Portage and Screening for Viral Hepatitis B in Pregnant Women in Kinshasa, Democratic Republic of the Congo

Charlotte L. Tshinguta[1*], Curé M. Tshilenge[1], Louison K. Balowa[1], Berry I. Bongenya[2,3], Simplice K. Makoka[3], Erick N. Kamangu[3,4]

[1]Central Veterinary Laboratory, Kinshasa, Democratic Republic of the Congo
[2]Faculty of Medicine, Technological University Bel Campus, Kinshasa, Democratic Republic of the Congo
[3]"Focus HIV/AIDS" Research Group, Kinshasa, Democratic Republic of the Congo
[4]Service of Molecular Biology, Department of Basic Sciences, Faculty of Medicine, University of Kinshasa, Kinshasa, Democratic Republic of the Congo
Email: *tshinguCharlotte@gmail.com

Abstract

Background: Viral Hepatitis B remains a major public health problem because of its frequency and the costs involved. **Objective:** To determine the carriage and compare the different screening methods for hepatitis B infection in our environment. **Methods:** This work is a descriptive cross-sectional study carried out in collaboration with four health institutions in Kinshasa: the Maternity of Kintambo, the General Hospital of Matété, the General Hospital of Makala and the General Hospital of Kinkole. The choice of centers was made randomly on the basis of women's attendance at the Prenatal Consultation (PNC) and the accessibility of the centers. All women who came to PNC during the period from June 1 to August 30, 2019 in the centers were included in the cohort after signing informed consent. The blood samples were collected by the technical team of the centers and transported in accordance with the cold chain at 4°C to the Laboratory for analysis. Each sample was tested for serological research for HBsAg antigen and ELISA Sandwich at the Central Veterinary Laboratory of Kinshasa. **Results:** 204 consenting women participated in this study. The most represented age group is 19 to 25 years with 95 women (46.6%). 65 women (31.9%) were housewives. 70 women (34.3%) had the primary school education. 79 women (38.7%) were positive for HBV by HBsAg serology while 102 (50%) were positive by ELISA. The most infected age group was 19 to 25 years (42.1% by RDT and 52.6% by ELISA). More cases of infection were found among housewives (49.2% by RDT and 63% by ELISA) compared to other professions. 186 women had tattoos (91.2%) of which 38.7% were positive by HBsAg and 51% by ELISA. On the

other hand, 18 women did not wear a tattoo (8.8%) of which 38.9% were positive by HBsAg and by ELISA. 134 women had a history of blood transfusion (65.7%) of which 41% were positive by HBsAg and 56% by ELISA. On the other hand, 70 women had no history of blood transfusion (34.3%) of which 34.2% were positive by HBsAg and 38.6% by ELISA. **Conclusion:** The study shows that hepatitis B does represent a public health problem among pregnant women in the city of Kinshasa. The seroprevalence of viral hepatitis B in pregnant women remains very high. ELISA appears to be a better technic for the diagnosis of HBV.

Subject Areas

Public Health

Keywords

Viral Hepatitis B, Pregnant Women, Kinshasa

1. Introduction

Hepatitis B Virus (HBV) infection is a major public health problem globally, particularly in Asia and Sub-Saharan Africa (SSA), with the estimated prevalence ranging between 8% and 20% [1]. The World Health Organization (WHO) estimated that in 2015, around 240 million people were chronic carriers of the HBV [2].

Although the modes of transmission are well known (blood and its derivatives, sexual and vertical transmission), mother-to-child transmission is identified as a cause of the high prevalence of HBV infection in Sub-Saharan Africa [3]. In pregnant women who are chronic HBV carriers, several conditions must be considered, such as the burden of infection of the mother on the fetus, the influence of pregnancy on viral replication, the effects of antiviral treatment on the condition of the mother and newborn, as well as the possibility of hepatitis after childbirth [2] [3].

Hence, the objective of this work was to determine the carriage and compare the different screening methods for hepatitis B infection in our environment.

2. Methods

This work is a descriptive cross-sectional study carried out in collaboration with four health institutions in Kinshasa in reason of one center per district. The centers selected for the work were: Kintambo Maternity, Matété General Hospital, Makala General Hospital and Kinkole General Hospital. The choice of centers was made randomly on the basis of women's attendance at the Prenatal Consultation (PNC), the availability of the chosen centers to work and their accessibility.

All women, without age discrimination, who came for PNC during the period from June 1 to August 30, 2019 in the selected centers were included in the work

exhaustively after signing an informed consent; for those younger than 18 years, a consent from the tutor or parent was required. The blood samples were collected by the technical team of the centers and transported in accordance with the cold chain at 4°C to the Laboratory for analysis.

Each sample was tested for serological research for HBsAg antigen and ELISA Sandwich at the Central Veterinary Laboratory of Kinshasa. Sociodemographic information and other parameters were collected in the previously tested survey sheets.

3. Results

Two hundred and four (204) consenting women participated in this study. The most represented age group is that of 19 to 25 years with 95 women (46.6%), followed by that of 26 to 35 years with 85 women (41.7%) and that of 15 to 18 years with 24 women (11.7%). Sixty-five (65) women (31.9%) were Housewives, followed by Independent Saleswomen (27.9%), Professional Sex Workers (21.6%) and Health Professionals (18.6%). Seventy (70) women (34.3%) had a Primary Education level, followed by Illiterates (31.7%), University level (17.6%) and Baccalaureate level (16.2%). Table 1 presents the previous data.

