Hepatitis C Antibody and Associated Risk Factors in School Children

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Abstract

Introduction

Hepatitis C virus (HCV) infection is a major global health problem responsible for a significant proportion of chronic liver disease. It accounts for greater than a tenth of cases of chronic hepatitis in Nigerian children. Early detection is paramount as there is currently no vaccine for its prevention and approved treatment protocols are for older children. This study was done to determine the prevalence of HCV antibody and its associated risk factors in apparently well school children aged 5 to under 18 years in Nnewi, a city in South-East Nigeria.

Methods

This was a cross–sectional study of 618 children from public and private nursery, primary and secondary schools across Nnewi. Two questionnaires were used to obtain social behavioral information from the children and their parents respectively. Three rapid diagnostic test strips were used to test blood samples for HCV antibodies. Data obtained was analyzed using SPSS21with the level of significance set at $P \leq 0.05$.

Results

The seroprevalence of HCV was 0.32% (M : F = 1:1). Affected children were aged 10 years and above, of high social class with normal nutritional status. Following Chi square analysis, significant risk factors associated with the observed HCV seroprevalence were maternal transfusion (P=0.012); then older age (P=0.031), scarification (P=0.05) and sexual exposure (P=0.005) for the male.

Conclusion

There is a low prevalence of HCV antibody in apparently well school children. Health enlightenment campaigns to sustain a reduction in and possible elimination of HCV infection in all categories of children are recommended.

Key message: Prevalence of HCV infection is low in apparently well school children.

INTRODUCTION

HCV infection is a major disease burden worldwide, described as an escalating global health problem.[1,2] An estimated 71 million people globally have chronic HCV infection and a significant number of these develop liver cirrhosis or liver cancer.[3] In 2016, 399,000 people were estimated to have died from the complications of HCV infection.[3] The WHO and CDC report that the percentage of infections becoming chronic ranges from 55-85%.[3,4] Out of every 100 people infected by the virus, 60-70% will develop chronic liver disease, 5-20% will develop cirrhosis over a 20-30 year period and 1-5% will die from cirrhosis or liver cancer.[4] Among those with chronic HCVinfection,15-30% run the risk of developing cirrhosis within 20years.[3] It is also estimated that 27% of cirrhosis and 25% of hepatocellular carcinoma (HCC) worldwide occur in HCV

infected people.[1]

Global prevalence of HCV infection is placed at 3%.[5] In Africa, 30-40 million people are reported to have HCV infection with Nigeria reportedly being highly endemic for viral hepatitis[5,6] A study on the trends in HCV infection in Africa found Nigeria and Egypt to have the highest prevalence[7]. Most of these studies were however centered around adults[1,8] and those with obvious risk factors like sickle cell anemia, HIV infection and blood transfusion.[6,9-11] It has also been reported that Africa is the second largest world population where details of HCV infection are lacking.[12] This has a negative impact on proper control and possible elimination of the virus from the region.[12]

Globally, the annual deaths from chronic liver disease (CLD) due to liver cancer and cirrhosis is said to have risen from 1.25 million to 1.75 million from 1999 to 2010.[13,14] HCV infection is responsible for 25% of these cases of CLD.[13,15] A high prevalence of CLD has been reported in Nigeria: 28% in Jos, North-Central[16] and 6.9% in Enugu, South-East Nigeria[17].1n the report from South-East Nigeria, as much as 44.3% and 20.4% of adult patients hospitalized for liver disease had primary liver cancer and cirrhosis respectively and 8.4% of these patients were anti-HCV positive.[17] In South-South Nigeria, as much as 12.3% of patients with CLD were also anti-HCV positive.[18] Long term sequelae of HCV infection usually takes more than a decade to manifest[3], hence most of the reports cited above involved adults.

