Seroprevalence of hepatitis C virus in the urban commune of Kindia-Republic of Guinea.

Abstract

Introduction: Hepatitis C is an inflammation of the livercaused by the hepatitis C virus; its spread in humans has been boosted by the emergence of parenteral use for medicalpurposes or drug injections, as well as itsasymptomatic nature in the acute phase.

The global prevalence of hepatitis C isestimated at 1%, with a variable distribution in differentregions of the world, sometimesevenwithin the same country.

General objective: To help improve the biologicaldiagnosis and prevention of HCV infections in the urban commune of Kindia.

Methodology: The urban commune of Kindia wasused as the study area. This prospective and descriptive studywascarried out at the Institut de Recherche en Biologie Appliquée de Guinée (IRBAG) fromJune to December 2022. The biomaterialconsists of 3,000 bloodsamplestakenfrom patients attending consultations at healthfacilities. The Immuno-Enzymatic technique (ELISA) wasused to test for anti-HCV antibodies.

Results: In the course of ourwork, out of 3,000 samplestakenfrom patients admitted to healthfacilities, 78 cases tested positive for the anti-HCV antibody, representing a carriage rate of 2.6%. Femaleswere the mostaffected, with 50 positive cases (1.67%). The 31-40 age group had the highest anti-HCV antibodycarriage rate, at 0.70%.

Conclusion: All socio-professional groups are affected by this infection, but to varyingdegrees. Despiteour efforts, hepatitis C virus infection remains a major concern, as thereiscurrently no vaccine and existingtreatments are expensive and inaccessible to middle-income countries.

Key words : Virus, Hepatitis C, anti-HCV Ab, ELISA, Kindia.

Introduction

Hepatitis C is an inflammation of the livercaused by the hepatitis C virus (HCV) [WHO, 2023].

The hepatitis C virus, consideredbeforeitsdiscoveryin 1989 as non-A, non-B hepatitis, isresponsible for liverlesions of varyingseverityfrom one individual to another, and canprogressslowly to cirrhosis and thenadenocarcinoma of the liver. The question of the source of HCV infection in humans and the origin of the divergence betweengenotypesremainshighlydebated. The latestscientificdevelopmentsconcerningtheseHepaciviruses support the hypothesis of a zoonoticorigin, mostlikelyfromrodents or bats, whichdiversified in humans [Lunel F. al. 1991; Scheel TKH et *al*. 2015].

Hepatitis C virus (HCV) infection is the cause of a major burden on populations in many countries. In the 20th century, its spread in humanswaspotentiated by the emergence of parenteral use for medicalpurposes or drug injections as well as itsasymptomatic nature in the acute phase [Scheel TKH et *al.* 2015].

For the samereasons, the epidemiology of the infection remainsrelativelypoorlyunderstoodtoday. Data on the prevalence and, even more so, the incidence of HCV infection are lacking in many countries, particularly middle- and low-income countries on the African continent. Despitetheseshortcomings, global HCV

seroprevalence has been estimated at 170 million chronic carriers, or around 3% of the world's population. Africa as a wholecould.

The global prevalence of hepatitis C isestimated at 1%, with a variable distribution in differentregions of the world, sometimesevenwithin the same country [WHO, 2017].

Prevalenceis high in sub-SaharanAfrica; the onlyreviewfocusing on sub-SaharanAfricawascarried out in 2002 by Madhava et al, with an estimated 18 million individualscarrying anti-HCV antibodies [Madhava V. et *al.* 2002]. In Guinea, according to studiescarried out by Diakité F. et *al.*in 2019 in the NephrologyDepartment of the Donka National Hospitalamong patients withchronicrenalfailure, the seroprevalence of the hepatitis C virus was 4.61% [Diakité F. et *al.* 2019].

In 2021, a study of the impact of biologicaldiagnosis of parenteral viral hepatitis by S. Boumbaly et al. in the Republic of Guineashowed an HCV antibodycarriage rate of 18% [S. Boumbaly et *al.* 2021].

According to the MedicalDepartment of Livi France, 2023, the riskfactors for hepatitis C include:
- intravenous or intranasal drugusers;
- havingreceivedablood transfusion or organ, tissue or cell transplant before 1992;
- being a homosexual man
- have haemodialysis
- be an HIV carrier.

Initiallyreserved for populations at risk of infection, since 2017 systematic screening for hepatitis C has been recommended for all adultswho have never been screened. This decisionwastakenafteritwasfoundthat 30% of patients diagnosedwithhepatitis C had no risk factor.

Methods of preventing the virus

Preventionisbased on limiting transmission by :

Using condoms duringsexual intercourse.

Using single-use injection equipment for intravenousdrugusers.

Using single-use or sterileequipment for tattoos and piercings.

Not sharing toiletriesthatmay come into contact withblood: razors, nailscissors, nail clippers, toothbrushes.

Screening blood donations [Livi France MedicalDepartment, 2023].

Methodology

The urban commune of Kindia wasused as the study area. This prospective and descriptive studywasconducted at the Institut de Recherche en Biologie Appliquée de Guinée (IRBAG) fromJune to December 2022. The biomaterialconsists of 3,000 bloodsamplestakenfrom patients attending consultations at healthfacilities. The Immuno-Enzymatic technique (ELISA) wasused to test for anti-HCV antibodies.

Results

Table 1: Distribution of HCV seroprevalence in the urban commune of Kindia.

Results	**Staff**	**Percentage**
Positives	78	2.60

Negatives	2922	97.40
Total	3000	100

Out of asample of 3000 samples, 78 were positive with a carrying rate of 2.60% against 2922 negativesamples or 97.40%.

