Original Research Article

SEROPREVALENCE OF HEPATITIS A INFECTION AMONG YOUNG ADULTS IN ILORIN

ABSTRACT

Hepatitis A infection is predominantly caused by Hepatitis A virus which is transmitted by fecal-oral route through contaminated food or drinks. The virus's ability to cause hepatitis poses as a major hazard to public health. This study was done to discover the widespread presence of hepatitis A among young adults in Ilorin, Kwara State. A Cross sectional sampling technique was employed to select the study population. Semi-structured questionnaire was used to acquire demographic information of the cohorts. Four hundred (400) young adults residing in Ilorin were the participants in the study.

Five mls of venous blood sample were obtained from each of the participants through venipuncture technique. The blood samples were separated and the serum used for qualitative analysis of hepatitis A virus IgG using EIA and indirect ELISA technique.

Out of the four hundred (400) healthy young adult subjects, an overall distribution of 1.5% IgG Hepatitis A were found among participant in Ilorin. Fulminant stooling, location, gender, educational level, age and occupation were risk factors for acquiring Hepatitis A infection. There was significant difference between Hepatitis A infection and Fulminant stooling ($p<0.05$). Previous history of blood transfusion was not statistically associated as a potential risk factor for Hepatitis A infection among Inhabitants in Ilorin. High prevalence of anti-hepatitis A virus IgG levels of the antibody was reported among young adult in this study. Based on the findings of

this study, screening of hepatitis A virus for blood transfusion and food vendors, personal hygiene are highly advocated.

Introduction

Hepatitis A is a non-enveloped ribonucleic acid (RNA) virus which is transmitted by fecal-oral route [1]. It has a Global presence with a higher occurrence in developing countries due to standard of living and environmental conditions which enhances its' infection in children [2]. The increased level of sanitation in developed countries has caused a decrease in hepatitis A infection and first time exposure is at older age [3]. Contrarily, in developing countries where poor sanitation is still paramount most children are infected with HAV before the age of nine [4]. Hepatitis A virus (HAV) is a leading cause of acute liver disease. Infection in young children can be asymptomatic while older children and adults can develop jaundice and severe illness which can affect their daily activities and may lead to live failure and death. The major causative factor for hepatitis A includes unhygienic water supply and other poor living conditions. Higher standard of living and availability of clean water leads to a decrease in hepatitis A outbreak. [5]. A decline in its outbreak is shown in age-specific seroprevalence that indicates some children have developed active immunity and lesser new infections are evident in adults [6]. There are about 1.4 million cases 200 million asymptomatic carriers recorded per year globally [7]. Due to good sanitary infrastructures and instituted immunization schedule for citizens traveling to endemic regions, there's a significantly low infection rate [8]. HAV can be transmitted through person-person and contaminated water and foods. HAV has the ability to survive on environmental surfaces, human skin and sewages because of their resistance to low PH, low temperature, moderate heating and chemical agents [9]. A Nigerian study was done in an urban

based hospital, therefore the study was carried out on health children [10]. In North Central, the seroprevalence (2.94%) of HAV among the subjects of a study been carried out in Abuja is considerably lower than the previous reports from Nigeria [11]. Asides from the fecal oral route, HAV can also be contacted sexually from asymptomatic carriers [12]. The pathogenesis of hepatitis A is that when it enters via the intestinal tract, and is transported to the liver following a viremic stage, in which virus can be detected in the blood stream. Hepatocytes are the site of replication, and virus is thought to be shed via the bile. In experimental infections in non-human primates, HAV viral antigen and/or genomic material has been found in the spleen, kidney, tonsils and saliva, suggesting that other sites of replication may exist. In vitro, cells are generally not destroyed by the virus, and the damage to liver epithelial cells in vivo often is limited [13]. Symptoms of acute HAV infection may include several weeks of malaise, anorexia, nausea, vomiting, and elevated aminotransferase levels. Jaundice develops in more severe cases. There is no specific treatment for hepatitis A. Recovery from symptoms following infection may be slow and may take several weeks or months. Most important is the avoidance of unnecessary medication. Acetaminophen/Paracetamol and medication against vomiting should not be given. Hospitalization is unnecessary in the absence of acute liver failure. Therapy is aimed at maintaining comfort and adequate nutritional balance, including replacement of fluids that are lost from vomiting and diarrhea [14]. Laboratory diagnosis is based on serological tests to detect the specific antibody produced against the virus or directly detecting the antigen in body fluids using HAV kits and includes Enzyme Linked Immunosorbent Assay (ELISA), Radio Immunoassay (RIA), indirect immunofluorescence, immunodiffusion tests [15].

