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Midwives's Knowledge and Practice in Preventing Mother-to-Child Transmission on Hepatitis B Virus in Brazzaville in 2023

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Abstract

Background: Maternal-fetal transmission is the most frequent mode of hepatitis B virus (HBV) contamination in Africa. Prevention of mother-to-child transmission (PMTCT) of hepatitis B is still poorly understood, and training of the health workers involved, such as midwives, is rare. **Objective:** The aim of this study was to assess the knowledge and practices of midwives prevention of HBV' mother-to-child transmission (PMTCT) in Brazzaville. **Patients and Methods:** This was a cross-sectional analytical study conducted in Brazzaville from June 1 to July 31, 2023. Midwives present at the time of the survey in the various Brazzaville health centers visited and who agreed to answer the questionnaire during a face-to-face interview with the investigator were included. Univariate analyses were performed using epi info7.2 software. Pearson's chi-square and Student's t-tests were used to compare proportions and means, which were significant at the 0.05 level. **Results:** At the end of our study, 93 midwives out of 127 agreed to take part in the study, *i.e.* a participation rate of 73.2%. Their median age was of 41.7 years, a median professional experience of 13.7 years, and they worked mainly in primary health care facilities. Global knowledge of HBV PMTCT was satisfactory in 51 (54.3%) midwives. Knowledge of the HBV vaccine was significantly related to professional experience ($p = 0.0167$). PMTCT practice was poor in 48 (51.6%) cases. Overall, the practice of PMTCT was statistically associated with the midwives' place of practice ($p = 0.0262$). **Conclusion:** Midwives had good knowledge but insufficient practice of PMTCT in Brazzaville. Training and awareness-

raising are needed to reduce mother-to-child transmission of HBV.

Keywords

Viral Hepatitis B, Midwifery, Knowledge and Practice

1. Introduction

Viral hepatitis is inflammation of the liver parenchyma caused by the presence of a virus. Of the five hepatotropic viruses involved, viruses B and C account for the greatest burden of morbidity and mortality, making it a major global public health problem. In 2017, more than 2 billion people were infected with the hepatitis B virus in their lifetime, representing around 30% of the world's population, of whom 257 million are chronic carriers [1]. Sub-Saharan Africa and Southeast Asia are regions of high HBV prevalence, with carriage ranging from 8% to 20%. In the Congo, studies estimate the prevalence of hepatitis B at around 5% - 15% [2] [3] [4]. The worldwide prevalence of hepatitis B among pregnant women is between 7.2 and 10.6%, compared with 7.8% in the Congo [5] [6]. Maternal-fetal contamination with the hepatitis B virus is the most common mode of infection in high-prevalence areas, accounting for around 38.9% of cases during pregnancy, 95% during childbirth, and 24% during breastfeeding [7] [8]. Some factors, such as a gestational HBV viral load in excess of 2000 IU/ml, absence of HBV vaccination in the newborn, and HIV co-infection, favor maternal-fetal contamination [9] [10]. Children born to HBsAg-positive mothers and contaminated at birth will develop chronic hepatitis in 90% of cases and die of cirrhosis and/or hepatocellular carcinoma in 25% of cases. Unlike HIV, prevention of mother-to-child transmission (PMTCT) of hepatitis B is still poorly understood, and training of the health workers involved, such as midwives, is rare. In fact, the implementation of a PMTCT strategy for hepatitis B is one of the WHO's guidelines for reducing the burden of hepatitis B worldwide [1]. The aim of this study was to evaluate the knowledge and practices of FHs on the prevention of mother-to-child transmission (PMTCT) of HBV in Brazzaville.

