

Original Research Article

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Prevalence and Factors Associated with Serological Detection of Hepatitis B and C in Women of Childbearing Age Received at the Union Hospital in the N'Djamena South Health District in Chad

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ABSTRACT

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Viral hepatitis is an inflammation of the liver caused by a DNA virus in the case of hepatitis B virus (HBV) and RNA in the case of hepatitis C virus (HCV) and present on all continents. This was a descriptive study with analytical aims carried out from January 2024 to May 2024 in women of childbearing age received at the Union Hospital in the Health District of N'Djamena Sud. The data were collected using a data collection sheet and diagnosis of HBV and HCV was carried out with immunochromatographic tests on the cassettes. Total of 423 patients were enrolled. Among them, 39 samples from patients were positive and 384 negative for HBV giving a prevalence of 9.12% and 3 samples from patients were positive and 420 negative for HCV giving a prevalence of 0.71%. The prevalence of viral hepatitis was 9.83% in women of childbearing age. The age group of 25 to 34 years was the most represented with a frequency of 39.72% followed by that of 20 to 24 years with a rate of 35.22%. In this study, married women were the most represented, with a rate of 58.86% followed by women in cohabitation with a rate of 37.11%. Traders represented 31.91% and housewives a rate of 30.02% in this study. The prevalence was very high in patients with a secondary education level with 39.01% and 23.40% in patients with a primary education level. The factors influencing the circulation of HBV in this study were related to tattooing, multiple partnerships including 33.33% of recorded cases, 27.27% related to a case of HBV in the family; while those influencing the circulation of HCV were related to tattooing (33.33%). This study showed that HBV and HCV still circulate within the population despite systematic HBV vaccination among women attending prenatal consultations.

Introduction

Viral hepatitis is an inflammation of the liver caused by a virus of the hepadnaviridae family, hence HBV and HCV (Tchadine, 2021). Viral hepatitis B and C constitute a major public health problem worldwide. Hepatitis B virus (HBV) and hepatitis C virus (HCV) are two major causes of mortality and morbidity. They are responsible for two out of three deaths related to liver cancer worldwide and are the seventh leading cause of mortality worldwide. The magnitude of HBV is heavier in the Western Pacific and African regions. On the other hand, HCV is more important in the Eastern Mediterranean and European regions (WHO, 2016; Mve *et al.*, 2019; Berthe, 2021; Mvumbi, 2022).

According to the Global Hepatitis Alliance, more than 300 million people living with hepatitis need to improve their lives. Because liver cancer-related mortality cases are increasing. In late 2023 and early 2024, there will still be 2.2 million new infections, with 13% of people with hepatitis B diagnosed but only 2% treated and 36% of people with hepatitis C diagnosed but only 20% treated (GHA, 2024).

The diagnosis of HBV in women of reproductive age (aged 15 to 49 years) remains alarming. The prevalence of chronic HBV infection is 10.4% in women of reproductive age aged 15 to 49 years. This represents a high risk rate of 12% for mother-to-child transmission of HBV in women of childbearing age. In addition, the vast majority of women do not know their HBV serological status despite high attendance at antenatal care (Tchadine, 2021).

The World Health Organization (WHO) estimates the number of chronic HCV carriers at 50 million and the number of new infections occurring each year at approximately 1.0 million. WHO estimates the number of deaths due to HCV in 2022 at approximately 242,000, most of them from cirrhosis or hepatocellular carcinoma (primary liver cancer) (WHO, 2024). Of the 47 countries in the WHO African Region, 18 have HBV prevalence rates above the endemic threshold (8%). Chad has a HBV seroprevalence of 19% and a rate of 2.5% for HCV (Ndiokubwayo, 2022; iHAO-WHO, 2023). In 2022, the seroprevalence of HBV and HCV among women seen in antenatal consultation is 4.6% for HBV and 2.5% for HCV (Ndiokubwayo, 2022). The objective of this study is to determine the seroprevalence of hepatitis B and C and the factors influencing their circulation among

women of childbearing age received at the laboratory department of the Union Hospital (HU) in the N'Djamena South Health District.

