Trends in General Medicine

Seroprevalence of Hepatitis C Virus among Patients and Voluntary Blood Donors in A Teaching Hospital in South East Nigeria

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ABSTRACT

Background: Hepatitis C Virus is a major human pathogen infecting lots of individuals worldwide with increasing risks of chronic liver diseases. Hepatitis C viral infection affects people of all ages, races and gender causing both acute and chronic inflammation of the liver. It is responsible for most cases of liver transplantation in US and Britain. Blood testing is one of the reliable methods in use to diagnose Hepatitis C virus to detect the presence of antibodies to HCV, using an enzyme immunoassay.

Aim: Was to determine the prevalence of Hepatitis C Virus among patient and voluntary blood donors who presented at David Umahi Federal University Teaching Hospital Uburu in Ohaozara LGA, Ebonyi State.

Methodology: Blood samples were appropriately collected from the subjects and screened for Hepatitis C Virus infection using the antibody (Ab) rapid test kit (an enzyme immunoassay technique).

Result: A total of 93 patients and blood donors were tested for hepatitis C virus infection, comprising of 52 (55.9%) female and of 41 (44.1%) male gender. Out of 93 patients tested over the period of 6 months, 2 (2.2%) were hepatitis C virus positive giving a period Sero-prevalence rate of 2.2% with no significant difference in prevalence among gender and age of participants.

Conclusion: There is urgent need to take public health measures seriosly to reduce disease burden and transmission, by routine screening of all for HCV infections and health education campaigns to people on the dangers associated with HCV infection.

Introduction

Hepatitis C virus infection is a serious health problem in both developed and developing countries [1]. Hepatitis C virus is a spherical, single stranded enveloped hepatotropic RNA virus that belongs to flaviviridae family [2,3]. Route of transmission is parenteral, vertical and sexual, as well as transfusion of unscreened or improperly screened blood or blood products. Other means of transmission may include the sharing of skin piercing objects such as needles, clippers, razor blades, toothbrushes and inadequate sterilization of medical equipment. Hepatitis C viral infection affects people of all ages, races and gender causing both acute and chronic inflammation of the liver. It is responsible for most cases of liver transplantation in US and Britain [4]. HCV infection may be self-limiting or progress to fulminant hepatitis. Although 80% of hepatitis C virus persons may remain asymptomatic and about 15-35% of the infected cases resolve spontaneously in a self-limiting manner within 6 months of infection without treatment, the remaining 65-85% progresses to chronic irreversible liver damage, which brings to the limelight, the clinical importance of this infection. While 20% of the infected persons may develop liver cirrhosis and fibrosis, 20% also may progress to hepatocellular carcinoma. The risk of cirrhosis of the liver is 15-30% within the age of 20 years [5]. Hepatitis C virus (HCV) was formally referred to as non-A, non-B hepatitis (NANBH) after the invention of serological test for viral hepatitis A and B in 1965 and 1973 respectively, until in 1989 when the agent was named by Choo and his co-worker [4]. This virus is an RNA known viral pandemic disease of public health concern to infect both chimpanzees and humans, therefore causing similar disease in these species [6]. HCV is four times more infectious than Human Immunodeficiency Virus (HIV). Blood testing is typically used to diagnose Hepatitis C virus by detecting the presence of antibodies to HCV, using an enzyme immunoassay [7,8]. HCV requires less exposure than HIV to cause infection [9]. If this test is positive, a confirmatory test is then performed using immunoassay. A recombinant immunoblot assay is used to verify the immunoassay and the viral load is determined by using polymerase chain reaction (PCR) to detect HCV RNA. If there is no RNA and the immunoblot is positive, it means that the person tested had a previous infection but cleared it either with treatment or spontaneously; if the immunoblot is negative, it means the immunoassay was wrong [7]. It takes about 6–8 weeks following infection before the immunoassay will test positive.

