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PREVALENCE OF HEPATITIS C VIRUS INFECTION AMONG PEOPLE ATTENDING A VOLUNTARY SCREENING CENTRE IN MASAKA, NASARAWA STATE, NIGERIA

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ABSTRACT

Hepatitis C virus (HCV) is an emerging public health problem in Nigeria. This study therefore determined the seroprevalence of this virus among people of a rural settlement in Nigeria during which 600 people were screened for HCV infection. Five ml of blood was collected from each participant, the serum harvested and screened for anti- HCV using a Chromatographic rapid test kit (ACON Inc. USA) according to the manufacturer's instructions .The overall prevalence of HCV infection in this population was 24.2% being higher among males (23.7%) than females (23.7%) (p 0.05). Only Educational level had a significant association with infection ($p < 0.05$). When stratified by age infection was highest among those aged 21 -30 years (27.4%) and least among those aged 51 years and above (3.6%) (p 0.05). Occupation and marital status also had no statistically significant relationship with viral infection. The 24.2% infection rate reported in this population is a cause for alarm because it means there is a high viral reservoir in the area. There is also a high number of persons likely to have end-stage liver diseases among these participants. The absence of identifiable risk factors is a major challenge to prevention and control and demonstrates the need for reevaluation of transmission routes in the locality. Screening should be available and affordable.

Keywords: HCV, Anti- HCV, Prevalence, Masaka, Nigeria.

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Contribution/ Originality

This study has contributed in documenting the prevalence of the infectin in Masaka, Nigeria using chromatographic rapid test kit and has used the Chi square statistical test. The study is one of the very few studies which have investigated the prevalence of HCV infection in North Central, Nigeria. This paper has contributed in logical analysis and in estimating the prevalence and risk factors of the infection in Masaka. The study documented a relatively high overall prevalence of the infection. It is associated with educational level and not associated with age, gender, occupation and marital status.

1. INTRODUCTION

Hepatitis C virus (HCV) is a single stranded positive sense RNA virus of the Flaviviridae family [1-3]. This virus has a high level of sequence heterogeneity, but based on sequence homology, 6 major genotypes and many distinct subtypes have been identified [3]. Interestingly, humans and Chimpanzees are the only species vulnerable to this viral infection [2].

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HCV infection is an emerging public health challenge. Generally, its infection leads to hepatitis in 20% cases, chronic hepatitis in 50 – 80% cases of which 10 – 20% develop liver cirrhosis and 1.5% develop liver cancer 20 – 30 years after infection [4]. Anti-HCV is the serological marker in serum for HCV infection although its absence does not foreclose infection [5]. It is a sign of previous and current infection that does not differentiate acute from chronic infection [6]. A spontaneous clearance of the viral infection is reported to occur in 15 – 45% HCV infected persons [7]. In view of this, World Health Organization posits that polymerase chain reaction based diagnosis should be the algorithm of choice so as to distinguish active infection from resolved past infection [8].

Presently, there are about 150 million people chronically infected with the virus [8, 9] and 350,000 deaths occur each year due to HCV related conditions [6]. It is reported to be endemic in Nigeria with a National prevalence 3.6 - 5% [10] and known to be commonly transmitted during unprotected sex, transfusion of infected blood, occupational injury, sexual activities, scarification and vertical transmission (51%) [10, 11].

The present study was therefore aimed at determining the prevalence of HCV and probable risk factors among a rural population with a view to providing interventions.

2. MATERIALS AND METHODS

2.1. Study Population

The Cross sectional study was carried out among people of Masaka, a rural community in the outskirts of the Federal Capital of Nigeria. These were people that wanted to know their HCV status. The study took place from November 2014 - April 2015 at a voluntary screening center.

Six hundred participants of various ages and both sexes were recruited for this study. Their socio-demographic information was obtained by oral interview before sample collection.