Materials and Methods

Type and Area of Study

This was a descriptive study with an analytical aim conducted among women of childbearing age in the laboratory department and the Prenatal Consultation Unit (PNC) of the maternity department of the UNION Hospital in the Health District of N'Djamena South. The UNION Hospital is located in N'Djamena, the political capital of the Republic of Chad. The Hospital is bordered to the North by the ESPOIR medical clinic, to the South by the Embassy of the United States of America, to the East by the building of the Chadian Justice Support Project (PRAJUST) and to the West by the Social Center number six. It is a public administrative and scientific establishment which is placed under the supervision of the Ministry of Public Health.

Sampling

The sampling was non-probabilistic and carried out voluntarily. It began with a census of 566 female patients who came for consultation at the maternity department. Among them, 423 patients had agreed to sign the informed consent to participate in this present study, 36 patients were under 15 years old and therefore were not included in the study, 33 patients were already in menopause and therefore excluded from the study and 84 patients had refused to sign the consent and therefore were not included in the study.

Study Population

The study population consisted mainly of female patients aged 15 to 45 years admitted to the maternity and laboratory department of the HU with a consultation booklet or an examination report for the search for HBV and HCV antigen and especially consenting to participate in this study. Informed consent was read and approved by each participant. Samples were taken from Monday to Saturday, from 7:30 a.m. to 10:00 a.m. in a dry tube.

Data Collection Method

The collection of data and sera from patients was carried out from January to May 2024. For each sample, several

pieces of information were collected in a data collection sheet designed for this purpose. These data were: the sociodemographic characteristics of the patients (age, sex, marital status, profession, origin and level of education), the reason for consultation, factors related to the circulation of hepatitis B and C and the serological status of patients with HBV and HCV.

Serum Sample Analysis Technique

HBV Screening test

For the antigen search, we used the Rapid HBsAg Test Cassette from the firm "ALL TEST™" (2019). It is a rapid test for the qualitative detection of the HBV surface antigen in blood. The Cassette is a two-site sandwich immunoassay in solid phase and qualitative for the detection of HBV. The membrane pre-induced anti-HBsAg antibodies on the line area of the test part of the cassette. After the sample is deposited, the serum reacts with the induced anti-HBsAg antibody particle. The mixture migrates upwards on the chromatographic membrane by capillary action to react with anti-HBsAg antibodies on the membrane and generates a colored line. The cassette contains anti-HBsAg particles and anti-HBsAg antibodies that are applied to the membrane. Relative sensitivity of the test: 99.9%, relative specificity: 99.6% and the accuracy is 99.7%. This test has a sensitivity of 99.9% and a specificity of 99.96% for the antibody line and 99.76% for the antigen line. Reference number REF IHBSG-402 (All Test, 2019).

HCV Screening Test

For the search for antigen and antibodies, we used the Abbott HCV Antibody Detection Test Strip. The Bioline™ HCV is a rapid in vitro immunochromatographic assay for the qualitative detection of HCV-specific antibodies in sera. This test consists of a Nitrocellulose membrane strip coated with recombinant HCV capture antigen (capsid, NS3, NS4 and NS5) at the test line (T).

The protein A-gold-Colloidal conjugate and the sample move on the membrane by chromatography to reach the test zone, where the Antigen-antibody-protein A-gold particle complex forms a visible line with a high degree of sensitivity and specificity. The letters "T" and "C" are written on the surface of the test device housing, to indicate the test line and the control line.

The test and control line and the result window are not visible before the application of the sample. The control line is used to control the procedure. It systematically appears if the procedure has been carried out correctly and the reagents of the control line are working. The Bioline™ HCV has a sensitivity of 100% and a specificity of 99.4%. Reference number REF 7D2342 (Abbott, 2022).

Data Analysis

The data from the interviews with the patients as well as the results of the tested sera were recorded in a data collection sheet, then entered into an Excel spreadsheet in Microsoft Office 2016 and converted into CSV after exporting to the R Studio software version 4.0.4.2021 for analysis. Regarding analytical statistics, the Chi-square test and the Pearson test were used to determine the prevalence of HBV and HCV as well as their significance. The significance threshold was set at 0.05 and the p-value calculated from the Pearson test.

Following the laboratory serological analyses, the results below were obtained.