In Nigeria no study has been conducted to determine the national prevalence of HCV disease. However, various population studies conducted in subgroups like anaemic patients and blood donors show divers prevalence rates. Approximately 3% of the world's population are living with chronic hepatitis C [10,11] and more than 350,000 people die every year from HCV related liver diseases [12]. In Africa, the prevalence of HCV is between 0.1% and 17.5%. However, the prevalence of HCV for the general population is not clear. A prevalence of 4.9% was estimated in a 2011 study [13], but a recent review by Karoney and Siiki indicates that this figure could be an underestimation [14]. This is because of challenges such as barriers to screening, cost-related factors, and inadequate knowledge and awareness of hepatitis C [15]. There are many risk factors of acquiring HCV infection. In the Sub-Saharan Africa, practices such as dental surgery, therapeutic injection, intravenous drug, and age have been reported as major risk factors associated with HCV infection [16-18]. In Nigeria, the infection rate is seen to be heterogeneous; increased in some states and localities while declining in others. A 0.3% was reported in Lagos, 4.7-5.0% in Ilorin, 5.3-6.6% in Enugu, 11% in Ibadan and 20% in Benin [19]. There are 7 HCV genotypes and 67 subtypes identified so far. Studies have confirmed that the predominant HCV genotypes in Nigeria are genotypes 1, 2, 4 and 5 [20,21]. Genotype 3 is found in South Asia, genotype 4 in central Africa and the Middle East, genotype 5 and 6 are predominant in South-East Asia and the Northern region of South Africa. Adolescents who exhibit rapid physical and emotional development as well as sexual maturation are more exposed to HCV infection and other sexually transmitted disease due to their increasing sexual adventure, risky behavioral practice, amongst others. HCV infection still poses a challenge of public health concern in developing and underdeveloped countries where poor standard of living, poor awareness campaign and ignorance, as well as superstitious beliefs, have beclouded the people's perception of the disease. In addition to these challenges, is the unavailability of vaccines due to the mutability of the virus genome [4].

In Ebonyi State, the exact risk factors of HCV infection are not clear, a study by Victor et al., [4] aimed at determining the seroprevalence of HCV among students in Ebonyi State University reported 4.5% prevalence in males and 5.9% in females with an overall seroprevalence of HCV to be 5.2%. It was also discovered that married people were more exposed to the virus compared to the singles with a prevalence of 6.0% to 5.1% respectively. Also, from the pediatric department of Federal Teaching Hospital Abalakili Ebonyi state shows a study of the prevalence of hepatitis C infections in children infected with HIV where a total of 88 children between the ages 2-17, with a low prevalence rate of 1.1%. The only patient with HIV/HCV co-infection was a male adolescent in a severe immunodeficiency stage of the disease [20].

There are effective treatments for hepatitis C, the goal of treatment is to cure the disease and prevent long-term liver damage. Antiviral medications, are mostly used to treat hepatitis C. Some people's immune system can fight the infection on their own while new infections do not always need treatment. Treatment is always needed for chronic hepatitis C. Hepatitis C medication is direct-acting antiviral (DAAs). Most DAAs treatment are expensive and in Africa where most people are of very low socio-economy class, the access to these DAAs are difficult thereby the spread increasing on a high side. There is therefore need to study and provide more data that will guide policies relating HCV in Ebonyi State.

Problem Statement

In Uburu of Ohaozara LGA in Ebonyi state where Dufuth is situated, there is no data on the prevalence of HCV among blood donors

and hospital patients respectively, hence the need for this study.

Aim

The aim of this study was to determine the seroprevalence of Hepatitis C Virus in hospitalized patients and voluntary blood donors who visited David Umahi Federal University Teaching Hospital, Uburu, Ohaozara LGA, Ebonyi State from November 2022- June 2023.

Objective

1. To assess the HCV sero-positivity among male and female patients and blood donors
2. To assess the HCV sero-positivity across the age groups
3. To determine the age and gender distribution among patients and blood donors in DUFUTH.

Literature Review

Distribution and Disease Burden

HCV prevalence appears to have increased in occurance with advancement in age. The estimated prevalence of HCV in Africa is 5.83% [21] with ages 40 and above recording the highest frequency. On HCV morbidity and mortality in Africa, 1.6% infected HCV patients who develop chronic Liver disease progresses to Hepatocellular carcinoma with mortality rate greater than 80% [22].