2.2. Sample Collection and Screening for Anti – HCV

About 5ml of venous blood was collected from the participants by venipuncture into clean tubes, allowed to clot and centrifuged at 3000rpm for 5 minutes. The resultant sera were harvested into labeled cryovials and stored at -20^{O}C until ready to use.

The sera were tested for Anti-HCV using a rapid HCV test strip kit (HCV one step strip ACON Laboratories Inc. USA). The test procedure and results were carried out and interpreted according to the manufacturer's instructions.

2.3. Statistical Analysis

Data was analyzed using SPSS version 16.0. Chi square was used to determine the level of association between variables and prevalence. A p-value of ≤ 0.05 was accepted as significant.

3. RESULTS

There were six hundred participants in this cross-sectional study. Of these, 57.8% were males and 42.2% were females. The gender specific prevalence of HCV infection in the study population was higher in males (24.5%) than females (23.7%) while with respect to age it was highest among those aged 21 – 30 years and least in those aged 51 years and above ($p > 0.05$). Infection was not associated with marital status.

When stratified for occupation, the artisans had the highest rate of infection (34.5%) while those with a non-formal education had the highest prevalence of infection (41.0%). All the putative risk factors except education were not significantly associated with HBV infection in this study.

Table-1. Prevalence of HCV infection with respect to risk factors among patients visiting a voluntary screening centre in Masaka, Nigeria

Risk factors	No. Tested	No. Positive	% Infected	p value
Sex				
Male	347	85	24.5	
Female	253	60	23.7	
				> 0.05
Age (years)				
≤ 20	140	33	23.6	
21-30	270	74	27.4	
31-40	128	30	23.4	
41-50	34	7	21.0	
≥ 51	28	1	3.6	
				> 0.05
Occupation				
Unemployed	162	37	22.8	
Civil Servants	62	13	21.0	
Trading	132	32	24.2	
Artisans	29	10	34.5	
Students	175	44	25.1	
Professionals	30	6	20.0	
Others	10	3	30.0	
				< 0.05
Level of education				
Non-formal	122	50	41.0	
Primary	111	25	22.5	
Secondary	237	42	17.7	
Tertiary	130	28	22.0	
				> 0.05
Marital Status				
Single	290	79	27.2	
Married	310	66	21.3	
				> 0.05

Source: Pennap, et al. [12]

4. DISCUSSION

More often than not, HCV infection is diagnosed accidentally, therefore it remains highly under-diagnosed. The prevalence of this viral infection among the 600 participants as determined using its surrogate, anti- HCV was 24.2%. This is much higher than the 3.6 – 5.0% as estimated for Nigeria by a meta-analysis [10]. It is also higher than results of any known published study in Nigeria. Similar studies in Nigeria among apparently healthy participants have reported 13.2% [12] 20.8% [13] 0.7% [9] 3.0% [11] 1.7% [14] 12.5% and 2.7% in rural and urban populations respectively [15]. On the international scene, there are reports of 1.5% in Morrocco [16] 4.0% in Turkey [17] and 0.3% in Cameroun [18]. In the same category as the previous group are prospective blood donors in whom HCV prevalence has been reported as 3.4% [19] 1.8% [20] and 2.1% [21].

Hospital based studies have also reported prevalence rates of 2.7% [2] 6.0% [22] and 4.7% [23].

Interestingly, Socioeconomic status has been noted as a good indicator of low awareness of viral disease transmission [24]. Although this index was not measured during the study, most of the people in rural communities in Nigeria like the study population, are likely to fall within the low socioeconomic status level which brought about the very high prevalence rate. On the whole, these differences in prevalence rates are as a result of differences in geographical area, type of population under study sample size, sensitivity of screening method employed, health resources and sociocultural practices among numerous reasons [2, 25].