Results and Discussion

Sociodemographic Variables

Our study took place from January 2024 to May 2024. During this study, 423 patients were enrolled. Among these patients, 39 patient samples tested positive and 384 negative for HBV, a prevalence of 9.12% and 3 patient samples were positive and 420 negative for HCV with a prevalence of 0.71%.

Distribution of Patients by Age Group

The mean age in this study was 39.72 years. The extremes were 15 years and 45 years. The age group from 25 years to 34 years was the most represented with a frequency of 39.72% followed by that of 20 years to 24 years with a rate of 35.22%.

Distribution of Patients according to Marital status

In this study, married women were the most represented, with a rate of 58.86% followed by women living in cohabitation with a rate of 37.11%.

Distribution of patients by profession

According to the profession of the patients, shopkeepers represented 31.91% followed by students with a rate of 17.26%.

Distribution of patients according to the level of education

According to the level of education of the patients from this study, 39.01% had a secondary level of education and 23.40% of the patients had a primary level of education.

Distribution of patients by district and neighborhood

In this study, 52.24% (n = 221) of patients came from the 7th district and 31% (n = 131) from the 9th district of the city of N'Djamena. Patients from the Walia district were the most represented with 25.29% (n = 107 patients), followed by patients from the Chagoua district with 24.11% (n = 104).

Biological variables

Seroprevalence of HBV in patients

In this study, the prevalence of HBV in women of childbearing age was estimated at 9.12%. This prevalence is highly significant with a P-value = 0.00033334.

Seroprevalence of HCV in patients

In this cohort, the overall prevalence of HCV in patients of childbearing age was 0.71%. This seroprevalence is significant with a P-value = 0.012455.

Clinical variables

Prevalence of HBV according to reasons for consultation

In this study, 33.33% of patients were received in emergency, 12.50% of patients were outpatient consultations and a prevalence of 8.98% in patients in PNC. These results were not significant with a P-value > 0.05.

Distribution of patients according to the prevalence and factors associated with the circulation of HBV

In this study, some factors had influenced the circulation of HBV and its maintenance. The factors associated with the circulation of HBV were linked to blood transfusion with a prevalence of 7.69%. This prevalence is not significant (P-value > 0.05). A prevalence of 27.27% was obtained in some patients who lived with people infected with HBV in their families. This prevalence was very significant with P-value = 0.001266. A rate of 21.74% of HBV positive patients had claimed to undergo surgery. This prevalence is not significant (P-value > 0.05). In this cohort, 33.33% of HBV positive patients claimed to have multiple sexual partners. This prevalence is highly significant with a P-value = 0.00986. Some patients had scarifications and others claimed to have been excised, a prevalence of 13.04%. This prevalence is significant with a P-value = 0.056123. Other patients had piercings on the nose, lips or the umbrina to put an earring, a rate of 9.26%. These results are very sensitive with P-value = 0.0026216. A prevalence of 33.33% was recorded in HBV-positive patients who had just had tattoos. This rate is highly sensitive with P-value = 0.007757. A prevalence of 16.66% in patients who had undergone dental care. This prevalence is not significant (P-value > 0.05). The prevalence of HBV was 8.42% in women who consumed alcohol. This prevalence is significant with P-value = 0.051778.

Prevalence and Factors influencing the circulation of HCV

Some factors were associated with the increase in the prevalence of HCV and its maintenance in some patients. These associated factors were linked to the presence of a case of HCV within the family with a prevalence of 9.10%. This rate is significant with P-value = 0.0598612. A prevalence of 4.35% in patients who claimed to have undergone surgery in the last two years. This rate is not significant with P-value > 0.05. A proportion of 33.33% of patients claimed to have multiple sexual partners. This proportion is very significant with P-value = 0.0066266. Other factors were linked to the fact that patients had scarifications and other patients claimed to have practiced excision, i.e. a prevalence of 2.17%. This prevalence is not significant with P-value > 0.05. A rate of 0.47% of HCV positive patients had piercings on the nose, lip or umbral with P-value = 0.03361251 which is

statistically significant. A prevalence of 33.33% of HCV positive patients had tattoos. This prevalence is highly significant with P-value = 0.000333334. In this study, a prevalence of 0.53% of HCV positive patients consumed alcohol at least four times a week. This prevalence is not significant with P-value > 0.05.