The mean age for childhood CLD was reported as 10 years ± 4 years in Srinagar, India and 6.4% of these cases were secondary to HCV induced liver disease.[19] In Abuja Nigeria, 57.1% of all the children identified with CLD were due to viral hepatitis and 11.9% of these children were positive for HCV antigen and anti-HCV antibodies.[20]

In the United States of America(USA), HCV has surpassed HIV as a cause of death.[21] Chronic HCV infection is the most common indication for orthotopic liver transplantation in the US.[21] Risk factors for infection with HCV include: receiving blood transfusion or blood product (example clotting factors), organ transplantation, getting a tattoo, use of unsterilized sharps, injection drug abuse, work exposure to HCV as would be seen when handling infected blood, many years of dialysis, having been in jail and most importantly, as it concerns the paediatric age group, being born to a mother infected by HCV.[8] Increased risk to a mother increases the risk to her unborn child. In Nigeria, risk factors associated with transmission of HCV in children include transfusion of unscreened blood or blood product, re-usage of needles and syringes, accidental needle-stick injury, body piercing, traditional scarification/tattooing and sharing of household items such as nail clippers and razor blades.[8,22] Infection with HIV and Hepatitis B Virus (HBV) significantly increase risk of infection with HCV.[3,6,21,23] Additional risk factors in the West African sub-region include traditional circumcision, home birth, tribal scarification and other cultural practices.[24]

Routine immunization with HBV vaccine in industrialized nations has made HCV infection the most common cause of chronic hepatitis in children with vertical transmission being the leading source of this infection.[25] In Nigeria, nothing was found on how HBV immunization has affected long term outcomes of HBV and HCV infections in children. The rate of perinatal transmission of HCV is 5%.[5,26]The mode of delivery-vaginal versus cesarean section, does not affect the transmission rate.[26-28] Breastfeeding has not been found to increase risk of infection.[29-31] There is a dearth of information on the nutritional status of people identified to be positive for HCV.A study done in Karachi, Pakistan reported early and progressive malnutrition in the course of HCV infection.[32]There is currently no vaccine for prevention of hepatitis C and most treatment options are experimental in children being largely adapted from adult regimens.[33] Infection early in life increases the risk of chronicity and subsequent sequelae.

Prevalence of HCV infection among blood donors in Nigeria has been reported as 1.03% by Ngwu et al[34] in Enugu,4.1% by Nwannadi et al[35] in Makurdi, 2.4% by Olokoba et al[36] in Yola and 6% by Buseri et al[37] in Osogbo. Obienu et al[1] found no risk factor to be significantly associated with HCV infection in their study. In some populations, the source/route of transmission is unidentified in up to 20% of cases.[38] Okonko et al[39] in Ibadan found a higher prevalence of HCV infection in younger children and lower values in older ones. This contradicts the more common finding of higher prevalence in older age groups compared to younger ones.[1,40-42]

The goal of this study was to determine the prevalence of HCV infection and its associated risk factors in apparently well school children. This will provide fresh insight into the prevalence of HCV infection in this category of children. Previous studies had focused mainly on adults (who by virtue of older age might have already been exposed to a

number of risk factors) as well as on those who are ill/present to the hospital with preexisting risk factors (such as HIV and blood transfusion among others).[6,9-11] This study augments existing evidence for the prevalence of HCV infection in Nigeria.

METHODS

This was a cross-sectional study carried out in Nnewi, the second largest city in Anambra state in South-East Nigeria.[43] The study population comprised apparently well 5 to less than 18 year old school children from both public and private schools. This age group was chosen in order to capture children enrolled into nursery (5 years and above), primary (6-11years) and secondary (12 to less than 18 years) schools.[44] Inclusion criteria were children within the stated age group and children for whom parental consent had been obtained. Exclusion criterion was children whose parents had consented but who did not give their assent.