The aim of this study is to estimate the prevalence and associated socio-demographic factors of serological markers of Hepatitis A among healthy individuals in Ilorin, Kwara State.

MATERIALS AND METHOD

STUDY AREA

The study was carried out in three Local Government Areas within Ilorin METROPOLIS. In collaboration with the primary health care in the environment so as to sensitize the communities. Samples were collected from Ilorin West Local Government (Adewole cottage), Ilorin South Local Government (Ajikobi primary health care) and (Ogidi healthcare).

Study Design

This was a cross-sectional study and epidemiological survey among young apparently healthy individuals in Ilorin, Kwara State. The prospective voluntary donors were given consent to participate in this study and selected as the respondents. Four hundred subjects participated in the study. The participation of the respondents was voluntary and informed consents were obtained from each participant.

ETHICAL APPROVAL

Ethical approval was obtained from Kwara State Ministry of Health Ilorin (MOH/KS/EU/777/216), Informed consents, guideline and monitoring of underaged participants were taken from the parents/ guardian of same.

SPECIMEN COLLECTION

This was done by asceptically collecting 5mls of Blood, using 5mls sterile syringe to aspirate blood sample by using a tourniquet to tie the upper arm, using methylated spirit to swab the cubital fossa and collecting blood sample from the prominent vein (from ante-cubital vein) of a

prospective blood donor at the donor bay. The blood samples were dispensed into sterile, labelled non-anticoagulated bottles and transported to the laboratory. The blood samples were spun at 3000 rpm for 2 minutes and the serum extracted. the separated serum samples from each participant was used for the immunocheomatographic anti HAV testing using commercially available rapid test kits for Hepatitis virus followed by Enzyme linked immunosorbent assay (ELISA) for the detection of HAV IgG antibodies.

Results

Socio-demographic characteristics

A total number of 400 young adult individuals from three local government within Ilorin town, of the age group of 18-40years were enrolled into this study. The mean age of the participants was 28 years with most of the respondents being married 270(67.5%) with divorced rate at 22(5.5%), widow at 4(1.0%) and single are 104(26%). More than third (48.0%) of the participant were literate and either in business 140(35%), housewives 80(20%), civil servant 34(8.5%), farmers 10(5.0%), students 44(22.0%),or unemployed 38(9.5%). 130(32.5) of the respondents were males and 270(67.5%) were females.

TABLE 1 Showing the socio-demographic characteristics of HAV among young adult.

FACTORS	FREQUENCY	PERCENTAGE
Marital Status		
Married	270	67.5%
Single	104	26%
Divorced	22	5.5%
Widow	4	1.0%
Educational Level		
Primary School	50	12.5%
Secondary School	158	39.5%
Tertiary	192	48%
Occupation		
Business	140	35%
House Wife	80	20%

Civil Servant	34	8.5%
Farmer	20	5.0%
Student	88	22%
Unemployed	38	9.5%
Financial Status		
Low	208	52%
Average	190	47.5%
Good	2	0.5%
Location		
Ilorin South	142	35.5%
Ilorin West	134	33.3%
Ilorin East	124	31.0%
Ethnic Group		
Fulani	12	3%
Yoruba	388	97%

Gender		
Male	130	32.5%
Female	270	67.5%
Religion		
Christianity	6	1.5%
Islam	394	98.5%

Table 2 shows that out of the 400 participants studied, 6 of them had positive (IgG) results for hepatitis A infection by the IMMUNOCHROMATOGRAPHIC assay and confirming with ELISA, giving a prevalence value of 1.5%, while 394 (98.5%) were negative.