Transmission

Blood transfusion is a major way of acquisition of HCV infection through inconsistent screening procedures for blood donors. 17% high HCV prevalence in sickle cell patients is an evidence especially someone who has received multiple blood transfusions [23]. In sub-Saharan Africa WHO estimated approximately 18% of injections are administered with unsterilized needles or reused syringes which increase risk of transmission through unsafe injection practices [24].

Risk Factors and Transmission

• **Perinatal Transmission**

Caesarian operation is an anticipated risk [24]. Transmission of blood borne pathogens occurs in the procedures like child delivery as the interior organs are exposed which makes a person more susceptible to various infections [25]. It has been documented that a caesarian operation is a principal element in Afghan refugees accommodating the slum areas which had infected female employees [26]. Such scenario might also be presented in other developing countries.

• **Syringes Recycled**

Reuse of utilized medical syringes in healthcare workers and health centres in developing countries, is frequent among people and families with low socio-economic status. In such families their children are normally involved in hospital waste and junk recycling marketing which is a threat of infection [27]. During 2007-2008 nationwide health survey, it was estimated that 86% of women acquire last injection from unopened packs [28].

• **Sexual Transmission**

Hepatitis can be transmitted through sexual means. Studies performed has concluded that sexual transmission is a mode transmission. Sexual affairs and unprotected sex with partners are major causes of spread [29]. Extramarital affairs can also be one of the risk factors for viral hepatitis [30]. Homosexuality is also substantially associated with the elevation of the disease [31].

• **Barbers**

Barbers are identified as the most likely source of HCV transmission. Inadequate barber hygiene practices can spread HCV to clients. Razor blades can sustain the virus for a few days [31]. Unsterile blades and razors, contaminated with virus-containing blood can profoundly transmit it to another person. Barbers are declared as the prime risk in HCV dispersal by a number of researchers [30]. It is confirmed that barber confer considerable prevalence rates and about 17.9%–24.7% prevalence rate was documented by some studies. Another study mentioned 58.6% risk among barbers [30]. Barbers' awareness and familiarity with viral hepatitis was also accessed in some studies. Hepatitis is enlightened as the liver disease and unhygienic razors are the prime cause of their dissemination by only 13% research. An intervening study from Islamabad documented that ample degree of awareness exist among people regarding the dissemination of viral hepatitis. More than 90% of the participating individuals had knowledge about the spread of HCV infection via reused blades [30]. Comparing the level of awareness between rural and urban regions, it was found that acquaintance and knowledge was about 92% in urban regions whereas it was 68% in rural regions [32].

• **Intravenous Drug Users**

Intravenous drug in several developing countries is the prime risk factor to spread this viral disease [30]. Third phase is icteric phase where the individual become obviosly jaudiced.

• **Nose and Ear Piercing**

They are at a greater risk for imparting the disease [30]. Blood borne pathogens are disseminated via the activities that could lead to blood wounds or seepage. In developing countries, females tend more toward ear and nose piercings. A study had reported 11.7% occurrence of hepatitis due to ear and nose piercings [30]. Usually, unsterilized instruments are being used by the people who do ear and nose piercings.

• **Surgical Procedures**

Dental surgeries also involve procedures, for instance, use of unsterilized tools that can aid in disease spread [33]. Dental surgeries integrate techniques that are prone to needle stick wounds and incur a high probability of the blood infections [34]. Other surgeries are also risk factors for viral turnover. Some causes of disease dispersal include inadequate prerequisites for blood, blood-related products, and the inexperienced conduct of the clinicians during surgeries [35].

• **Healthcare Workers**

Two studies have reported the incidence of 3.41% and 4.13% as the HCV incidence among the healthcare employees and it was found

to be maximum. Viral hepatitis is detected in all the population groups, but it predominates in a few peculiar groups, which are known as the high-risk groups.