Discussions and comments

Sociodemographic variables

The average age in this study was 31.72 years. The extremes were 15 years and 45 years. The age group from 25 to 34 years was the most represented with a frequency of 39.72% followed by that of 20 to 24 years with a rate of 35.22%. Our results are higher than those of 41.8% published by Boiro in 2022 in the age group 26-35 years.

In this study, married women were the most represented, with a rate of 58.86% followed by women living in cohabitation with a rate of 37.11%. These results are higher than those of 38.8% published by Tchadine in 2021 on the prevalence of hepatitis B and C in women of childbearing age. This very high rate could be explained by the fact that the UNION Hospital is the only large hospital structure in N'Djamena Sud according to the health mapping of the Ministry of Public Health. From which the technical platform of this structure is better adapted with a service available seven days a week. This obliges some patients of childbearing age to come directly either for prenatal consultation or for other gynecological problems.

According to the profession of the patients, traders represented 31.91% followed by students with a rate of 17.26%. The results of this study are higher than those of 12% among traders and 12.4% among students published by Boiro at the Toubouctou Hospital in Mali. This high enrollment of women traders could be explained by the fact that the UNION Hospital is located near small markets and not far from the Dembé market, so women find it easy to access.

According to the level of education of the patients from this study, 39.01% had a secondary level of education, 23.40% of the patients had a primary level of education and 23% of the patients were uneducated in this study. Our results are different from those of 14% among patients with a primary level of education and 44.2% uneducated published by Tchadine in 2021 among sex

workers. This difference could be explained by the fact that our study took place in a hospital setting but on the other hand their study targeted sex workers. In this study, 52.24% (n = 221) of patients came from the 7th district and 31% (n = 131) from the 9th district of the city of N'Djamena. Patients from the Walia district were the most represented with 25.29% (n = 107 patients), followed by patients from the Chagoua district with 24.11% (n = 104). This high representation of patients from the 7th district is due to the fact that the UNION Hospital is located in the 7th district of the city of N'Djamena and therefore the UNION Hospital is easy to access and approximate to these two districts (Walia and Chagoua).

Biological variables

In this study, the prevalence of HBV in women of childbearing age was estimated at 9.12%. This prevalence is very significant with a P-value = 0.000333334. The results of this study are similar to those of 9.4% published by Tchadine in 2021 in women of childbearing age. This high prevalence is explained by the simple fact that HBV screening is part of the assessments and is mandatory for women received in PNC. As a result, they are screened a lot.

In this cohort, the overall prevalence of HCV in patients of childbearing age was 0.71%. This seroprevalence is significant with a P-value = 0.012455. This prevalence is lower than those of 4.5% published by Mvumbi in 2022 among sex workers in Bamako, Mali. This difference could be explained by the fact that their study was carried out among sex workers, while ours was in a hospital setting, therefore in a heterogeneous population.

Clinical variables

Prevalence and Factors influencing the circulation of HBV

A prevalence of 27.27% was obtained in some patients who lived with people infected with HBV within their families. This prevalence was very significant with P-value = 0.001266. These results may be explained by the fact that according to a study conducted by WHO in 2023, sharing personal items such as razors, toothbrushes, nail clippers, body jewelry, and other personal items with small amounts of blood on them can spread HBV within a family or community. These statements may support our results (IAHO-WHO, 2023).

Table.1 Distribution of patients by profession

Patients profession	Effective	Percentage (%)
Trader	135	31,91
Health professionnal	06	1,42
Hairdressers	05	1,18
Seamstress	10	2,36
Puiple	73	17,26
Student	34	8,04
Teacher	03	0,71
Charwoman	11	2,60
Security Defense Force (SDF)	02	0,47
Hotelier	02	0,47
Gardener	01	0,24
Journalist	01	0,24
Homemaker	127	30,02
Unemployed fixed or Emptiest fixed	03	0,71
Emptiest diploma	10	2,36
Total	423	100

