



The Outcome of People Screened For Hepatitis B, in a Community-Based Setting in Ouagadougou, Burkina, 2018-2020

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Abstract

Introduction: The fight against hepatitis B in Africa requires knowledge of the epidemiology of the disease in community setting and, above all, patient follow-up. Our objective was to study the outcome of patients after screening for hepatitis B in a community-based setting in Ouagadougou in July 2018.

Methods: We conducted a descriptive cohort study of 787 people screened, sensitized and followed up for 18 months to describe their outcome after screening. Proportions were calculated.

Results: The prevalence of hepatitis B was 11.94%. At 6 months, only 2 patients were cured; only 54.02% were followed up, of which 14.89% were under treatment. At 12 months, 28.74% of patients followed up had stopped the follow-up; two patients had progressed to liver cirrhosis. At 18 months, only 18.09% of patients had benefited from regular follow-up since screening; and 73.59% of those who tested negative had been vaccinated. The reasons for stopping or not seeking follow-up were financial constraints and not finding the need for follow-up.

Conclusion: The high vaccination coverage after the screening campaign was the main interest of the screening campaign in the prevention of hepatitis B. However, the high proportion of patients not followed up and the reasons given forward revealed that despite the severity of hepatitis B, it remains neglected, hence, the importance of having strong health policies to remove the obstacles linked to the lack of follow-up in order to avoid the progression towards complications but also the spread of the disease.

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Introduction

Hepatitis B is a contagious viral disease caused by the Hepatitis B virus (HBV) which causes inflammation of the liver. This condition is a real public health problem [1-3]. Indeed, the seriousness of this condition lies in the fact that 30% of cirrhosis and 53% of primary liver cancers in the world are due to viral hepatitis B [4]. It is the leading cause of hepatocellular carcinoma [5] and the tenth leading cause of death. Fifty to one hundred times more contagious than Human Immunodeficiency Virus (HIV) infection, this pathology also presents a high co-infection with HIV with regard to their modes of transmission which are almost similar: vertical transmission (mother-to-child), blood-borne transmission (blood transfusion, exchange of contaminated objects), and transmission through unprotected sex [6,7].

It is estimated that two billion people are infected with HBV, 277 million are chronic carriers of the hepatitis B virus and that 887,000 died in 2015, an increase of 22% between 2000 and 2014 [8,9]. Almost 600,000 cases of death per year are linked to hepatitis B.

There are 3 areas of prevalence of viral hepatitis: low endemic zone (Northern and Western Europe, North and South America, New Zealand, Japan, Australia with 2 to 4.99%), intermediate endemic zone (Latin America, Central America, Eastern Europe, India, Middle East, Central Asia, Mediterranean countries and North Africa with 5 to 7.99%), highly endemic area (sub-Saharan Africa, China, South Asia East, Amazon basin with a rate \geq 8%). Sub-Saharan Africa is part of the highly endemic area with a prevalence of 2.49 to 19% for hepatitis B. West Africa has a prevalence of 7.26 to 17.55%. [2,10-13]. Despite the mobilization of the international community, this disease remains little taken into account in the national health systems and poorly understood by the populations because awareness campaigns are rare. In Côte d'Ivoire for example, the prevalence of hepatitis B is 9.4% [12]. In Burkina Faso, the National Agency for Research on AIDS and Hepatitis estimated over the period from 2014 to 2015 a national prevalence of hepatitis B at 9.1% [14]. It is responsible for 1,100 deaths each year in the Burkinabè population [15].

Efforts have been made in the fight against the disease in Burkina Faso, in particular the systematic screening of pregnant women, the subsidy of tenofovir, the development of a national program to fight against hepatitis B and the introduction of vaccination in the expanded immunization program in 2006 [16]. All of these measures are aimed to reduce the incidence and mortality associated with hepatitis B [17]. Despite the introduction of all these beneficial measures, enormous challenges remain. Indeed, the follow-up of patients is facing a lot of difficulties. There is no universal health coverage and the Para clinical examinations that accompany the follow-up are often expensive. All these factors contribute to irregular follow-up of patients with hepatitis B patients, while prevention and early detection of complications are linked to an optimal early follow-up [18].