• **Transfusion of Blood Contaminated Products**
Blood donation and transfusion are the two main risk factors that disseminate blood borne pathogens and this is considered proficiently a threat factor for HCV [33,34]. For example, patients with hemodialysis and thalassemia are at high risk [36].

• **Vaccinators**
In the course of vaccination, virus dispersal can happen from contaminated to uninfected individuals [34]. As vaccinators are engaged in a lot of vaccination projects which comprise the employment of injections, they could be a possible risk factor for viral dispersal.

• **Prevalence**
Between 0.1% and 17.5%, ranges the prevalence of HCV in the general population in Africa depending on the country. The countries with the highest prevalence include Egypt (17.5%), Cameroon (13.8%) and Burundi (11.3%). The countries with the lowest prevalence include Zambia, Kenya, Malawi and South Africa [24].

• **Risk Group**
High risk populations include: Intravenous drug users; HIV-infected; patients on hemodialysis; patients with history of blood transfusions or organ transplantation; health care workers after needle stick injuries; children born to HCV infected mothers. Also, sexually active adults with multiple partners have higher prevalence rates. Available data on HCV reveal high prevalence in patients with hepatocellular carcinoma or chronic liver disease: (Burundi; 55%, Rwanda; 45.7%) and sexually transmitted diseases (Ethiopia; 38.2%). Countries with low HCV prevalence in high-risk groups include Zimbabwe (1.3%) and Kenya (1.7%) [24].

• **Genotypes**
There are 11 HCV genotypes: 1-11, with many subtypes: a, b, c, and about 100 different strains: 1,2,3 based on the sequence of the HCV genome [49]. Genotypes 1-3 are widely distributed globally, with genotypes 1a and 1 b accounting for 60% of infections worldwide. Genotype 4 is characteristic for the Middle East, Egypt and Central Africa. Genotype 5 is almost exclusively found in South Africa [24].

• **Disease progression**
Few data are available on natural history and progression of HCV infection in Africa. Acute infections and less advanced stages of chronic disease are clinically silent. HCV is often first diagnosed in late stage when the therapeutic options are already limited. Due to slow and silent onset, many patients are unaware of their infection and at least 40% cases remain undetected [51]. Chronic hepatitis C is difficult to assess, because it is frequently subclinical. Patients with chronic hepatitis C are at risk of cirrhosis and hepatocellular carcinoma and their contacts at risk of acquiring the infection through exposure to the virus. The risk of developing cirrhosis ranges from 5% to 25% over periods of 25 to 30 years [30].

Diagnosis of HCV
Diagnosis alludes to determining the type of disease or other problems by looking at signs and symptoms. Two major categories of tests are used to diagnose HCV. These tests include serological assays and molecular assays. For detection and quantification of HCV genome, molecular assays are being used, and antibody titer against HCV is determined by serological assays.

Serological Assays
Hepatitis C is diagnosed using the HCV Antibody test. The enzyme immunoassay (EIA) is used to detect antibodies against the HCV in the patient's blood or serum, and its third generation provides 99% accuracy. The results of this test do not indicate whether the infection is acute, chronic, or resolved. After the detection of antibodies, further confirmation of the virus should be done with the help of an HCV RNA test.

The most common examples of serological assays are:
1. Screening Tests for anti-HCV. Its common example is Enzyme Immunoassay (EIA)
2. Supplemental Tests. Example: Recombinant Immune Blot Assay (RIBA)

For the detection of anti-HCV, three generations of tests have been developed up till now and each one is more advanced and sensitive than the previous one. Antigens from the HCV core, nonstructural (NS) 3, NS4, and NS5 genes are involved in Enzyme Immunoassay 3 and Recombinant Immune Blot Assay 3.

Molecular Assays
The most reliable method of HCV detection is to use polymerase chain reaction (PCR) to detect HCV nucleic acid (RNA) in the patient's plasma or serum. It is well established that qualitative assays are more sensitive than quantitative assays. With sensitivities of 10–50 IU/mL, PCR and transcription-mediated amplification (TMA) assays have rendered qualitative assays simpler and more precise. The most sensitive HCV PCR assay currently available has a sensitivity of fewer than 100 copies of HCV RNA per milliliter of plasma or serum.