2. Patients and Methods

We conducted a cross-sectional analytical study in Brazzaville's public health centers from June 1 to July 31, 2023, a period of two months. We included primary health centers, secondary health centers or referral hospitals, and tertiary health centers such as general and university hospitals. Midwives present in the various health centers at the time of the survey and who agreed to answer the questionnaire were included. Midwives who subsequently withdrew their consent were excluded. After explaining the purpose of the study and ensuring their anonymity, the midwives were interviewed face-to-face by two trained interviewers. Data were collected using a pre-established questionnaire, designed on

the basis of a literature review and containing 39 items. The performance of the self-administered questionnaire was evaluated by two expert hepato-gastroenterologists with the aim of covering all areas of prevention of mother-to-child transmission of HBV. Midwives' socio-demographic characteristics (age, professional experience, health center of practice and sector of activity), their knowledge, and practice in terms of prevention of mother-to-child transmission were collected. The level of knowledge and practice could be unsatisfactory (less than 50% correct answers) or satisfactory (at least 50% correct answers). Data were entered into Microsoft Excel. Univariate and bivariate analyses were performed on epi info7.5. Chi-square, Fisher, and Student's t-tests were used to compare percentages and means at a significance level of 5%.

3. Results

During the study, 93 midwives took part out of the 127 approached, the participation rate was 73.2%. The median age was 41.7 years (IQR: 31.7 - 49 years). Figure 1 shows the distribution of midwives according to age. The level of education was divided into three classes: primary, secondary and higher education in 21 (22.6%), 40 (43%) and 32 (34.4%) cases. Median professional experience was 13.7 years (IQR: 5 - 18.2). Midwives with at least 10 years' professional experience accounted for 55 cases (59.1%) versus 38 (40.9%). They were interviewed in primary, secondary and tertiary health centers respectively in 47 (50.5%) cases, 29 (31.2%) cases and 17 (18.3%) cases. They practiced in different sectors of activity: prenatal consultation, delivery room and hospitalization sector in 39 (41.9%), 38 (40.9%) and 16 cases (17.2%). Midwives' general knowledge of HBV PMTCT was good in 51 (54.8%) cases and poor in 42 (45.2%) cases. Eighty-six midwives (92.5%) knew about viral hepatitis B, compared with seven midwives (7.5%). Maternal-fetal transmission of HBV was a known mode of hepatitis B infection for 36 (38.7%) participants, compared with 57 (61.3%). The strategy for preventing mother-to-child transmission of HBV was known by 33 (35.5%)

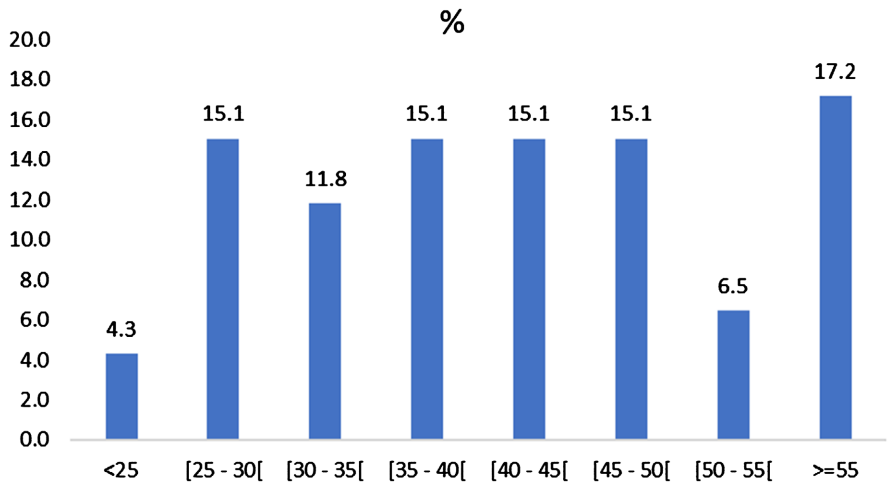

Figure 1. Distribution of midwives by age.

