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Socio-professional Profile of Individuals Living with Human Immunodeficiency Virus Who Tested Positive for HBsAg At the Laboratory of the Regional Hospital of Faranah, Guinea, 2022

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Abstract Co-infection with Human Immunodeficiency Virus (HIV) and Hepatitis B Surface Antigen (HBsAg) is a major public health challenge, particularly in sub-Saharan Africa. Knowledge of the socio-professional profiles of the individuals concerned is essential to strengthen appropriate prevention and treatment strategies. This study aimed to estimate the frequency of hepatitis B among people living with HIV at the Faranah Regional Hospital in 2022 and to identify the socio-professional factors associated with this co-infection. A cross-sectional study was conducted among 158 people living with HIV who were seen at the laboratory of the Faranah Regional Hospital between October and December 2022. We used the 'SD-Bio line AgHBs' immunochromatographic test for analysis. The data showed a seroprevalence of 18.82% for HIV/HBV co-infection, with a 95% confidence interval (CI): 12.82% - 25.02%. The median age was 32 years with an interquartile range of 17 years. Among the study population, women were the most co-infected (21.4%); the age group (adolescents, young people and adults) was the most affected with a rate of 93.3%; unmarried people predominated over married people with 60%; artisans and traders represented 63.3%. This study has enabled us to highlight the high prevalence of HIV/HBV co-infection and to understand the profiles of people living with HIV in Faranah. It would be crucial to implement effective diagnostic strategies in order to improve the quality of life of PLHIV in the Republic of Guinea.

Keywords: *PLHIV, HBsAg, Socio-professional characteristics, Faranah, Guinea*

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1. Introduction

Hepatitis B virus is a global public health problem. Approximately 254 million people are chronically infected with hepatitis B virus and are therefore at risk of developing liver cirrhosis and hepatocellular carcinoma [1].

Hepatitis B virus infection is effectively prevented by vaccination. HIV remains an important transmissible disease worldwide, contributing to significant morbidity and deaths each year [2]. HIV increases HBV chronicity rates, prolongs HBV circulation and increases liver-related morbidity [3]. Co-infection with hepatitis B virus is observed in approximately 7-10% of HIV-infected patients [4]. These infections share the same modes of transmission, including parenteral, sexual and mother-to-foetus, suggesting a high risk of co-infection with both viruses in the same patient [3,5].

Knowledge of this co-infection is essential for the monitoring and treatment of patients in order to reduce the risk of mortality in people living with HIV. HBV infection can complicate the treatment of immunocompromised individuals undergoing antiretroviral therapy. It is associated with an increase in liver diseases such as cirrhosis and hepatocellular carcinoma and can cause HIV infection to progress to AIDS and then to death [6]. Progression is approximately twice as likely in co-infected patients as in mono-infected patients [7].

In sub-Saharan Africa, the prevalence of HIV/HBV co-infection varies between 10 and 20% in West and Central Africa [8]. The progression of HBV infection to the chronic phase in this region is estimated at over 10%. This increases the risk of progression to end-stage liver disease [9].

In the Central African Republic, a survey conducted at the Sino-Central African Friendship Hospital in Bangui revealed a 7.7% prevalence of HIV/HBV co-infection [10]. In Senegal, a study conducted in 2021 among PLHIV in urban areas showed a prevalence of HIV/HBV co-infection of 12.4% [11]. In Burkina Faso, a prevalence of 12.86% of HIV/HBV co-infection was observed in an association providing medical care in the city of Ouagadougou in 2016 [12].

Despite international recommendations, systematic diagnosis of hepatitis B remains insufficient, highlighting an urgent need to improve screening and awareness practices [11].

In the Republic of Guinea, little data is available on HIV/HBV co-infection. Studies conducted among PLHIV in the haematology department of the Ignace Deen National Hospital and the Sino-Guinean Friendship Hospital showed prevalences of 8.49% [8] and 2.3% [13] of HIV/HBV co-infection, respectively. Similarly, another study conducted at the N'Zérékoré Regional Hospital among blood donors reported a 0.2% prevalence of HIV/HBV co-infection [14].

In the Faranah region, despite the health context marked by an estimated HIV prevalence of 1.2% in 2018 [15] among adults, data on HIV/HBV co-infection remains very limited. This makes it difficult to understand the extent of the problem in this region.

The challenges facing the Guinean health system, such as limited access to care, inadequate screening and treatment infrastructure, and insufficient awareness-raising among at-risk populations, highlight the need for research on this topic.

The objective of this study was to determine the prevalence of hepatitis B among people living with HIV at the Faranah Regional Hospital and to identify associated factors, in order to contribute to a better understanding of HIV/HBV co-infection.