There are very few studies on the outcome of patients with Hepatitis B Virus Surface Antigen (HBsAg). A study conducted in Saudi Arabia showed that 69% of the reasons for loss to follow-up were ignorance of the existence of the appointment [19]; another study in Ghana mentioned the lack of financial means as a major obstacle to follow-up [20]. The scourge of hepatitis is becoming a greater concern than HIV / AIDS and we are currently witnessing an "epidemic" of complications from hepatitis

B virus infection, namely liver cirrhosis and hepatocellular carcinoma. Known or unknown infected people live in the population, and more often than not, consult health facilities only at the advanced stage of the disease.

The fight against hepatitis B in Africa requires knowledge of the epidemiology of the disease in community-based settings and especially knowledge of the outcome of patients after diagnosis in order to make possible targeted actions to prevent infection or the inevitable death after complications in African countries.

In Burkina Faso, there is insufficient data on the outcome of screened patients, making it necessary to carry out new studies to help guide policies for the effective care of people affected by this scourge.

Our study therefore proposes to describe the outcome of people screened for hepatitis B, during the screening campaign in Ouagadougou, by the association *SOS Hépatites Burkina* in order to strengthen the health system in the fight against hepatitis B.

Methods

Type and period of study

This was a cohort study including people serologically screened for viral hepatitis B by the *SOS Hépatites Burkina* association. The follow-up covered the period from July 2018 to January 2020, i.e., a period of 18 months.

Study population and non-inclusion criteria

It was about people of all ages and sexes screened by the *SOS Hépatites Burkina* association, during the community-based screening campaign, in July 2018, in Ouagadougou.

In this study, we included people who were screened by the *SOS Hépatites Burkina* association and who agreed to participate in the study, HBsAg-positive patients having given their consent for the follow-up. Parental consent was obtained for children under the age of 18.

Sampling

The screening campaign took place in the city of Ouagadougou in different districts and on different dates in July 2018. All people who came for screening at these sites and who agreed to participate in the study were exhaustively included.

Data collection

We collected data on socio-demographic characteristics (age, which was subsequently categorized as age group, sex, occupation, marital status), lifestyle, risk factors, personal and family history (alcohol intake, smoking, blood transfusion, circumcision, excision, tattoos, scarification, previous screening for hepatitis B, hepatitis B vaccination, jaundice, family history, history of HIV screening, history of HIV) through a questionnaire that was administered to participants, on the day of their screening, just before they were screened. After screening, results were reported either to the participants themselves (interview) or to the results register of the *SOS Hépatites Burkina* association, using the participant code (documentary review). Awareness of the seriousness of the disease, information on prevention methods and the need for medical follow-up were given. For the rest of the collection, the participants were divided into two (2) groups: the group of HBsAg negative participants and the

group of HBsAg positive participants. A questionnaire adapted to each group was administered individually, by telephone call, to collect information on their follow-up at 6 months, 12 months and 18 months. Data collected during the follow-up for the HBsAg positive participants were follow-up status, the reasons for the absence of follow-up or discontinuation of follow-up, clinical and therapeutic evolution. Vaccination of the participant or family members after screening was collected for both HBsAg-negative and HBsAg-positive participants. If the participant could not be reached, the investigator repeated the call on the following days until news on his/her future was obtained.

Data management and statistical analysis

The data collected on the collection sheets developed (the questionnaire) for this study were entered on a microcomputer, using the Epi Data software. Subjects lost to follow-up with missing data were excluded from the study.

First, we performed the descriptive analysis of the socio-demographic characteristics, lifestyle, risk factors, personal and family history of all study participants. We calculated proportions and means for qualitative and quantitative variables respectively. Then, the overall prevalence of hepatitis B and the prevalence of hepatitis B according to the socio-demographic characteristics, background and lifestyle were calculated. In addition, a descriptive analysis of the vaccination coverage of HBsAg-negative participants through the calculation of its proportion was carried out. Finally, a descriptive analysis at 6, 12 and 18 months of follow-up, estimated the proportions of subjects according to their upcoming, the reasons for not following-up and / or stopping the follow-up, the various clinical and therapeutic evolutions of HBsAg-positive participants. Proportions were tested using the chi-square test.