Table 2: Result Distribution of hepatitis A among young adult in Ilorin

Serology	Frequency	Percentage (%)
Positive	6	1.5%
Negative	394	98.5%
Total	400	100%

Table 3 showed the age groups of the participants with Hepatitis A antigen. age group 36-40 years (66.7%) had the highest prevalence of Hepatitis A infection, this is followed by the age group 30-35 years (33.3%) which has the lowest prevalence.

There was statistical significance association of age groups (p=0.000) with seroprevalence of Hepatitis A infection among young adult in Ilorin Kwara State at $p<0.05$.

TABLE 3: Age Distribution of Hepatitis A infection among young adult in Ilorin Kwara State.

Variables	Number of hepatitis A		P-value	Remarks
	Frequency N=3	% Positive		
Age group			0.000	S
18-23 YRS	0	0		
24-29 YRS	0	0		

30-35 YRS	2	33.3
36-40 YRS	4	66.7
Total	6	100%

KEY:

S= Significance

Table 4 shows that female had the highest prevalence for Hepatitis A with 66.7%, while male has the lowest prevalence of 33.3%.

There was a statistical significance association of Gender ($p=0.000$) with seroprevalence of hepatitis A among young adult in Ilorin Kwara State at $p<0.05$.

TABLE 4: Gender Distribution of Hepatitis A infection among young adult in Ilorin Kwara State.

Variables	Number of Hepatitis A among Ilorin		P-Value	Remarks
	Frequency	% Positive		
Gender			0.000	S
Male	2	33.3		
Female	4	66.7		
Total	6	100%		

KEY:

S= Significance

TABLE 5 DISTRIBUTION OF HEPATITIS A INFECTION AMONG YOUNG ADULT IN ILORIN, KWARA STATE BASED ON MARITAL STATUS.

As shown in Table 5, divorced young adult had the highest prevalence of Hepatitis A (66.7%), while the married young adult had the lowest prevalence (33.3%). There was statistical significance association of marital status (0.000) with seroprevalence of hepatitis A among young adult in Ilorin at $p<0.05$.

Table.5: Distribution of Hepatitis A infection among young adult based on marital status in Ilorin Kwara State.

Variables	Number of Hepatitis A among Ilorin		P-value	Remarks
	Frequency	% Positive		
	N=6			
Marital Status			0.000	S
Married	2	33.3		
Single	0	0		
Divorced	4	66.7		
Total	6	100%		

KEY:

S= Significance

TABLE 6 DISTRIBUTION OF HEPATITIS A INFECTION AMONG YOUNG ADULT BASED ON PREVIOUS HISTORY OF FULMINANT STOOLING.

Table 6 showed that 33.3% of the positive participants had no previous history of fulminant stooling, while 66.6% of the positive participants had previous history of fulminant stooling.

There was no statistical significance association of previous history of fulminant stooling ($p=0.001$) with seroprevalence of hepatitis A infection among young adult in Ilorin Kwara State at $p<0.05$.

Table 6: Distribution of Hepatitis A infection among young adult based on previous history of fulminant stooling.

Variables	Number of Hepatitis A		P-value	Remarks
	Frequency N=6	% Positive		
Previous History of fulminant stooling			0.001	S
YES	4	66.7		
NO	2	33.3		
Total	6	100%		

_ KEY:

S= Significance

TABLE 7 BLOOD TRANSFUSION HISTORY DISTRIBUTION OF HEPATITIS A INFECTION AMONG YOUNG ADULT IN ILORIN KWARA STATE.

Table 7: shows that participants with blood transfusion history that had the highest prevalence are 66.7%, while 33.3% for those with no blood transfusion history which is the lowest prevalence.