Sample size for study subjects was determined using the following formula:[45]

$$n = \frac{Z\alpha^2 PQ}{d^2}$$

A design effect (deff) of 2.69 (Zhang et al[46] applied a design effect of 2.69 while studying Hepatitis B among children aged 5-14years) was assumed. The adjusted sample size required was then calculated as:

n_c = n × deff where,

n_c – adjusted sample size,

n – base sample size

The number of schools selected was calculated by correcting for design effect using the following formula:

Number of clusters (schools) = n/s × deff

Where,

n – base sample size

s – cluster size (fixed at 40 students)[47]

Multi-stage proportionate sampling was used both for school selection and recruitment of study subjects. Stage one involved stratification by private and public schools, stage two involved further stratification according to the level of education-nursery, primary and secondary and the final and third stage of stratification involved proportionately dividing the values obtained between the four autonomous communities in Nnewi - Otolo, Umudim, Uruagu, Nnewi-ichi based on the total number of schools/students in each community. Simple random sampling by balloting was used for final selection of schools and study participants from the selected schools. Data used for these calculations were obtained from the Planning, Research and Statistics (PRS) department of the Nnewi-North Zonal offices of the Anambra state Ministry of Health, Post Primary Schools Service Commission (PPSSC)as well as State Primary Education Board(SPEB).

Two questionnaires, A and B, were used for data collection. Female genital mutilation (FGM) was referred to as 'female circumcision' so that the respondents will understand. The class teachers helped to ensure proper distribution and collection of the informed consent forms and self-administered questionnaires (Questionnaire A). Available phone contact/s of consenting parents/guardians as recorded in the school or obtained from the class teachers was used to reach them in an attempt to maximize response rate. All the parents/caregivers of recruited children filled questionnaire A. Questionnaire B was administered to participants who were 12years and above. Physical examination was done looking out for tattoos, scarification marks, piercings, scars from surgery and road traffic accidents (RTAs).

Three diagnostic test kits using plasma were used in this study. Three kits were used to ensure validity of results obtained. The first kit–Acumen Diagnostic HCV Tests (Acumen Labs and Diagnostic Center, Bangalore, India; NAFDAC permit NO 0071654,Lot: HCV16030005, Exp. date:2018-03) was employed as the primary test kit while the remaining two–Global® HCV-Ab kit (manufactured by Global diagnostics, USA; Lot No: HCV15030003; Exp. date:2017-02) and LabACON HCV-Ab kit (Citrus Diagnostics Inc., British Columbia, Canada; NAFDAC REG NO 03-3072; Lot: HCV15100011; Exp. date:2017-09) were used for further testing to confirm results. The test strips had control lines which if absent invalidated the test result. Exact application of the test kit and interpretation of results obtained as either reactive or non-reactive was as prescribed by the manufacturers. Each of the test kit was also validated using a blood sample previously confirmed to be HCV positive as well as a sample also known to be HCV negative. Socioeconomic status of the children was determined using Oyedeji's Social Classification Index included as an

appendix. Data was collected from September to November, 2016. Each day's samples were tested on the same day. Nutritional status was analyzed using the BMI for age and gender z-scores.

The Outcome/Dependent variable for this study was HCV sero-status which was measured as a categorical dichotomous variable having the outcomes of either positive or negative. The Explanatory/Independent variables were (1) risk factors for HCV infection which included having a mother with known HCV infection, blood transfusion, traditional scarification, sexual exposure, presence of piercings on the body and circumcision; (2) nutritional status and (3) socio-demographic characteristics such as socio-economic status, age and gender.

Data was analyzed using the SPSS21.Categorical variables were analyzed using the chi-square (χ^2) analysis for association. Logistic regression was employed to determine the independent effect of the explanatory variables on the outcome variable and control for possible confounders. A P-value of ≤ 0.05 indicated statistical significance.

Ethical approval was obtained from the Ethical Review Committee of NAUTH, Nnewi and was used to get a study permit from the Anambra state Ministry of Education. The aim of the study was explained to the selected school heads and members of the Parents' Teachers Association (PTA) of the selected schools. Subsequently, a signed or thumb printed consent form was obtained from consenting parents/guardians and assent was also obtained verbally from recruited study subjects before blood sampling.

RESULTS

Six hundred and seventy pupils were sampled. However the data of 618 were analysed; 52 pupils were excluded from the final analysis due to absence of assent (mostly from the nursery section), non-return of or very poor completion of the questionnaire. There were 354 (57.3%) females in this study. The age category with the highest number of study subjects for both males and females was the 5-9 year group. The mean age of the study subjects was 9.99 years ± 3.74. Socio-demographic characteristics of the study subjects are described in Table 1.