Table 1: Socio-demographic characteristics of people screened for hepatitis B in community settings in Ouagadougou in July 2018.

| Characteristics | Frequency | Percentage (%) | P |
|-----------------------|-----------|----------------|--------|
| Age groups | | | <0.001 |
| ≤ 20 years | 177 | 22.49 | |
| [20-30] | 225 | 28.59 | |
| [30-40] | 201 | 25.54 | |
| [40-50] | 99 | 12.58 | |
| > 50 years | 85 | 10.80 | |
| Sex | | | 0.09 |
| Male | 370 | 47.01 | |
| Feminine | 417 | 52.99 | |
| Profession | | | <0.001 |
| Student | 290 | 36.85 | |
| Employee | 283 | 35.96 | |
| Informal sector | 70 | 8.89 | |
| Housewife | 55 | 6.99 | |
| Retired | 44 | 5.59 | |
| Unemployed | 22 | 2.79 | |
| Pre-schooled | 21 | 2.66 | |
| Farmer | 2 | 0.25 | |
| Marital status | | | <0.001 |
| Single | 377 | 47.90 | |
| In a relationship | 371 | 47.14 | |
| Single with child | 39 | 4.96 | |

Results

Socio-demographic characteristics of people screened for hepatitis B in community-based settings in Ouagadougou in July 2018

Of 787 people included in this study, the average age in our series was 30.94 years with extremes of 1 and 74 years. Females represented 53.00% (n = 417), a sex ratio of 0.89. The unemployed accounted for 55.15% (n = 434) (Table 1). The most represented profession was students 36.85% followed by employees 35.96%. Health workers were 5 or 1.76% of the employees. Single people without children represented 47.90% and people living in couples 47.14%.

Table 2: 6-month's outcome of people screened for positive HBsAg during in a community-based setting in Ouagadougou, in July 2018.

| 6-months follow-up | Frequency | Percentage (%) | P |
|----------------------------------|-----------|----------------|--------|
| Follow-up | | | 0.007 |
| Yes | 56 | 64.37 | |
| No | 31 | 35.63 | |
| Patient followed up | | | 0.45 |
| Yes | 47 | 54.02 | |
| No | 40 | 45.98 | |
| Reasons for non-follow-up | | | <0.001 |
| Does not find a need | 22 | 55.00 | |
| Lack of financial means | 11 | 27.50 | |
| Unaware of follow up | 4 | 10.00 | |
| Lack of qualified personnel | 3 | 7.50 | |
| Processing | | | <0.001 |
| Yes | 7 | 14.89 | |
| No indication | 40 | 85.11 | |
| Family screening | | | <0.001 |
| Yes | 63 | 72.41 | |
| No | 24 | 27.59 | |
| Outcome | | | <0.001 |
| Chronic carrier | 44 | 93.62 | |
| Healed | 2 | 4.25 | |
| Liver cirrhosis | 1 | 2.13 | |
| Death | 0 | 0.00 | |

18 months fate of people screened for HBsAg positive in a community-based setting in Ouagadougou in July 2018

A total of 94 out of 787 patients were HBsAg positive, i.e., a prevalence of 11.94%; 88.06% of participants tested negative (n = 693). Of these, 73.59% were vaccinated (received at least one dose), after screening.

During follow-up, of the 94 HBsAg positive patients, 7 patients were lost to follow-up. We were unable to obtain data on their fate, so the analysis focused on 87 patients.

After 6-month follow-up of the 87 HBsAg carriers, only 54.02% (47) of the patients had medical follow-up (p = 0.45). The analysis shows that the reasons for not seeking medical follow-up at six (6) months were that 55% of carriers thought that medical follow-up was not necessary for them, while the lack of financial means represented 27.50 % of reasons for not

seeking medical follow-up ($p < 0.001$). During the 6th month follow-up, seven (07) patients or 14.89% required an indication for treatment. It was a long-term treatment in 100% of cases and the treatment consisted of tenofovir 300 mg once a day, in all patients. All patients honored the treatment, and their source of funding was personal and/or family and/or NGO in respectively, 42.86% ($n = 3$), 28.57% ($n = 2$) and 28.57% ($n = 2$) cases. Two patients were cured by the 6th month. However, 44 patients (93.62%) out of 47 reviewed, had not eliminated HBV, thus defining chronic carriage. One (01) case of liver cirrhosis was found. No case of death was recorded in the 6th month ($p < 0.001$) (Table 2).