The two main methods for determining HCV RNA levels are:
Qualitative HCV RNA
The qualitative HCV RNA tests give an all or none answer, indicating whether or not the virus is present in the patient's body. The amount of virus in the patient's body is not indicated by this test.

Quantitative HCV RNA
The quantitative HCV RNA test determines how much HCV is present in the body. This test will also tell you whether your infection is acute or chronic [30].

Treatment
Patients with chronic hepatitis C are given antiviral therapy

except for those patients who have co-morbidities. Treatment for HCV is increasingly improving and is successful. According to the Canadian Agency for Drugs and Technologies in Health (CADTH), treatment of HCV with interferon-free direct-acting antiviral agent–based therapy is successful against all stages of fibrosis [30].

Pre-Treatment Assessment of Patients
Questions regarding the patient's life after antiviral therapy, as well as other factors such as the duration of infection, signs, and symptoms of disease, and the existence of cofactors that can intensify disease (e.g. alcohol, obesity, co-infections), are asked before treatment. To confirm the amount of HCV RNA and its genotype, pre-treatment tests are done, and these tests involve liver biochemistry and function, abdominal ultrasound, fibrosis stage assessment, and tests to rule out co-infections. A pre-treatment liver biopsy is not mandatory but may be helpful in patients with normal transaminase levels, particularly those with a history of alcohol dependence, in whom little correlation may exist between liver enzyme levels and histologic findings [24].

Treatment Routines
Patients who have never received HCV medication are treated for different periods of time in weeks, depending on the genotype of the HCV.

Post-Treatment
Patients who do not reveal any more signs and symptoms of the virus do not require post-treatment, although those with alanine aminotransferase elevation or constant risk exposures (e.g. people who inject drugs) should have annual HCV RNA testing. Patients with cirrhosis and who have had a viral response should be screened for hepatocellular carcinoma regularly. Cirrhosis patients need hepatocellular carcinoma with biannual ultrasound before treatment. Rescue treatment should be provided to patients who have not responded to the viral treatment. Patients who do not get a viral response due to adherence problems or drug-drug interactions should be treated with caution. For 12 weeks, a single-tablet regimen of Sofosbuvir, Velpatasvir, and Voxilaprevir is effective against all genotypes of HCV [37]. All patients with chronic hepatitis C infection should be considered potential candidates for drug therapy [34]. Treatment is recommended for patients who are at risk of developing cirrhosis, generally defined by a measurable hepatitis C RNA level and liver biopsy showing portal or bridging fibrosis along with moderate inflammation and necrosis. Treatment is also recommended for patients with elevated serum ALT levels who meet the following criteria:

1. Willingness to be treated and to adhere to treatment requirements.
2. Age >18 years.
3. Positive HCV antibody and serum HCV RNA test results.
4. Compensated liver disease (e.g., no hepatic encephalopathy or ascites).
5. No contraindications for treatment.
6. Acceptable hematologic and biochemical indices. For examples hemoglobin levels [24].

Prevention Strategies
Primary prevention activities include: screening and testing of blood, plasma, tissue, organ and semen donors; virus inactivation of plasma derived products; risk reduction counseling services and implementation of infection-control practices. Secondary prevention activities include identification and testing of persons at risk and management of infected persons [24].

Symptoms of HCV infection
Fatigue, nausea, vomiting, abdominal pain under lower right ribs, pale stools, decreased appetite, low-grade fever, dark urine, joints pain, yellowing of skin and the sclera (jaundice) and tickling sensation are the most recurrently perceived symptoms. Symptoms of the HCV are categorized into three phases discussed below.

The prodromal phase
Some patients feel sickness, which includes fever, arthralgia, arthritis, rashes, and angio-neurotic edema before the proper disease development. These symptoms end before jaundice, which is the most common and peculiar symptom of HCV.