The preponderance of infection in this population might not be unconnected with the fact that the study was carried out among a rural population. Some researchers have noted that infection with HCV is higher in rural than urban areas [3, 15]. Poverty has also been linked to the spread of common diseases [25]. Results of the present

study also suggest an increase in the prevalence of HCV infection in Nigeria corresponding to an increase in HCV prevalence in the world Hanafiah, et al. [6]. Obienu, et al. [23] posited that the global epidemiology of HCV has been changing while Gacche and Al- Mohani [25] noted that the burden of the disease is expected to increase as the disease progresses in patients who contracted HCV years ago

The prevalence of HCV infection when stratified by gender is controversial. In the present study infection was higher among males (24.5%) than females (23.7%). This is similar to results of a study in Nigeria [13] but in contrast to other Nigerian studies [11, 22] and reports from Yemen [25].

Similarly, marital status was not found to be a significant risk factor in this viral infection although the prevalence of infection was 27.2% and 21.3% in the singles and married respectively. It might not be unconnected with fact that there was a high prevalence within the general population even though with no identifiable risk factor. Sexual transmission as a risk factor was not mooted in this locality because the unmarried could not have been more sexually active than the married participants. Moreover, the most efficient mode of the viral transmission has been reported to be through large or repeated direct percutaneous exposure to blood [23].

With respect to age, anti- HCV detection was generally high in all the age groups except those aged 51 years and above where prevalence was only 3.6% compared to above 20% in all the other age groups. The very high prevalence among children may suggest vertical as well horizontal transmission especially as the virus is not vaccine preventable. Similar to our observation, some researchers have reported highest infection rates among those aged 21 – 40 years [15, 20, 21] and 26 – 35 years [10]. The high prevalence rates found among young adults maybe partly be a reflection of cumulative risk exposure to the virus with age. Infection with HCV has been referred to as disease of young adults [26]. Horizontal transmission might have also contributed in sustaining the high prevalence in older groups. This has been reported in a similar study in Bangladesh [4]. However, mortality due to HCV related sequlae may have led to a decrease in prevalence in old age as reported among those above 50 years of age in this study. Spontaneous clearing of infection cannot be ruled out as has been reported [27, 28]

Educational level was found to be significantly associated with viral infection ($p < 0.05$) which was highest among those with a non-formal education and least among those with a secondary level of education. Education has more often than not been seen to put one at an advantage when it comes to many things, health matters inclusive. This is because basic hygiene in various forms and under various fora is usually taught in most formal schools unlike non-formal schools where their curriculum is usually skewed towards some specifics like religion, learning to read and write, or learning a trade. This might have been the reason for this viral infection prevalence being two times higher among those with a non-formal education than those with a formal education.

The occupation of the participants was not a statistically significant risk factor to infection. Artisans were found with the highest prevalence rate (40%) although it was relatively high in all occupations. This could have been the reflection of the prevalence in the population. However, in a similar study, Oje, et al. [29] reported farming as a risk factor in dual infection with HBV and HCV in Ekiti, Nigeria. On the whole there was no statistically significant relationship between anti-HCV prevalence with age, sex, occupation and marital status. This finding is similar to that of other independent Nigerian studies [1, 13, 23] where no commonly presumed risk factor was significantly associated with the infection. Worthy of note is the information that there is an increase in the number of intravenous drug users in Nigeria especially among students of Secondary and Tertiary institutions in Central Nigeria [30]. This is a risk factor that most Nigerian studies of general populations do not include.

5. CONCLUSION

The present study reported a HCV infection prevalence of 24.2% which is the highest published report for a rural Nigerian population with education as an identifiable risk factor. This means there is a large reservoir of

infected persons in this population with a consequent transition to end-stage liver diseases. And although the risk factors were obscure, educating people about the virus and basic hygiene will help provide prevention and control measures.

Also, the risk factors employed in this study may be appropriate for the risk assessment of another group not this. Large scale Longitudinal studies are required to re-evaluate risk factors for the transmission of HCV in Nigeria taking into account the sociocultural and other salient practices that could predispose people to infection.

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