There was no statistical significance association of blood transfusion history ($p=0.392$) with seroprevalence of hepatitis A among young adult in Kwara State University at $p>0.05$.

TABLE 7: Blood Transfusion History Distribution of Hepatitis A Infection Among Young Adult In Ilorin.

Variables	Number of hepatitis A among Ilorin		P-value	Remark
	Frequency	% Positive		
Blood Transfusion			0.392	NS
Yes	6	100		
No	0	0		
Total	6	100%		

KEY:

NS= Non-Significance

TABLE 8: DISTRIBUTION of HEPATITIS A INFECTION AMONG YOUNG ADULT IN ILORIN KWARA STATE BASED ON LOCATION.

Table 8 shows that participant that resides in each of the stated residence in Ilorin has equal prevalence of 33.3%.

There was statistical significance association of residence (p=0.000) with seroprevalence of hepatitis A among young adult in Ilorin Kwara State at $p<0.05$.

TABLE 8: Distribution Of hepatitis A Infection Among Young Adult In Ilorin Kwara State University Based On Residence.

Variables	Number of hepatitis A in Ilorin		P-value	Remarks
	Frequency	% Positive		
Residence type			0.000	S
Ilorin South	2	33.3		
Ilorin West	2	33.3		
Ilorin East	2	33.3		
Total	6	100%		

_ KEY:

S= Significance

TABLE 9 DISTRIBUTION OF HEPATITIS A INFECTION AMONG YOUNG ADULT IN ILORIN KWARA STATE BASED ON EDUCATIONAL LEVEL

Table 9 shows that the rate of hepatitis A in Ilorin based on education level has equal prevalence which is 33.3%. There was no statistical significance association of Faculty ($p=0.000$) with seroprevalence of hepatitis A among young adult in Ilorin Kwara State University at $p<0.05$.

TABLE 9: Distribution of Hepatitis A Infection Among Young Adult In Ilorin Kwara State Based On Education Level

Variables	Number of hepatitis A in Ilorin		P-value	Remarks
	Frequency	% Positive		
Educational Level			0.000	NS
Primary school	2	33.3		
Secondary school	2	33.3		
Tertiary	2	33.3		
Total	6	100%		

_ KEY:

S= Significance

TABLE 10 DISTRIBUTION OF HEPATITIS A INFECTION AMONG YOUNG ADULT IN ILORIN KWARA STATE BASED ON OCCUPATION.

Table 10 shows the prevalence of hepatitis A infection among young adult in Ilorin in which the highest prevalence is in business (66.7%), followed by housewife (33.3%). There was statistical significance association of Level in occupation (p=0.000) with seroprevalence of hepatitis A infection among young adult in Ilorin at p<0.05.

Table 10: Distribution of Hepatitis A Infection Among Young Adult In Ilorin Kwara State Based On Occupation.

Variables	Number of hepatitis A in Ilorin		P-value	Remarks
	Frequency	% Positive		
Level in School			0.000	S
Business	4	66.7		
Housewife	2	33.3		
Civil Servant	0	0		
Farmer	0	0		
Student	0	0		

Unemployed	0	0
Total	6	100%

_ KEY:

S= Significance

Discussion

Hepatitis A is a non-enveloped ribonucleic acid (RNA) virus that is transmitted faeco-orally. It has a worldwide distribution with the highest prevalence in developing countries, where environmental and socio-economic conditions favor nearly universal exposure in early childhood. Improvements in public health sanitation have led to a decline in the incidence of hepatitis A infections in the developed countries and to a shift of the time of first exposure to older age. This is not so in the developing countries where sanitation is still a major public health issue and nearly all children are infected with HAV before the age of nine. In most developed countries, endemic HAV transmission is unlikely. In the developing regions of the world, inadequate sanitation results in continuous transmission of HAV infection in children and young individuals. Effort was made in this to determine the prevalence of HAV among the young adult in Ilorin Metropolis.