midwives. Concerning the tests performed during the course of viral hepatitis B, only 31 (33.3%) and 33 (35.5%) of the midwives knew the HBsAg and HBV viral load. The molecules used in the treatment of viral hepatitis B were known by 21 (22.6%) midwives. However, only 38 (40.9%) of them were aware of the recommendation to vaccinate newborns at birth. Figure 2 illustrates midwives' responses on the timeframe for vaccinating newborns. General knowledge of PMTCT was not statistically related to professional experience (p = 0.4738), place of practice (p = 0.364) or area of activity (p = 0.5867), midwides education' level (p = 0.129) as showed in the Table 1. However, in details knowledge of HBV vaccine was significantly related to professional experience (p = 0.0167). PMTCT practice was generally good in 45 (48.4%) cases and poor in 48 (51.6%). In fact, HBsAg was systematically requested in 17 cases (18.3%),

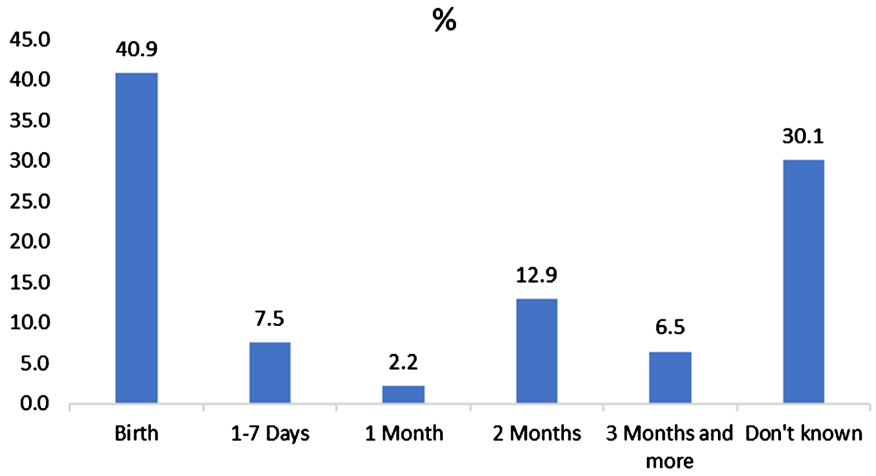

Figure 2. Knowledge of the vaccination deadline for newborns.

Table 1. Bivariate analysis of knowledge and socio-demographic factors.

Independent variable		Knowledge		*p*
		Good	Poor	
Experience ≥ 10 years	Yes	30	25	0.4738
	No	21	17	
Health center	First level	24	23	0.3640
	Second level	19	10	
	Third level	8	9	
Activity's sector	Prenatal consultation	23	16	0.5867
	Delivery	21	17	
	Hospitalization	7	9	
Education level	Primary	9	12	0.129
	Secondary	20	20	
	Higher	22	10	

intermittently in 26 cases (27.9%) and never in 50 cases (53.7%). Among the 43 FHs who performed HBV screening during pregnancy, the test was performed in the first trimester in 34 (36.6%) cases, and in the second trimester in nine (9.7%) cases. No HBV screening was performed in the third trimester of pregnancy. Only 20 (21.5%) midwives advised newborns to be vaccinated against HBV, compared with 73 (78.5%). Nineteen (20.4%) midwives systematically prohibited breast-feeding if the mother was HBsAg-positive 74 (79.6%). Overall, PMTCT practice was statistically linked to the health center where midwives practiced (p = 0.0262), but not to professional experience (0.2725), sector of activity (p = 0.2) or their education' level (p = 0.5398) as showed in the Table 2.

4. Discussion

Many studies have examined the role of midwives in preventing HBV transmission in newborns. The determinants of this prevention have been approached from different angles by the authors. Midwives' experience in terms of length of practice was a determinant of their knowledge of HBV PMTCT in South Sudan. Midwives with more than 10 years' professional experience were in the majority, accounting for 80% of the sample [11]. As for the sector of activity, Bagny *et al.* in Ivory Cost found similar results, with 44.6% of midwives working in delivery rooms [12]. This may be explained by the fact that midwives in antenatal clinics and delivery rooms have had experience in PMTCT of HIV in pregnant women since 2010, and were more available to participate in these studies. Overall knowledge of PMTCT varies from study to study [13]. The overall level of knowledge of PMTCT varied from study to study. It was good for 58% of midwives according to Mursy *et al.*, poor for Elsheik and Adebamowo at 30.9 and 30% respectively [11] [14] [15]. Factors that could explain this variation were the

Table 2. Bivariate analysis of practice and socio-demographic factors.