Pre-icteric phase
In this phase, the patient develops respiratory problems and gastrointestinal tract disorders which may include malaise, fatigue, myalgia, nausea, and vomiting, which may be escorted by weight loss, headache, coryza, fever, or pharyngitis and cough. The pre-icteric phase lasts from 2–3 days to 2–3 weeks [30].

Methodology
Setting
The study is carried out at David Umahi Federal University Teaching Hospital (DUFUTH), Uburu in Ohaozara LGA of Ebonyi State. Ebonyi State has a total population of 2,173,501 people who are predominantly of Igbo tribe.

Study Design
The study is a retrospective hospital based research work carried out on hospitalized patients and blood donors who attended David Umahi Federal University Teaching Hospital (DUFUTH), Uburu in Ohaozara LGA of Ebonyi State from November 2022 to June 2023.

Ethical Approval
Ethical approval was obtained from the Research and ethical committee of David Umahi Federal University Teaching Hospital Uburu, an approval was obtained in November 2022 to conduct the research.

Sample Collection
Blood Samples were collected from all the patients suspected of symptoms of hepatitis C infection (include fatigue, jaundice, dark urine, anorexia, fever malaise, nausea and constipation varying on severity and chronicity of infection) as requested by the attending physician and from all blood donors in David Umahi federal university teaching Hospital Uburu. All relevant data were extracted from the Hematology and Blood transfusion department

of David Umahi Federal University Teaching Hospital, Uburu, Ebonyi State. These patients visited the Teaching Hospital between November 2022 and June2023.

Laboratory Processing and Samples
Blood samples were collected into plain bottles and blood was allowed to clot for 20 minutes at room temperature. The samples were centrifuged to obtain sera at 100g for 10 minutes. Immuno chromatographic (IC) strips were used to test for HCV antibody. Strips that produced double bands (test and control) were recorded positive while those that produced only a single band (control) were recorded negative.

Data Analysis
Data was analyzed using the statistical package for social sciences (SPSS) software version 26.0 and presented as percentages and frequencies. The Pearson's chi-square statistical analysis was used to compare the results. The level of statistical significance was achieved with p= 0.756 (p<0.05 is the significance determining index).

Results
General Overview
A total of 93 patients and blood donors were tested for hepatitis C virus infection, comprising of 52 (55.9%) female and of 41 (44.1%) male gender. Out of 93 patients tested over the period of 6 months, 2 (2.2%) were hepatitis C positive giving a period Sero-prevalence rate of 2.2%.
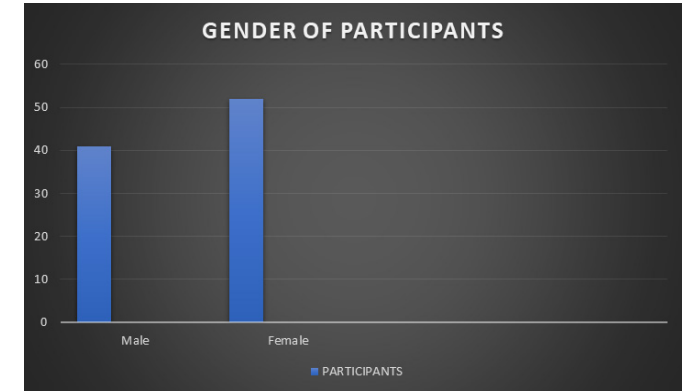

Figure 1: Gender distribution among participants.

Age and Sex Distribution
The age range of the participants ranges from 17 years to 93years respectively for both males and females. The overall mean age standard deviation was 36.6 +/-13.5. The mean age for males was 39.32 whereas among females it was 34.52. See table 1.

Table 1: Socio-demographic characteristics of respondents.

