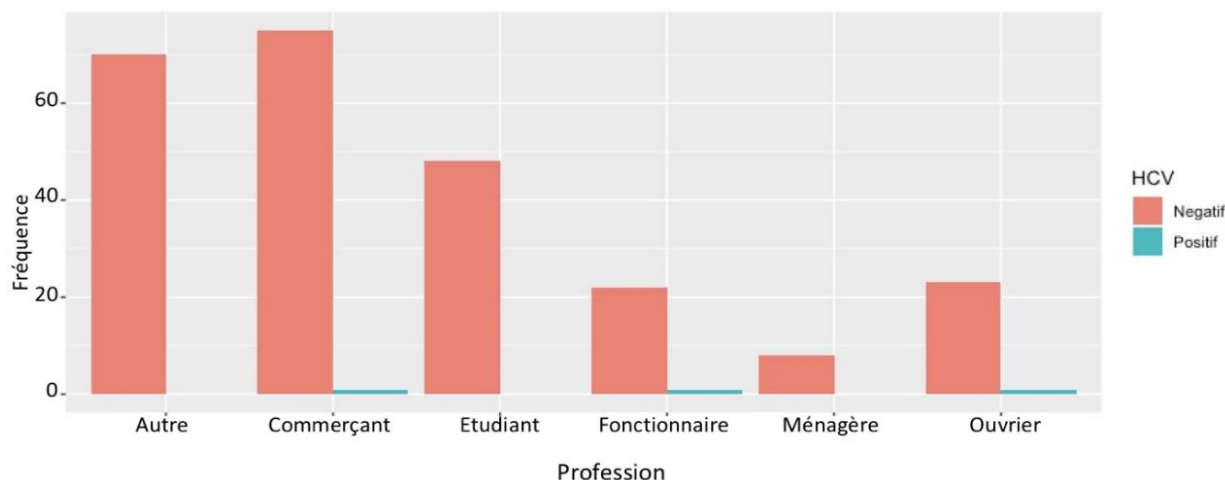


Figure I: Frequency of occupations

The prevalence of hepatitis C was 1%. Hepatitis C marker positivity was observed significantly more in male donors. Hepatitis C marker positivity was observed in married couples.

Discussion:

Sociodemographic characteristics: in our work, men were the most numerous with a frequency of 89% and a sex ratio of 7.92. This result corroborates the data in the literature, in particular the work of Diallo A [1], and that of Goita D et al with a frequency of 94.36% and 82.49% respectively [6]. This predominance of men could be explained by the massive participation of men in blood donation and by the existence of many of its contraindications in women, namely menstruation, gestation, breastfeeding, etc. The most represented age group was 26-35 years old with 49.6%. The results of work by KATILE D et al in Kayes, Goita D. et al in Sikasso corroborate ours and report respectively 36% and 38.40% predominance of the hepatitis C virus in this age range [6,7]. The high participation of this young population is explained by the fact that young people, especially males, have fewer contraindications to blood donation. Merchants constituted the majority of our study population with 30%. They constitute a socio-professional stratum with a high level of income compared to the rest of the population, which allows them to cope very quickly with health expenses and other aspects of patient care and their high proportion could also be explained by the fact that they are also young adults for the most part capable of donating blood.

Analytical data: we reported results comparable to those of Katilé D. et al in Kayes who found a prevalence of 1.40% [7]. We report lower results than those reported by NAGALO et al in Burkina Faso and TONDA Jet al Gabon who respectively found 8.69% and 4.9% [4,8]. Our result is significantly higher than that reported by BOUSHAB MB. et al in Mauritania 0.2% [5]. The difference in prevalence could be explained by the small sample size in our study compared to the studies cited above. In our study, hepatitis C was mainly found in married donors with multiple sexual partners. Polygamy could be a risk factor for the transmission and spread of the hepatitis C virus. Although having a large number of traders, the profession cannot be considered a risk factor for the transmission of Hepatitis C.

Occasional blood donation, as is the case for family donors, unlike voluntary and regular donors, constitutes a risk of transmission of the hepatitis C virus and blood donation is the only opportunity to screen for this virus. If the risk of transmission by blood transfusion in the voluntary donor is almost nil, this is not the case in family donors in whom we report a prevalence of 1.85%. This is why voluntary donors are the preferred category of donors to ensure blood safety [6].

The limitations observed in this study were the small sample size and the lack of confirmation procedures for positive samples.

Conclusion:

The seroprevalence of hepatitis C during our study was 1.2%. The ELISA technique with monolisa HCV reagent was used as the method.

We found a relationship between seroprevalence and certain sociodemographic aspects

Thanks:

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Conflicts of interest:

The authors declare that there is no conflict of interest

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