Independent variable		Practice		*p*
		Good	Poor	
Experience ≥ 10 years	Yes	25	30	0.2527
	No	20	18	
Health center	Primary level	18	29	0.0262
	Secondary level	14	15	
	Tertiary level	13	4	
Activity's sector	Prenatal consultation	17	22	0.2
	Delivery	17	21	
	Hospitalization	11	5	
Education level	Primary	12	9	0.5398
	Secondary	17	23	
	Higher	16	16	

low level of education and the young age of the participants for Elsheik *et al.* in South Sudan [11]. Level of education was not a factor determining overall knowledge in our study. In Ghana, training was the only factor predicting midwives' overall knowledge [16]. More specifically, awareness of HBsAg screening for hepatitis B was highest for Bagny *et al.* in Ivory Cost, and Adjei *et al.* in Ghana, at 59% and 79% respectively. On the other hand, for Bathaix *et al.*, 60.6% of midwives were unaware of the screening test, and 27% were unaware of the time required to perform the test, depending on the term of pregnancy. However, according to WHO recommendations, screening for hepatitis B during pregnancy is indicated in the third trimester, using HBsAg testing, supplemented by viral load testing in the event of HBsAg positivity [17] [18]. Some authors recommend second-trimester screening [12]. HBV screening during the third trimester of pregnancy is followed by antiviral prophylaxis for pregnant women with a high viral load, and sero-vaccination for newborns. However, in Africa, anti-HBV serotherapy is often unavailable, and early treatment could minimize the risk of contamination. Generally speaking, midwives have a poor knowledge of the HBV vaccine [12] [19]. These results reinforce the need to increase midwife training on HBV PMTCT, as suggested by Sahiner *et al.* in Turkey, where the need for training was expressed by 53.5% of midwives [19]. As for the overall practice of PMTCT, Adjei *et al.* in Ghana found 42.9% good practice while Mursy and Elsheik in South Sudan found respectively 60.6% and 76.4% of midwifes with good practice of PMTCT [11] [14] [16]. Bagny *et al.* in Ivory Cost and Adjei *et al.* in Ghana reported a statistical link between PMTCT practice and sector of activity and health facilities [12] [16]. HBsAg practice of pregnant women was carried out by 52.4% of midwives in Ghana, 79% in Canada, where the study included midwives, family doctors and obstetricians, which could explain the relatively higher frequency of HBV PMTCT. Also in Canada, only 23.9% of healthcare professionals participating in the study indicated that viral load was recommended when considering antiviral treatment, and 90.1% indicated a schedule for serological monitoring of infants [16] [20]. Vaccination practice by midwives varied. In Sahiner's study in Turkey, 69.5% of midwives practiced HBV vaccination and 60.1% practiced immunoglobulin injection. In this study, the midwives had previously received training in newborn vaccines, demonstrating the importance of midwife training as a determinant of newborn vaccination. The practice of vaccinating newborns within 12 hours of birth was 37% in Canada, 47.7% in Ivory Cost in 2015 [12] [19] [20]. Low vaccination rates among newborns are as common in resource-poor countries as they are in developed ones, which is why we need to focus on training healthcare professionals who care for pregnant women and newborns. According to Adjei *et al.* in Ghana, the factors limiting the vaccination of newborns from birth were: the mother's denial of her seropositivity, the mother's ignorance of the consequences of hepatitis B for the newborn, the costs associated with monovalent vaccines [21]. Finally, the sample size of our study may have been a limitation.

The reluctance and fear of stigmatization of midwives, despite the anonymity of the study, partly explain the size of the sample.

5. Conclusion

Midwives play an important role in HBV PMTCT, but their practice is poor in terms of screening pregnant women for HBsAg and systematically vaccinating newborns against HBV within the first 24 hours of birth. Efforts need to be made to strengthen their general knowledge and improve their practice of HBV PMTCT, notably through training.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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