Figure.1 Distribution of patients by age group

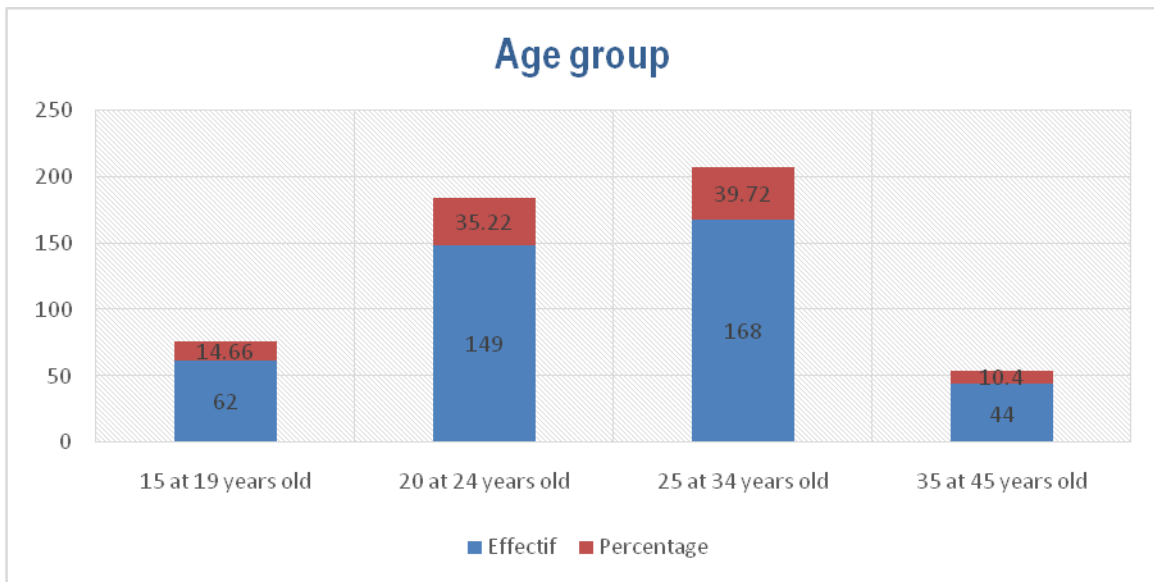


Table.2 Distribution of patients by district and neighborhood

Province	District	Neighbourhood	Effective	Percentage (%)
N'Djamena	1 st	Farcha	02	0,47
	5 th	Sabagali	05	1,18
	6 th	Moursal	21	4,96
	6 th	Dembé	26	6,15
	7 th	Siguété	03	0,71
	7 th	Mandjafa	01	0,24
	7 th	Kilwitti	02	0,47
	7 th	Kléssoum	04	0,94
	7 th	Amtoukouï	08	1,89
	7 th	Habena	18	4,25
	7 th	Gassi	38	8,98
	7 th	Dinyo	05	1,18
	7 th	Digo	03	0,71
	7 th	Chagoua	102	24,11
	7 th	Boutabagara	13	3,07
	7 th	Atrone	12	2,84
	7 th	Ambatta	12	2,84
	8 th	Djari	05	1,18
	8 th	Karkanjé	02	0,47
	8 th	Goudji	02	0,47
	9 th	Walia	107	25,29
	9 th	Toukra	12	2,84
	9 th	Nguéli	10	2,36
	9 th	Ngonba	02	0,47
Chari Baguirmi	Sub-prefecture	Kournary	02	0,24
	Sub-prefecture	Koundoul	04	0,94
Hadjer-Lamis	Prefecture	Massaguette	02	0,47
Total			423	100