Table 1

Socio-demographic characteristics of the study subjects

Characteristics	n	%
Age category (years)		
5-9	290	46.9
10-14	241	39.0
15- <18	87	14.1
Gender		
Male	264	42.7
Female	334	57.3
Socioeconomic category		
High	208	33.7
Middle	288	46.6
Low	122	19.7
Religion		
Christian	606	98.1
Muslim	4	0.6
Others	8	1.3
Tribe		
Igbo	599	96.9
Hausa	6	1.0
Yoruba	2	0.3
Others	11	1.8
Nationality		
Nigeria	616	99.7
Others	2	0.3

Age category	Male	Female	Total
5-9	143 (49.3%)	147 (50.7%)	290 (100.0%)
10-14	98 (40.7%)	143 (59.3%)	241 (100.0%)
15-<18	23 (26.4%)	64 (73.6%)	87 (100.0%)
Total	**264 (42.7%)**	**354 (57.3%)**	**618 (100.0%)**

Points were awarded for each parent's educational level and occupation as in the table above.

Social Class The mean of both parents' education and occupation to the nearest lower whole number

= (Father's Occupation + Father's Education) + (Mother's Occupation + Mother's Education)

to the nearest lower whole number

Interpretation of result

1 and 2 = High class

3 = Middle class

4 and 5 = Lower class

Prevalence of HCV antibody from this study was 0.32%.There was equal gender distribution (1 male and 1 female among the seropositive participants).The results obtained were same for the 3 test strips used. All positive cases were among children 10 years and above – Table 2 and 3. The anti-HCV positive cases were of high socio-economic

status – Table 4.

Table 2

Distribution of the study subjects according to age(in years) and anti-HCV antibody status

Age category (in years)	Hepatitis C antibody status		Total (%)
	Negative (%)	Positive (%)	
5-9	290 (46.93%)	0 (0.00%)	290 (46.93%)
10-14	240 (38.83%)	1 (0.16%)	241 (38.99%)
15-<18	86 (13.92%)	1 (0.16%)	87 (14.08%)
Total	**616 (99.68%)**	**2 (0.32%)**	**618(100.00%)**

Table 3

Age and gender distribution of HCV sero-positive study subjects

Gender category	Age	HCV sero-status		P-value
		Negative	Positive	
Male	5-9	143	0	
	10-14	98	0	
	15-<18	22	1	***0.031**
	Total	**263**	**1**	
Female	5-9	147	0	
	10-14	142	1	0.663
	15-<18	64	0	
	Total	**353**	**1**	

Chi square – test of association. *Significant, P < 0.05

Table 4

Association between socio-economic class and HCV seropositivity in the study subjects

Socio-economic status	HCV sero-status			Total
	Negative	Positive	p-value	
High	206 (33.33%)	2 (0.32%)	0.383	208 (33.65%)
Middle	288 (46.60%)	0		288 (46.60%)
Low	122 (19.74%)	0		122 (19.74%)
Total	**616(99.68%)**	**2 (032%)**		**618 (100.00%)**

Two hundred and seventy participants (43.7%) had been circumcised with 52 of them (14.7%) being female. Two hundred and forty-nine (40.3%) study subjects, females only, had pierced ears. Sixty-one (9.9%) care-givers acknowledged their children had received scarification marks however only 35 (5.7%) of them had evidence of this on physical examination and 22 (3.6%) were tribal marks. The male who screened positive had received scarification marks.

Most of the participants, 608 (98.4%) had received an injection in the past. The greater percentage of these, 534 (86.4%), including those who tested positive for HCV antibody, confirmed that the needles used were always from fresh packets. Out of the 466 participants that had acknowledged receipt of HBV immunization, only 1 was positive for HCV antibody (p-0.973). Sixty-seven (10.8%) had been in an RTA while 24 (3.9%) had been operated on at some time.

Seventeen (2.8%) parents knew their children had been sexually exposed while 26 (4.2%) children (above the age of 12) confirmed being exposed sexually, most of which were heterosexual (M–19, F–6). One female reported sexual relations with both sexes. Among the anti-HCV positive cases, it was the male who had been sexually exposed.