Table 3: 12-month's outcome of people screened for positive HBsAg during in a community-based setting in Ouagadougou in July 2018.

| 12-month follow-up | Frequency | Percentage (%) | P |
|---|-----------|----------------|-------------|
| Follow-up since screening | | | $P < 0.001$ |
| Yes | 63 | 72.41 | |
| No | 24 | 27.58 | |
| Patient followed up | | | $P = 0.58$ |
| Yes | 29 | 33.33 | |
| No | 33 | 37.93 | |
| Stopped | 25 | 28.74 | |
| Reasons for non-follow-up | | | $P < 0.001$ |
| Don't find a need | 19 | 57.58 | |
| Lack of financial means | 9 | 27.27 | |
| Ignore the existence of follow-up | 3 | 9.09 | |
| Lack of qualified personnel in place of residence | 2 | 6.06 | |
| Reasons for discontinuing follow-up | | | $P = 0.08$ |
| Lack of financial means | 11 | 44.00 | |
| Lack of qualified personnel | 7 | 28.00 | |
| Does not find a need | 5 | 20.00 | |
| Healed | 2 | 8.00 | |
| Family screening | | | $P < 0.001$ |
| During the first 6 months | 63 | 72.41 | |
| No | 15 | 17.24 | |
| After 6 months | 9 | 10.34 | |
| Treatment (patients followed up) | | | $P = 0.02$ |
| Yes | 8 | 27.58 | |
| No indication | 21 | 72.41 | |
| Outcome (patients followed up) | | | $P < 0.001$ |
| Chronic carrier | 26 | 89.65 | |
| Healed | 1 | 3.44 | |
| Liver cirrhosis | 2 | 6.90 | |
| Death | 0 | 0.00 | |

At 12 months of follow-up, out of the 87 patients, 29 were under medical follow-up (old and new) ($p = 0.58$). The reasons for not following up medically at 12 months was that 57.58% of carriers thought that medical follow-up was not necessary for them, while the lack of financial means represented 27.27% of the reasons for not seeking follow-up ($p < 0.001$) and 44.00% of the reasons for discontinuing follow-up at twelve (12) months.

During the 12th month follow-up, eight (08) patients or 27.58% required an indication for treatment. It was a disease-modifying treatment in 100% of cases and the treatment consisted of tenofovir 300 mg once a day in all patients. All patients honored the treatment and their source of funding for the treatment was personal and/or family in 57.14% ($n = 4$) and 42.86% ($n = 3$), respectively. There was a new cure bringing the number of cures to three (03), 26 patients (89.65%) were chronic carriers. Two (02) cases of liver cirrhosis were reported and no case of death was recorded in the 12th month (Table 3).

Table 4: 18-month's outcome of people screened for positive HBsAg during in a community-based setting in Ouagadougou in July 2018.

| 18-month follow-up | Frequency | Percentage (%) | p |
|---|-----------|----------------|-----------|
| Follow-up since screening | | | < 0.001 |
| Yes | 64 | 73.56 | |
| No | 23 | 26.44 | |
| Patient followed up | | | 0.12 |
| Yes | 20 | 22.99 | |
| No | 34 | 39.08 | |
| Stop | 33 | 37.93 | |
| Reasons for non-follow-up | | | < 0.001 |
| Does not find a need | 20 | 58.82 | |
| Lack of financial means | 10 | 29.41 | |
| Unaware of follow-up | 3 | 8.82 | |
| Lack of qualified personnel in place of residence | 1 | 2.94 | |
| Reasons for discontinuing follow-up | | | 0.006 |
| Does find a need | 13 | 39.39 | |
| Lack of financial means | 13 | 39.39 | |
| Lack of qualified personnel in place of residence | 6 | 18.18 | |
| Healed | 1 | 6.06 | |
| Family screening | | | < 0.001 |
| During the first 6 months | 63 | 72.41 | |
| No | 15 | 17.24 | |
| After 6 months | 9 | 10.34 | |
| Treatment | | | 0.65 |
| Yes | 9 | 45.00 | |
| No indication | 11 | 55.00 | |
| Outcome | | | < 0.001 |
| Chronic carrier | 18 | 90.00 | |
| Healed | 0 | 0.00 | |
| Liver cirrhosis | 2 | 10.00 | |
| Death | 0 | 0.00 | |

Regarding the follow-up of HBsAg carriers at 18 months of the 87 patients, 20 were followed up (old and new). The reasons for not following up at 18 months were that 58.82% of carriers thought that follow-up was not necessary for them, while the lack of financial means represented 29.41% of the reasons for not seeking follow-up and 39.39% of reasons for stopping follow-up ($p < 0.001$). During the 18th month follow-up check, nine patients (45% of patients followed) required an indication for treatment. This was a disease-modifying treatment in 100%

of cases and the treatment consisted of tenofovir 300 mg per day in one, in all patients. All patients honored the treatment and their source of funding for the treatment was personal and/or family in, respectively, 55.56% ($n = 5$), and 44.44% ($n = 4$). No new cure at the 18th month. However, 18 (90%) of 20 patients were chronic carriers; two (02) cases of liver cirrhosis were found. No case of death was recorded by the 18th month follow-up (Table 4).