Table.3 Prevalence and factors influencing the circulation of HBV

Factors influencing circulation of HBV		N	HBV+	Prevalence	CI at 95%	P-value	Interpretation
Blood transfusion	Yes	13	01	7,69	[-7.77 ; 7.60]	0.06621	No significant
	No	410	38	9,27	[-9.28 ; 9.15]		
HBV within the family	Yes	11	03	27,27	[-27.90 ; 26.63]	0.001266	Very Significant
	No	412	36	8,74	[-8.84 ; 8.64]		
Surgery act	Yes	23	05	21,74	[-21.92 ; 21.02]	0.16626	Non significant
	No	400	34	8,5	[-8.60 ; 8.41]		
Addict	Yes	00	00	00		0.08912	No significant
	No	423	39	9,22	[-9.35 ; 9.11]		
Multiple sexual partners	Yes	03	1	33,33	[-34.21 ; 32.46]	0.00986	Very Significant
	No	420	38	9,05	[-9.16 ; 8.94]		
Excision or Scarification	Yes	46	06	13,04	[-13.24 ; 12.84]	0.056123	Significant
	No	377	33	8,75	[-8.86 ; 8.64]		
Piercing	Yes	421	39	9,26	[-9.38 ; 9.14]	0.002616	Very Significant
	No	02	00	00			
Tattoo	Yes	03	01	33,33	[-34.21 ; 32.46]	0.007757	Very Significant
	No	420	38	9,05	[-9.16 ; 8.94]		
Biological accident	Yes	01	00	00		0.279812	No significant
	No	422	39	9,24	[-9.35 ; 9.12]		
Health care dental	Yes	06	01	16,66	[-17.01 ; 16.36]	0.088471	No significant
	No	417	38	9,11	[-9.22 ; 9.01]		
Alcohol consumption	Yes	190	16	8,42	[-8.52 ; 8.32]	0.051778	Significant
	No	233	23	9,87	[-10.01 ; 9.74]		

Figure.2 Distribution of patients according to marital status.

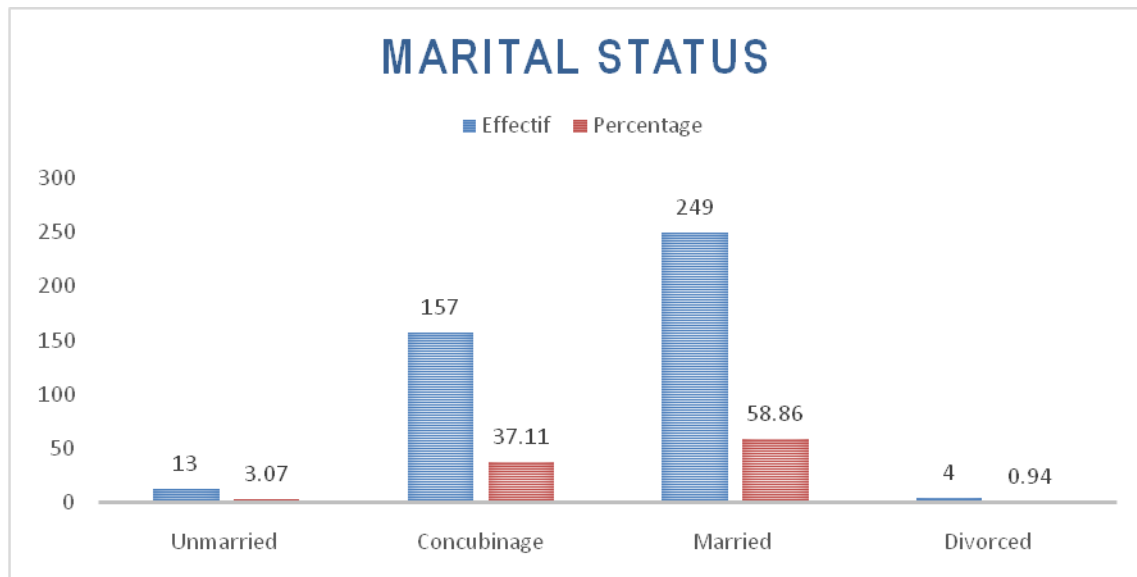
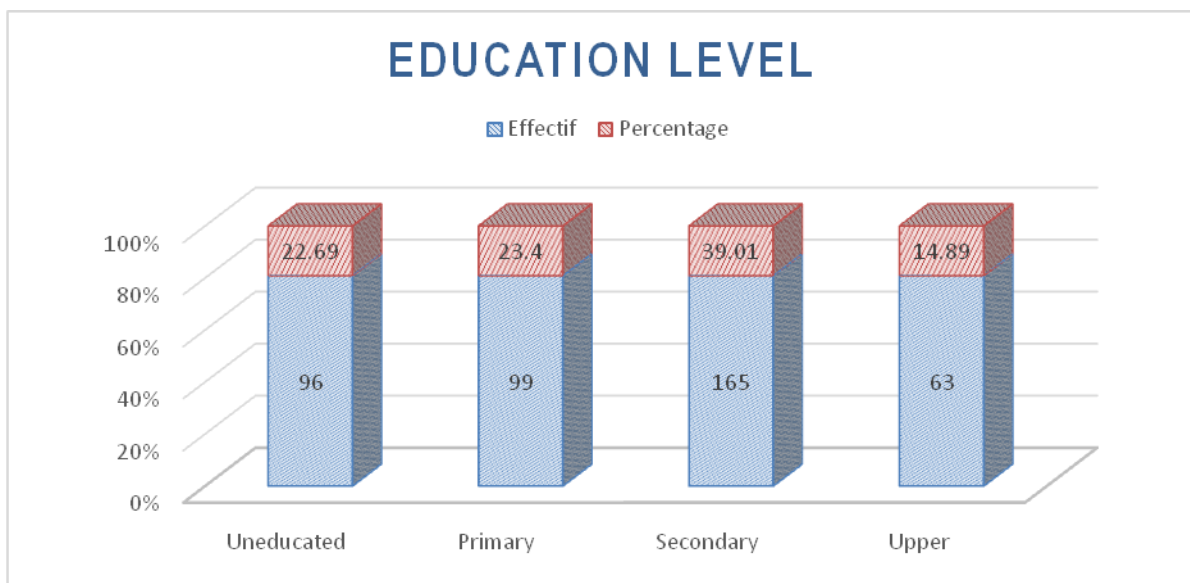