2. Methodology

2.1. Study Design and Setting

A cross-sectional study was conducted from 1 January to 31 December 2022 to estimate the prevalence of hepatitis B among patients living with HIV treated at Faranah Regional Hospital (HRF). The laboratory at Faranah Regional Hospital served as the study setting. Faranah Regional Hospital (HRF), located in downtown Faranah in the market district, is a facility with a threefold mission: care, research and training. Under the authority of the Ministry of Health and Public Hygiene of the Republic of Guinea, it enjoys legal personality, financial autonomy and management autonomy in accordance with the laws and regulations governing public and administrative institutions (Article 2 of Decree 98/055/PRG/SGG).

2.2. Study Population and Sample Size

During the data collection period, all PLHIV aged 18 years and older who did not know their hepatitis B serological status and who freely agreed to participate in the study were systematically considered eligible. A total of 158 participants were selected during the study period.

2.3. Data Collection and Laboratory Analysis Procedures

After obtaining informed consent, an electronic questionnaire designed on KoboCollect was used. The data collected related to the socio-professional characteristics of the patients, including age, gender, marital status and occupation. Participants were also asked to provide a venous blood sample.

The SD-Bioline immunochromatographic test was used for analysis, in accordance with the manufacturer's instructions. After removing the cassette from its pouch, 100µl of blood serum was placed in the sample compartment, avoiding the formation of air bubbles. Depending on the concentration of anti-HBs antibodies in the sample, the test can react within 5 minutes.

The result is considered negative if only one line appears in the C zone, indicating that hepatitis B surface antibodies are absent.

The result is positive if both the test line (T) and the control line (C) appear, indicating that hepatitis B surface antibodies are present in the sample. Even if the concentration of hepatitis B antibodies is low, the sample will cause a faint colour to appear in the T zone. The result is invalid if the control line (T) does not appear. Results should be read and interpreted within 15 to 20 minutes.

2.4. Statistical Analysis of Data

Categorical variables were summarised as absolute frequencies and percentages, and quantitative variables were described in terms of median and interquartile range. Bivariate statistical analyses (Chi2 test or Fisher's exact test) were used to compare the proportions of PLHIV status with HBsAg with their socio-professional characteristics (P-value < 0.05 indicates a significant dependence). The distribution of HIV/HBV co-infection among HIV-positive individuals according to their socio-professional characteristics was represented as a horizontal bar chart. R 4.2.2 software was used to process and analyse the data.

2.5. Ethical Considerations

This study was conducted in accordance with ethical standards approved by Guinea's National Scientific Research Committee (Minutes No. 129/CNERS/16, 31 August 2015). Informed consent was obtained from all participants prior to their inclusion in the study. The confidentiality of the information obtained from participants was guaranteed.

3. Results

Socio-demographic characteristics of participants

Table 1. Socio-demographic characteristics of HBsAg-positive PLHIV received at the laboratory of the Regional Hospital of Faranah, Guinea 2022

Characteristics	Number (Percentage)
Sexe	
Male	102 (64.6%)
Female	56 (35.4%)
Age	
Median (Q1, Q3)	32 (25.42)
Age group	
Adolescents, young adults, and adults	140 (88.6%)
Senior citizens	18 (11.4%)
Marital status	
Married	43 (27.2%)
Unmarried	115 (72.8%)
Occupation	
Craftsmen and traders	89 (56.3%)
Managers	11 (7.0%)
Pupils/students	20 (12.7%)
Housewives	38 (24.1%)

A total of 158 people living with HIV were included in the study and were divided according to socio-demographic characteristics (Table 1). Among them, 56 were women and 102 were men (35.4% and 64.6% respectively). The median age was 32 years with an interquartile range of 17 years. Adolescents, young people and adults were the most represented (140; 88.6%). The population consisted mainly of unmarried people (72.8%) and married people (27.2%). Craftsmen and traders (56.3%) and housewives (24.1%) constituted the largest socio-professional group.

Table 2. Distribution of HIV/HBV co-infection among HIV-positive individuals according to their socio-professional characteristics

Variable	Category	Percentage (%)
Marital status	Not married	18 (60.0)
	Married	12 (40.0)
Sex	Male	18 (60.0)
	Female	12 (40.0)
Occupation	Housewife	7 (23.3)
	Pupil/Student	2 (6.7)
	Executive	2 (6.7)
	Artisan and trader	19 (63.3)
Age group	Elderly people	2 (6.7)
	Adolescents, young people and adults	28 (93.3)

The frequency of hepatitis B co-infection among PLHIV was 18.82% with a 95% confidence interval (CI): 12.82% - 25.02%. It varies according to socio-professional characteristics (Figure 1). Women living with HIV were the most co-infected with hepatitis B (21.4%). Adolescents, young people and adults have an HIV/HBV co-infection rate of 20%, and older people have the lowest rate (11.1%). Among the study population, married individuals were the most exposed (27.9%). However, the most at-risk occupation was that of artisans and traders (21.3%), followed by executives (18.2%).