Variable	Frequency (N =93)	Percent (%)
Age in years		
18 - 24 years	12	12.9
25 - 34 years	36	38.7
35 -44 years	29	31.2
45 - 54 years	6	6.5
55 - 64 years	2	2.2
65 years and above	8	8.6
Mean SD	36.6 13.5	
Gender		
Male	41	44.1
Female	52	55.9

Prevalence of HCV
Out of 93 patients tested over the period of 6 months, 2 were hepatitis C virus positive giving a Sero-prevalence rate of 2.2%. see Figure 2.
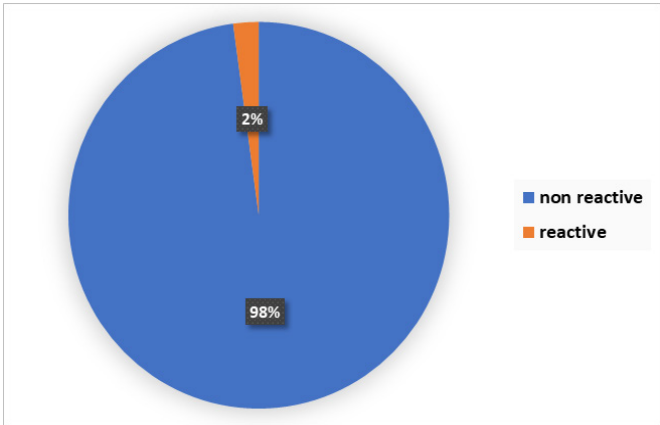

Figure 2: Hepatitis C Virus sero-prevalence among participants.

Prvalence in Relation to Socialdemographic Characteristics of Participants
Out of the 41 males tested, 1 (2.4%) was seropositive for hepatitis C virus. Similarly, out of the 52 females tested, 1 (1.9%) was seropositive. The difference was not statistically significant ($\chi2$ = 0.029 and p =1.000). The distribution of HCV infection rate according to age groups was seen in the table 2. The result shows that the prevalence rates were 8.3% and 2.8% in the age bracket 18-24 years and 25-34 years respectively. The difference was not statistically significant (χ^2 = 2.236 and p= 0.756).

Table 2: Relationship between socio-demographic characteristics and Hepatitis C Virus.

Variable	Laboratory Result Frequency (%)		Test statistics	P-value
	Reactive	Non-reactive		
Age in years				
18 - 24 years	1 (8.3)	11 (91.7)	χ^2 = 2.236	0.756
25 - 34 years	1 (2.8)	35 (97.2)		
35 -44 years	0 (0)	29 (100)		
45 - 54 years	0 (0)	6 (100)		
55 - 64 years	0 (0)	2 (100)		
65 years and above	0 (0)	8 (100)		
Gender				
Male	1 (2.4)	40 (97.6)	χ^2 = 0.029	1.000
Female	1 (1.9)	51 (98.1)		

Discussion

It is well established that HCV is of global importance affecting all countries across the globe leading to a major global health challenge that requires widespread active interventions for its prevention and control [13]. The prevalence of HCV in relation to gender in this study shows no significant differences as equal prevalence was recorded for both male and female gender. This conforms with previous work done in Delta Nigeria, Egypt and Brazil [38-40] where equal gender distribution with HCV infection among studied population was recorded. On the contrary, findings by Hamza et al. [41] in the north western part of Nigeria recorded higher prevalence in males than females.

Hamza et al. however, noted that females in the northern part of Nigeria are very conservative due to their religious beliefs which could be responsible for the low prevalence in the female gender than the male gender, unlike in the southern part of the country where females are more liberal in freedom and religion. Females in southern part of Nigeria also involve in activities like injecting drug and smoking with the usage of pipe which are means by which the virus can be transmitted coupled with other factors such as the usage of unsterilized aesthetic body piercing which is common among female gender than in the male gender. Moreso, nosocomial transmission is also common among females in the south since women attend hospital more than men for various reasons. Hence it appears female tend to be more predisposed to the virus than the male in southern and eastern part of Nigeria when compared with northern counterpart.