Table.4 Prevalence and Factors influencing the circulation of HCV

Factors influencing circulation of HCV	N	HCV+	Prevalence	CI at 95%	P-value	Interpretation
Blood transfusion	Yes	13	00	00		0.715420 No significant
	No	410	03	0,73	[-0.73 ; 0.73]	
HBV within the family	Yes	11	01	9,10	[-9.21 ; 9.02]	0.0598612 Significant
	No	412	02	0,48	[-0.51 ; 0.48]	
Surgery act	Yes	23	01	4,35	[-4.38 ; 4.32]	0.0766120 No significant
	No	400	02	0,5	[-0.51 ; 0.51]	
Addict	Yes	00	00	00		0.887512 No significant
	No	423	03	0,71	[-0.71 ; 0.711]	
Multiple sexual partners	Yes	03	01	33,33	[-34.21 ; 32.46]	0.0066266 Very significant
	No	420	02	0,47	[-0.47 ; 0.48]	
Excision or Scarification	Yes	46	01	2,17	[-2.18 ; 2.16]	0.00199866 Very significant
	No	377	02	0,53	[-0.53 ; 0.53]	
Piercing	Yes	421	02	0,47	[-0.47 ; 0.48]	0.03361251 Significant
	No	02	01	50	[-51.61 ; 48.41]	
Tattoo	Yes	03	01	33,33	[-34.21 ; 32.46]	0.000333334 Very significant
	No	420	02	0,48	[-0.51 ; 0.48]	
Biological accident	Yes	01	00	00		0.9899123 No significant
	No	422	03	0,71	[-0.71 ; 0.711]	
Health care dental	Yes	06	00	00		0.60126611 No significant
	No	417	03	0,72	[-0.81 ; 0.82]	
Alcohol consumption	Yes	190	01	0,53	[-0.53 ; 0.53]	0.1233332 No significant
	No	233	02	0,86	[-0.86 ; 0.86]	

Figure.3 Distribution of patients according to level of education



In this cohort, 33.33% of HBV-positive patients reported having multiple sexual partners. This prevalence is highly significant with a P-value = 0.00986. This high prevalence could be explained by the fact that sexual transmission is more common among people not vaccinated against HBV with different sexual partners who expose each other to infected blood and body fluids (saliva and menstrual, vaginal, and seminal fluids) (IAHO-WHO, 2023). Some patients had scarifications and others claimed to have been circumcised, a prevalence of 13.04%. This prevalence is significant with a P-value = 0.056123. Other patients had piercings on their nose, lips or the umbrina to put an earring, a rate of 9.26%. These results are very sensitive with P-value = 0.0026216. A prevalence of 33.33% was recorded in HBV-positive patients who had just had tattoos. This rate is highly sensitive with P-value = 0.007757. The results of this study corroborate the assertions of the WHO office in Africa on certain practices. According to the WHO, certain practices are dangerous. These include "personally dangerous" behaviors related to needle sticks, such as tattooing, piercing, needlestick injuries and injecting drug use. The reuse of gilette blades or contaminated sharp objects (nail clippers), whether in households, schools or among injecting drug users, can transmit HBV (IAHO-WHO, 2023).