Table 3. Factors associated with HBsAg in people living with HIV

Characteristics	Negative N = 128	Positive N = 30	p-value
sex			0.6
Male	84 (65.6%)	18 (60.0%)	
Feminine	44 (34.4%)	12 (40.0%)	
Age group			0.5
Adolescents, Young People and Adults	112 (87.5%)	28 (93.3%)	
Senior citizens	16 (12.5%)	2 (6.7%)	
Marital status			0.008
Married	31 (24.2%)	12 (40.0%)	
Unmarried	97 (75.8%)	18 (60.0%)	
Occupation			0,7
Craftsmen and traders	70 (54.7%)	19 (63.3%)	
Managers	9 (7.0%)	2 (6.7%)	
Pupils/Students	18 (14.1%)	2 (6.7%)	
Cutlery sets	31 (24.2%)	7 (23.3%)	

The results on factors associated with hepatitis B co-infection in people living with HIV (PLHIV) are presented in Table 2. With regard to HIV/HBV co-infection, this analysis shows that there is no significant difference between men and women (p-value = 0.6) or between age groups (p-value = 0.5). However, marital status has a significant effect on HIV/HBV co-infection, with married individuals having a significantly lower risk than unmarried individuals (p-value = 0.0080). Furthermore, there is a trend towards a higher, but not significant, risk among PLHIV who are artisans and traders.

4. Discussion

HIV/HBV co-infection is a major public health issue, particularly in regions where both infections are common. This phenomenon presents particular challenges in terms of treatment and improving patient health.

This study aims to examine the socio-professional profile of PLHIV co-infected with hepatitis B at the Faranah Regional Hospital, highlighting patient characteristics and the implications of these observations for public health.

In this study, a seroprevalence of 19% for HBsAg among PLHIV was observed. This rate differs from the results of previous studies conducted in the haematology department of Ignace Deen National Hospital, which found a prevalence of HIV/HBV co-infection of 8.49% [8], 9.17% at Donka Day Hospital [16] and 2.3% at the Sino-Guinean Friendship Hospital among patients receiving HIV and hepatitis B screening [13]. However, an estimated HIV/HBV co-infection seroprevalence of 16.9% was found in a study conducted in Benin in 2015 [17], which is close to our overall prevalence.

This high prevalence in our study could be explained by non-adherence to the treatment regimen, abandonment of antiretroviral treatment in favour of traditional treatment,

and a lack of communication between spouses about their serological status. The results suggest that HIV/HBV co-infection requires special attention in the programme.

There were no significant differences in socio-demographic characteristics (age group, gender) or occupational characteristics (p-value>0.05), which is similar to the results obtained in a survey conducted among university students in Nigeria [18] and among PLHIV at the Donka Day Hospital in Guinea [16].

The age group of co-infected patients is often between 30 and 50 years old. This age group, considered to be sexually active, is particularly affected by risky behaviours. Young adults may also face challenges related to education and awareness of healthy sexual practices, thus increasing their vulnerability to co-infection. The fact that this age group is the most affected highlights the need to strengthen prevention programmes specifically tailored to this group.

The results indicated that the majority of PLHIV co-infected with hepatitis B were women (21.4%). The overrepresentation of women in cases of co-infection could be linked to more frequent risk behaviours, such as unprotected sex, limited access to care and screening, female genital mutilation, which is an overlooked factor, and illiteracy. This observation is similar to the HIV/HBV co-infection study conducted in Central Africa, which found that women were more co-infected than men, at 70.9% [10].

In our study, unmarried individuals predominated over married individuals, with

However, several limitations must be taken into consideration.

The sample size may limit the applicability of the results to a larger population; the non-use of more sensitive diagnostic techniques such as ELISA and PCR. Future studies could benefit from a longitudinal methodology and a qualitative survey to explore the determinants of co-infection in greater depth.

5. Conclusion

This study highlighted the socio-professional profile of people living with Human Immunodeficiency Virus (HIV) and HBsAg-positive at Faranah Regional Hospital in 2022. The results indicate that the majority of participants were in the working age group and had a variety of occupations, which could suggest a significant public health concern. The socio-demographic characteristics observed showed disparities in factors such as marital status and occupation. These findings highlight the importance of education and awareness-raising. To strengthen public health efforts, it is important to develop tailored programmes that take into account the socio-professional realities of these individuals, incorporating multisectoral approaches that promote psychosocial support and improved living conditions. Collaboration between health authorities and community organisations is essential to improve early diagnosis, treatment and care for co-infected individuals.

Conflicts of Interest

The authors declare no conflicts of interest.

Authors' Consent

All authors declare that they have read and approved the final version of the manuscript.

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