Overall assessment of HBsAg-positive patients at the end of the 18 months follow-up showed that, of the 693 people who screened negative for hepatitis B, 73.59% were vaccinated post-screening. A total of 33 patients (37.93%) received regular support during the 18-months follow-up after screening. This support was psychological in 88.89% of cases, medical in 61.11% of cases or financial in 33.33% of cases. The majority had as a donor the association SOS Hépatite Burkina (71.05%), which offers psychological and medical support. Some benefited from family support (21.05%) which provided them with psychological and financial support, others from their employer (7.89%) for financial support. Three (03) patients were cured at the end of the follow-up. However, only 18.09% ($n = 17$) of them had regular medical follow-up throughout the follow-up period.

Discussion

This study allowed us to know the outcome of people tested for hepatitis B in the community over 18 months in Ouagadougou. Of the 94 patients initially diagnosed as HBsAg-positive, 7 were lost to follow-up, and only 18.09% ($n = 17$) of them received regular medical follow-up. Of the 17 patients who benefited from regular monitoring, 15 patients were chronic carriers, two (02) cases of complications such as cirrhosis of the liver were found, and no case of death was recorded. At each visit, more than 55% of the patients who were not followed up gave the reasons of not needing the follow-up. 17.24% of the patients did not have family screening and the reasons given were lack of counseling in 73.33% of cases and financial constraints in 26.67%. The major limitation of the study was the 7.4% of patients lost to follow-up, which generates a potential selection bias. However, it is clear that this study is the first in Burkina Faso to follow people over a year and a half to describe their future outcome after hepatitis B screening in a community-based setting. Even though the study took place in the capital of the country, it gives an idea of what will be the medical follow-up of such groups of people in provinces where the technical facilities and access to care are less. The low follow-up rate and the dropouts as well as the reason "no need for follow-up" are a call to the authorities for a better policy to fight against the disease.

In our study, 88.06% of participants tested negative for HBsAg. Of these, 73.59% were vaccinated (received at least one dose) after screening. Tao et al. reported 60.5% of participants having benefited from vaccination coverage of three (3) doses after negative screening. This high rate of participation in vaccination reflects the anxiety of the population vis-a-vis the viral hepatitis, but above all, it shows that the awareness or the message given during the campaign is effective. However, in the absence of subsidies, the cost of the vaccine remains high and represents a barrier, despite the willingness of participants to be vaccinated against hepatitis B.

At six (6) months, 54.02% of the patients were followed up. At twelve months, the number of patients was 33.33% and at eighteen (18) months, 22.99%. The proportion of cases followed up remains low and has steadily decreased, with only

18.09% being followed up regularly. Giles-Vernick et al. found 8/30 patients followed up, i.e. a rate of 26.66% [21]. The analysis of our series reveals that the reasons for non-follow-up were the lack of perceiving the need for follow-up which accounts for 55% at six (6) months, 57.58% at twelve (12) months and 58, 82% at eighteen (18) months. This result could be explained by the participants' lack of knowledge on hepatitis B. Our results agree with those of Ispas et al. who found in the analysis of their series, that one of the factors most frequently mentioned for not having adequate surveillance was the patient's lack of knowledge of hepatitis B [22]. In fact, these asymptomatic HBsAg carriers ignored the importance of monitoring, which would allow them to remain asymptomatic for a long time and avoid complications such as decompensated cirrhosis and hepatocellular carcinoma. It is often, in such advanced states that subjects infected with HBV arrive in hospitals, as a last resort, but ineffective at this stage.

This ignorance of patients calls out to all those involved in the fight against hepatitis, one of whose prerogatives must be to raise awareness among HBV patients. The lack of financial means was the second reason for the lack of follow-up. Also, 44.00% of patients at 12 months and 39.39% at 18 months had stopped follow-up due to lack of financial resources. This study was carried out in a developing country, with low-income inhabitants, a population living below the poverty line, without universal health insurance, while the medical costs of HBsAg carriers are their responsibility. Few are able to meet the costs of the examinations and the drug costs of their follow-up. Vignier et al. reported that 80% of women and 70.5% of chronic carriers did not seek care because of lack of financial resources [23]. A study in Ghana, led by Adjei et al. identified the high cost of care (from lab tests to prescription drugs) as a major barrier to continued care [20]. All these difficulties reflect the non-operationalization of the HBV control program in Burkina Faso, while the disease is epidemic in nature nowadays. It is therefore necessary to set up a program for early treatment of patients and thus prevent the spread of the disease and the development irreversible complications.