The prevalence of HBV was 8.42% among women who consumed alcohol at least four times a week. This prevalence is significant with P-value = 0.051778. This prevalence is due to the change in behavior and morals. Recently, women have been storming the places of alcoholic beverage outlets every weekend. In some corners of the drinking establishments, glasses are very poorly washed and sometimes rinsed with non-potable water and placed in front of customers to be used. This could explain this prevalence in these groups of patients.

Prevalence and Factors influencing the circulation of HCV

Certain factors were associated with the increase in the prevalence of HCV and its maintenance in some patients. These associated factors were linked to the presence of a case of HCV within the family with a prevalence of 9.10%. This rate is significant with P-value = 0.0598612. This high rate could be explained by the use of certain personal objects within certain families.

Some enrolled patients claimed not to have personal kits for pedicures and manicures. Other patients claim that

these personal kits are used between close relatives. However, within these families, some members have tested positive for HCV. This is certainly what could explain this increase within families.

A proportion of 33.33% of patients claimed to have multiple sexual partners. This proportion is very significant with P-value = 0.0066266. This high prevalence is explained by the simple fact that some patients from this study claimed to have male and female condoms at their disposal which unfortunately are often kept in their wallets. This unsavory practice exposes them to HCV and possibly other sexually transmitted infections. Because these patients store these condoms very poorly. This could support the results obtained in this study.

A rate of 0.47% of HCV positive patients had piercings on the nose, lip or umbrina with P-value = 0.03361251 which is statistically significant. These results are lower than those of 19% in patients with scarifications and a prevalence of 2.5% in patients with piercings published by Mvumbi in 2022 in Canada.

A prevalence of 33.33% of HCV positive patients had tattoos. This prevalence is highly significant with P-value = 0.000333334. In a study conducted by WHO in 2023, it sounded the alarm on the danger of tattoos and piercings. Most of these beauty corners do not have an autoclave and most of the instruments are very poorly sterilized and sometimes some instruments are just flamed using a lighter. This is what would certainly increase the prevalence among these patients in this study (IAHO-WHO, 2023).

In the present study took place from January 2024 to May 2024. During this study period, we enrolled 423 patients. Among these patients, 39 patient samples were positive and 384 negative for HBV with a prevalence of 9.12% and 3 patient samples were positive and 420 negative for HCV, that is to say a prevalence of 0.71%. The average age in this study was 31.72 years with the extremes being 15 years and 45 years.

The age group from 25 years to 34 years was the most represented with a frequency of 39.72% followed by that of 20 years to 24 years with a rate of 35.22%. The shopkeepers represented 31.91% followed by the students with a rate of 17.26%. The reason for consultations was 33.33% in patients received in

emergency, 12.50% of patients were outpatients and a prevalence of 8.98% in patients in PNC.

The factors that were associated with the circulation of HBV and HCV were related to blood transfusion, the presence of a case of HBV and HCV in the breast and some had multiple sexual partners as well as the presence of scarifications, piercings and tattoos in some patients.

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Author Contributions

Naibi Keitoyo Amedé and Asbagui Faysala Oscar wrote and revised the protocol. Tchouhigbe Arnaud, Asbagui Faysala Oscar, Bechir Abdallah Fadoul, and Justine carried out the manipulations. Ngadolo Bongo Nare Richard and Naibi Keitoyo Amedé supervised the work. Naibi Keitoyo Amedé, Ban-Bo Bebanto Antipas carried out the statistical analyses. Naibi Keitoyo Ngadolo Bongo Nare Richard and Asbagui Faysala Oscar interpreted the results. All the authors contributed to the production of this document.

Ethical consideration

On the ethical level, the study was authorized by note N°1833/RT/MSPP/PN/DPSPN/DSNS/HU/SG/2024

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

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