A Sero-prevalence rate of 2.2% of HCV was found among hospitalized patients and blood donors in David Umahi federal university teaching hospital, Uburu within the study period and among the study population. This finding is quite similar with prevalence recorded in most parts of Nigeria and southeast as well, however, the epidemiology and burden of HCV infection varies throughout the world, with country-specific prevalence ranging from <1% to >10% [13]. Globally, 130 to 150 millions people are estimated to have HCV infection with an infection rate of 3.4 million yearly. Africa has overall prevalence rate of 2.9%, which is slightly higher than 2.5% global prevalence [4]. However, some few African countries like Ethiopa and Rowanda are said to have high prevalence that could be as high as 4.3% and 16.0% in [4], this is not wide spread and only occur is some few African countries. Tropical Latin America, and North America have prevalence as low as <1.5% [11]. In overall, finding across Africa and most world prevalence is in agreement and fall within similar range as that of this research.

In Nigeria, the infection rate is seen to be heterogeneous with increase in some states and localities while declining in other areas. A 0.3% was reported in Lagos, 4.7-5.0% in Ilorin, 5.3-6.6% in Enugu, 11% in Ibadan and 20% in Benin respectively [4]. A sero-prevalence of 5.2% was observed among the students of Ebonyi State University. Out of 1120 students recruited for the study, 4.5% of HCV was recorded among male students while 5.9% was recorded among the female students respectively [4]. The 'patchy' epidemiological situation in some areas will continue to complicate the task of the establishment of global, regional and national data base [13] which the challenge we currently face in reportage of HCV infection in Nigeria. An estimated 2%-3% of the world's population is living with hepatitis C virus (HCV) infection, and each year, >350 000 die of HCV-related conditions, including cirrhosis and liver cancer. In contrast to the United States and other developed countries, HCV transmission in developing countries frequently results from exposure to infected blood in healthcare [13] and indiscriminate sexual practices. Hepatitis C prevention, care, and treatment programs must recognize country-specific epidemiology, which varies by setting and level of economic development. Awareness of the global epidemiology of HCV infection is important for healthcare providers treating foreign-born patients from countries where HCV infection is endemic and for counseling patients who travel to these countries. Countries with a high burden of HCV infection also would benefit from establishing comprehensive prevention, care, and treatment programs [15]. Interestingly, the global epidemiology of hepatitis C demonstrates a predominantly declining prevalence of the diseases. The transmission of hepatitis C has been greatly impacted by mandatory screening of blood donors in most countries in the world, although intravenous drug use continues to be a major source of infection. Public education regarding the risks of exposure to infected persons as well as household items such as razors is necessary in the continuing effort to curb the incidence of HCV [9]. Adolescents who exhibit rapid physical and emotional development as well as sexual maturation are more exposed to HCV infection and other sexually transmitted disease due to their increasing sexual adventure, risky behavioral practice, amongst other. It suffices to know that HCV infection may be self-limiting or progress to fulminant hepatitis. Although 80% of hepatitis C virus patients may remain asymptomatic and about 15-35% of the infected cases resolve spontaneously in a self-limiting manner within 6 months of infection without treatment, however, 65-85% may progress to chronic irreversible liver damage, which brings to the limelight, the clinical importance of this infection. About 20% of the infected patients may develop liver cirrhosis and fibrosis, 20% also may progress to hepatocellular carcinoma. The risk of cirrhosis of the liver is 15-30% within the age of 20 years [4]. However, the assessment of the national HCV prevalence and transmission modes should be completed to enable national authorities to prioritize preventive measures and to make the most appropriate use of available resources. There is an urgent need for more accurate Information on the costs and burden of HCV to society. Twenty-one years after the discovery of HCV, the assessment is far from being complete and little progress has been made in the past 10 years in many countries. In some countries significant increases have been reported and this may also apply to countries where insufficient data exist. A safe and efficient vaccine against HCV is urgently needed [13].

Conclusion

Hepatitis C Virus infection is a growing health challenge in Nigeria in the setting of poor knowledge, inadequate screening

facilities, and expensive treatment. All stakeholders should work towards improved awareness, testing for hepatitis C and advocacy for affordable care. Therefore, there is urgent need to take public health measures to reduce disease burden and transmission, by routine screening of all HCV infections and also government should provide health education campaigns to people on the dangers associated with HCV infection.

Limitations

Poor documentations of patient results and biodata also affected the statistical power of the study.

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