In our study, treatment was indicated in 14.89% at month 6, 27.59% at month 12, and 45% at month 18. It was a maintenance treatment in 100% of cases and the nature of the treatment was tenofovir 300 mg per day as a single dose. All patients honored this treatment. Diao had similar results to ours where all of his treatment participants were managed with tenofovir [24]. On the other hand, our results are superior to those reported by Son, 79.4%, by Sane 86.9%, and by Diallo, 94.82% [25-27]. The use of tenofovir in the disease-modifying treatment is linked to its high efficacy and its tolerance. This nucleotide analog allows the control of viral hepatitis B multiplication with an absence of induced mutation in DNA polymerase. Although it was developed for HIV infection in resistance situations, it appears to be an excellent candidate for HBV-HIV viral co-infections, where it has shown efficacy in controlling the multiplication of lamivudine-escaping mutants [28].

This analogue is the latest antiviral to be the marketed and is currently preferred over other analogs because of its better efficacy and the lack of resistance described to date. It is effective in patients resistant to lamivudine and entecavir. The WHO recommends it as the drug of first choice. It has become the first prescription for practitioners.

After 18 months of follow-up, taking into account cures and participants being followed up regularly, there were 15% re-

coveries, 75% chronic carriers, and 10% cirrhosis-type complications. There were no deaths. Diallo and Diao found different proportions than the ones in our data, respectively 0.96% and 93.5% for cured patients, 60.71% and 6.5% for chronic carriers, and, 22.11% and 0.00% for cirrhotic patients [24,27]. These discrepancies could be related to the duration of studies, the mode of transmission of the disease, the age at time of infection. Indeed, chronicity is very frequent, around 90% in newborns whose mothers are infected with HBV, in the absence of neonatal serovaccination. This risk decreases to 25% in children infected before the age of four and becomes low, around 5%, in immunocompetent adults under the age of 50 [29]. Also, in the context of sub-Saharan Africa, perinatal and intra-familial transmission is frequent. This suggests that mother-to-child transmission may be the most common mode of transmission among our participants. In view of the large number of chronic carriers and the existence of complications in some, a good policy is therefore needed for regular monitoring and good management of these patients, to avoid possible complications and above all, mortality linked to hepatitis B.

A total of 17.24% of people who tested positive for HBsAg did not undergo family screening and the reasons given were lack of counseling in 73.33% of cases and financial constraints in 26.67%. Sandouidi in Burkina reported as a major constraint to family screening, the lack of financial means 30% [30]. This could be explained by the type of our survey and the respondents. In our study, we spoke to the HBsAg carriers to seek information on screening from their relatives, while for that of Sandouidi, she spoke to the family of incident cases who have already been informed on the status of their relatives. This difference could then be explained by the lack of sharing of his/her status with their entourage. Nevertheless, free screening could increase the proportion of family screening.

Conclusion

The prevalence measured in our study maintains Burkina Faso as a highly endemic country. The high vaccination coverage in HBsAg-negative subjects after the screening campaign was the main interest of the screening campaign in the prevention of hepatitis B. However, the high proportion of patients not followed up and the reasons put forward such as the non-perception of the need for patient follow-up and the high cost of treatment showed that despite the severity of hepatitis B, it remains neglected. Hence, the importance of strong public health policies to remove the obstacles linked to lack of follow-up in order to avoid the progression towards complications but also the spread of the disease. These policies must include the strengthening of communicative activities, the reduction of the cost of vaccination and the care of patients at all levels. The known severity of hepatitis B makes it necessary to make it a disease with an operational control program with free services.

Declarations

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Authors' contributions: Pauline Kiswendsida YANOGO posed the problem and the objectives of the study, proposed a draft study protocol and interpreted the data analysis, corrected the manuscript, validated the manuscript.

Estelle Nadine SANOU wrote the study protocol, collected data, analyzed the data, interpreted the data analysis, proposed the draft manuscript.

Nicolas MEDA corrected the manuscript and gave final approval of the version to be published.

All authors agreed to be responsible for all aspects of the work ensuring that matters relating to the accuracy or integrity of any part of the work are properly addressed.

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