This study consists of 200 participant that are based in Ilorin Kwara State, Nigeria. This study reveals that 3 (1.5%) out of 200 participants (subjects) were positive for Hepatitis A which is similar (2.4%) to the result of Okara et al in Abuja, 0.67% was gotten as a prevalence rate from outpatient of some selected hospital in Kaduna metropolis [16] and 55% prevalence rate was gotten also from healthy individuals in Calabar [17].

In a previous study done among children and adult in a Tertiary Hospital in Kaduna State

Nigeria, and far lower than the prevalence rates reported from Nigeria in an earlier study on Hepatitis A among all ages in Osogbo city by Afegbua *et al.*, 2013; Sule *et al.*, 2013, as 7.2% and 1.1% respectively.

The result of this study is however in contrast to the observations from some countries such as given by Murchiri et al who reported a prevalence of 2% from Kenya and their subject is adults [18]. However, a higher prevalence of 98.1% was reported from Tunisia [19]. 89% was reported among children and adolescent in Egypt [20]. 44.1% was also reported among children in South Africa [21] These observed differences in prevalence rates could be due to study populations, geographical areas and laboratory methods of identification.

The prevalence rate of Hepatitis A in female samples were a little higher than in males. There was statistically significant association between gender and hepatitis A infection. 6(1.5%) were positive for Hepatitis A compared to male were 0(0%) were positive, this gender specific prevalence might be due tothe fact that females within the study area have more contact with open water in comparison with the males as a result of agricultural and domestic activities. The prevalence of HAV in this study could be attributed to the ability of Hepatitis A to cause asymptomatic infections that go unoticed which can also be cleared by the immune system (self limiting). [22].

The distribution of Hepatitis A among age group 36-40 years with the highest prevalence rate of 4(66.7%) while 30-35 has a prevalence rate of 33.3%, which is in accordance with the work done in university College Hospital, Ibadan, Nigeria with the highest prevalence on the 21-30years age group [23]. Hepatitis A is often asymptomatic in childhood and its morbidity and fatality increase by age [24]. There were statistical significant associations between age and Hepatitis A infection.

The socio-demographic factor such as age is related and associated with Hepatitis A in this study, but it was noticed that most of the participants age 36-40 years fell within educational levels of primary school which explained that due to their illiteracy they may tend to ingest

contaminated food products without adequate sanitation [25]. It could be inferred that the prevalence of HAV among the older age group could be due to low immunity, which wanes with chronological age.

Location of residence was also considered an important demographic factor that could modulate the disease transmission. Those who reside within the three-local government in Ilorin had higher chances of getting infected due to poor hygiene and lack of environmental sanitation. There was statistically significant association between location and Hepatitis A (p=0.000).

The distribution of Hepatitis A based on educational level might be due to high endemity of Nigeria to HAV infection and the prevailing unsanitary condition of Ilorin the later factor was documented by Ramazani et al. There was statistically significant association between educational level and Hepatitis A (p=0.000).

Previous history of blood transfusion as a possible factor was considered and 66.7% of the seropositive individuals had positive history of blood transfusion while 33.7% of the respondents had not received blood transfusion. Unsafe blood screening can cause HAV infection in which there is need for enlightment and introduction of HAV screening as part of blood transfusion screening. Though there was no statistical significant relationship between blood transfusion and Hepatitis A infection (p=0.392).

History of fulminant stooling was also an important factor in the case that some people living with HAV infection are asymptomatic and can readily disseminate the disease to the public. 66.7% of the seropositive individuals had history of fulminant stooling. There was statistically significant association between fulminant stooling and Hepatitis A (p=0.001).

5.2. CONCLUSION

The 1.5% prevalence rate for HAV infections recorded in this study revealed low endemicity for the Virus within the metropolis. This confirms previous reports of the downward trend in the global seroprevalence of HAV infections. Young adult (30-40 years, $P \leq 0.05$), fulminant stooling ($P<0.05$) and blood transfusion ($P \leq 0.05$) still stand out as potential risks for HAV contraction within the metropolis. There is evidence of improvement in sanitation and Health safety of public eateries within the metropolis.

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