Table 2: Distribution of positive cases by sex.

Sexes	**Effectifs**	**Positive cases**	**Percentage**
Male	1160	28	0.93
Feminine	1840	50	1.67
Total	3000	78	2.60

Fromthis table, weseethat the femalesexis the mostaffectedwith 50 cases or 1.67%. On the other hand, the male sex, being the least infected, totals 28 cases for a percentage of 0.93. This discrepancycouldbeexplained by the factthatthereis more samplingamongwomen.

Table 3: Distribution of the population by age group.

Age Groups	**Staff**	**Positive cases**	**Percentage**	**$IC_{95\%}$**
1 à 10	1448	7	0.23	[0.20-0.26]
11 à 20	240	5	0.17	[0.11-0.23]
21 à 30	360	14	0.47	[0.42-0.52]
31 à 40	486	21	0.70	[0.65-0.75]
41 à 50	224	13	0.43	[0.36-0.50]
51 à 60	153	10	0.33	[0.25-0.41]
Age > 60	89	8	0.26	[0.15-0.37]
Total	3000	78	2.60	[2.58-2.62]

This table shows that people aged 31 to 40 have the highest rate of HCV antibodycarriage at 0.7%, followed by thoseaged 41 to 50, 21 to 30 and 51 to 60 with 0.47, 0.43 and 0.33 respectively

Table 4: Distribution of positive cases by socio-professionalcategory:

Professions	**Staff**	Positive cases	**%**	**$IC_{95\%}$**
Students	923	5	0.16	[0.05-0.27]
Officials	201	13	0.43	[0.36-0.50]
HealthWorkers	72	4	0.13	[0.01-0.25]
Traders	307	16	0.53	[0.47-0.59]
Military	25	5	0.16	[0.04-0.36]

Farmers	180	8	0.26	[0.19-0.33]
Without professions	1292	27	0.90	[0.87-0.93]
Total	3000	78	2.60	[2.58-2.62]

Fromthis table, we note that non-occupational patients occupy the first place in the rate of antibodycarriageagainst Viral Hepatitis C (0.90%), followed by thosewho practice commerce and civil servants with 0.53 and 0.43% respectively.

Table 5: Distribution of positive cases by healthfacility

Healthfacilities	**Staff**	**Positive cases**	**Parentage**
Kindia RegionalHospital	1300	29	0.97
ManquepasHealth Center	432	11	0.37
CaciaHealth Center	340	09	0.30
Bibane Health Center	277	10	0.33
WondyHealth Center	353	14	0.47
Kénendé Health Center	298	05	0.17
Total	3000	78	2.60

It wasfoundthat patients seen at the RegionalHospitalwere more affected by this viral diseasebecause of the greaternumber of patients and the existence of a viral infection screening centre thanhealthfacilities, with 0.97%, and the lowest infection rate wasrecorded at the Kénendé health centre (0.17%).

Discussion

In thiswork, afteranalysis by the ELISA method, 78 out of 3000 patients sampledtested positive, i.e. acarriage rate of anti-HCV antibodies of 2.6%.

This resultishigherthanthosefoundin 2021 by TAL BALDE et *al.* inGuineawhoreportedthat HCV antibodieswere detected in only one case, 0.32%.

It isalsohigherthanthosefoundin 2014 by Gower et al. inLibya (1.2%), South Africa (1.7%), Madagascar (1.2%), Algeria (1.4%), and Ethiopia (1.3%).

The same trend wasobservedin 2015 by Julien Riou et *al.* (1.5%), Mali (1.9%) and Senegal (1%).

On the other hand, ourresultislowerthanthosefoundin 2004 by Tangara Omar and Hamid Traoré in Mali with 4.9% and 4.8% respectively. Similarly, itislowerthanthosefound by Gower et *al.*in 2014 in Egypt 14.7%, Cameroon 11.6% and Nigeria 8.4%.

However, ourresultis comparable to thatobtainedin 2015 by Julien Riou et *al.*in Côte d'Ivoire 2.2%.

In the course of ourwork, itappearsthat the carrying rate for womenishigherthan for men, i.e. 1.67% compared to 0.93%. Theseresults are contrary to thosefound by Diakité F. et *al.*in 2019 with a carrying rate of 3.07% in men compared to 1.54% in women.

The same trend wasfound by S. Boumbaly et *al.*in 2021 with 19.06% in males versus 15.75% in females.

According to age groups, ourresults show thatseroprevalenceispredominantamongadults (0.70%) for the 31 to 40 age group followed by the 21 to 30 age group (0.47%). Our results are significantlylowerthanthosefound by Kalla N. et *al*. in 2020 whoindicatedthat the 60-69 age group is the mostaffectedwith 40.70%, the seroprevalence in thisage group is 12.79% [Kalla N. et *al.*in 2020].

Conclusion

In the course of ourwork, 3000 patients received for consultation in healthfacilities in the urbanmunicipality of Kindia weresampled. Afterdiagnosis by ELISA, 78 cases were positive, i.e. an anti-HCV antibodycarriage rate of 2.6%. The predominance of viral hepatitis C seroprevalenceisfemale in the urban commune of Kindia with 1.67%.

Patients between 31 and 40 years of age have the highest rate of HCV antibodycarriage at 0.70%.

It appearsthat all socio-professionalstrata are affected by this infection, but to differentdegrees; The mostaffectedamongthem are patients who do not have a definedprofessional situation, followed by thosewhowork in commerce with 0.90% and 0.53% respectively.

Despite efforts, hepatitis C virus infection remains a major concern as no vaccine exists to date and existingtreatments are expensive and very inaccessible for middle-income countries.

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