Seventy-nine (79) women (38.7%) were positive for HBV by HBsAg serology while 102 (50%) were positive by ELISA. The most infected age group was 19 to 25 years (42.1% by RDT and 52.6% by ELISA). More cases of infection were found among housewives (49.2% by RDT and 63% by ELISA) compared to other professions. Table 2 presents the data mentioned above. Table 3 presents the screening results by occupations and study levels.

Table 1. Sociodemographic parameters of patients.

Characteristics	Frequencies
Age group	
15 - 18	24 (11.7%)
19 - 25	95 (46.6%)
26 - 35	85 (41.7%)
Occupations	
Household	65 (31.9%)
Independent saleswoman	57 (27.9%)
Health professional	38 (18.6%)
Professional sex worker	44 (21.6%)
Level of education/schooling	
Illiterate	65 (31.9%)
Primary level	70 (34.3%)
State diploma/baccalaureate	33 (16.2%)
University level	36 (17.6%)

Table 2. Results of diagnostics.

Characteristics	Frequencies	
	Results AgHBs	Results ELISA
15 - 18	4 (16.6%)	12 (50.0%)
19 - 25	40 (42.1%)	50 (52.6%)
26 - 35	35 (41.0%)	40 (47.0%)
Total	79 (38.7%)	102 (50%)

Table 3. Breakdown of results by occupation and level of study.

Characteristics	Frequencies		
	N	Results AgHBs	Results ELISA
Occupation			
Household	65	32 (49.2%)	41 (63.0%)
Independent saleswoman	57	21 (36.8%)	24 (42.1%)
Health professional	38	12 (31.5%)	18 (47.3%)
Professional sex worker	44	14 (31.8%)	19 (43.1%)
Level of education/schooling			
Illiterate	65	24 (37.0%)	24 (37.0%)
Primary level	70	29 (41.4%)	49 (70.0%)
State diploma/baccalaureate	33	17 (51.5%)	17 (51.5%)
University level	36	9 (25.0%)	15 (41.7%)

One hundred and eighty-six (186) women had tattoos (91.2%) of which 38.7% were positive by HBsAg and 51% by ELISA. On the other hand, 18 women did not wear a tattoo (8.8%), of which 38.9% were positive by HBsAg and by ELISA. One hundred and thirty-four (134) women had a history of blood transfusion (65.7%) of which 41% were positive by HBsAg and 56% by ELISA. On the other hand, 70 women had no history of blood transfusion (34.3%) of which 34.2% were positive by HBsAg and 38.6% by ELISA. Table 4 presents these data.

4. Discussion

The objective of this study was to determine the carriage and compare the different methods of screening for the HBV infection in our environment. Two hundred and four (204) consenting women participated in this work, which took place in four health institutions in Kinshasa: Kintambo Maternity, Matété General Hospital, Makala General Hospital and Kinkole General Hospital.

The most represented age group in this population of women consulting for PNC is that of 19 to 25 years with 95 women (46.6%), followed by that of 26 to 35 years with 85 women (41.7%) and that of 15 to 18 years with 24 women (11.7%). These data are similar to those of the various studies published in our community which present the age group of 20 to 30 years as being the most prevalent for sexually transmitted infection including HBV [4] [5] [6].

Table 4. Associated factors.

Characteristics		Frequencies		
		N	Results AgHBs	Results ELISA
Tattoos	YES	186	38.7%	52.6%
	NO	18	38.9%	38.9%
History of blood transfusion	YES	134	41.0%	56.0%
	NO	70	34.2%	38.6%

About a third of the population (65 women, 31.9%) is Housewives, followed by Independent saleswomen (27.9%), Professional Sex Workers (21.6%) and Health Professionals (18.6%). About a third of the women included (70 women, 34.3%) had a Primary Education level, followed by Illiterates (31.7%), University level (17.6%) and Baccalaureate level (16.2%). The class of housewives is the most represented in most studies related to PNC and pregnancy in our community [4] [7] [8]. This is also correlated with the level of education among pregnant women which is generally low in our environment [4] [7] [8].

About a third of the screened population (79 women, 38.7%) were positive for HBV by HBsAg serology while 102 (50%) were positive by ELISA. These data are explained by the sensitivity and specificity of the ELISA compared to Rapid Screening Tests.

The age group most infected with the HBV was 19 to 25 years (42.1% by RDT and 52.6% by ELISA). This age group is presented as the most sexually active age group in different societies and the one looking for a new sexual experience; hence a form of sexual promiscuity [3].

More cases of infection were found among Housewives (49.2% by RDT and 63% by ELISA) compared to other professions. One hundred and eighty-six (186) women had tattoos (91.2%) of which 38.7% were positive by HBsAg and 51% by ELISA. On the other hand, 18 women did not wear a tattoo (8.8%), of which 38.9% were positive by HBsAg and by ELISA.

One hundred and thirty-four (134) women had a history of blood transfusion (65.7%) of which 41% were positive by HBsAg and 56% by ELISA. On the other hand, 70 women had no history of blood transfusion (34.3%) of which 34.2% were positive by HBsAg and 38.6% by ELISA. Several studies have shown that these factors are often associated as a gateway for sexually transmitted infections in our environment [3].

5. Conclusion

This study determined the prevalence of hepatitis B virus as well as the accuracy of the ELISA diagnostic test compared to rapid screening tests. Out of a total of total of 204 pregnant women included, 79 and 102 tested positive for HBsAg and ELISA respectively, giving a prevalence of 38.7% and 50% respectively. This prevalence is very high, thus calling into question this major neglected public

health problem that HBV presents in our environment. These results also confirm that ELISA is a much better method for the diagnosis of HBV.

Conflicts of Interest

The authors declare no conflicts of interest.

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