Only 141 (22.8%) of the study subjects' parents acknowledged having ever screened them for HIV. None of the recruited children had a western/modern day tattoo nor had ever been injected with illicit drugs. Details of the association between risk factors analysed for and HCV seropositivity in the study subjects are shown in Tables 5 and 6. The mean BMI for age and gender z-score for the study subjects was -0.98 ± 1.61; those who tested positive for HCV antibody had normal values. The relationship between risk factors for HCV and HCV seropositivity using logistic regression are shown in Table 7.

Table 5

Association between risk factors for HCV infection and HCV seropositivity in the study subjects

Risk factor	Total	HCV serostatus of study subjects		P-value
		Negative	Positive	
Maternal transfusion	75	73	2	***0.012**
Transfusion in the child	46	46	0	0.987
Maternal HCV infection	10	10	0	0.466
Scarification	61	60	1	***0.050**-M
Injections	608	606	2	0.995
Sexual exposure	26	25	1	***0.005**-M
Circumcision	270	269	1	0.599-M
Piercing (ears)	249	248	1	0.743-F
Previous surgery	24	24	0	0.981
RTA	67	67	0	0.995
Previous jaundice	55	54	1	0.121-M

Chi square – test of association. *Significant, p < 0.05
M – male, F – female, RTA – Road traffic accident

Table 6

Distribution of the study subjects by place of scarification and instrument used for scarification

Scarification	HCV serostatus			
	Negative (%)	Positive (%)	Total (%)	P-value
Where done				
Maternity hospital	11 (18.03)	0 (0.00)	11 (18.03)	0.864
Government hospital	11 (18.03)	0 (0.00)	11 (18.03)	
Private hospital	9 (14.75)	0 (0.00)	9 (14.75)	
Homeopathic home	22 (36.07)	1 (1.64)	23 (37.71)	
Others	7 (11.48)	0 (0.00)	7 (11.48)	
Total	**60 (98.36)**	**1 (1.64)**	**61 (100.0)**	
Instrument used				
Needle	17 (27.87)	0 (0.00)	17 (27.87)	0.712
Razor	32 (52.46)	1 (1.64)	33 (54.10)	
Others	11 (18.03)	0 (0.00)	11 (18.03)	
Total	**60 (98.36)**	**1 (1.64)**	**61 (100.0)**	

Chi-square – test of association. P > 0.05, not significant

Table 7

Relationship between risk factors and HCV sero-status in the study subjects using logistic regression

S/N	Risk factor	Odds ratio	P-value
1	Age category (years)		
	15 - 18	1.000	
	10 - 14(1)	2.088	0.978
2	Gender		
	Female	1.000	
	Male(1)	0.000	0.997
3	SEC		
	Low	1.000	
	High(2)	0.000	0.993
4	Maternal transfusion		
	Don't know	1.000	
	Yes(2)	1.319	1.000
5	Maternal hepatitis		
	Others	1.000	
	Hepatitis C(3)	2.765	1.000
6	Blood transfusion in child		
	Don't know	1.000	
	Yes(2)	1.417	0.977
7	Scarification		
	No	1.000	
	Yes(1)	0.049	0.063
8	Circumcision		
	No	1.000	
	Yes(1)	2.063	0.995
9	Sexual exposure		
	No	1.000	
	Yes(2)	0.083	0.062
10	BMI for age and gender z score	1.478	0.584
11	Method of circumcision		
	Plastibel	1.000	
	Traditional(1)	0.293	1.000

P > 0.05, not statistically significant; SEC – Socio-economic category, BMI – Body Mass Index

Appendix

Oyedeji's Socio-Economic Index

Points	Occupation	Level of Education
1	Senior Public Servants, Professionals, Owners of Large Business Concerns, Senior Military Officers, Large Scale Contractors, Managers.	University Graduate or Equivalent
2	Non-academic Professionals e.g. Nurses, Intermediate Grade Public Servants, Senior School Teachers, Owners of medium sized businesses, Secretaries.	Nigerian Certificate in Education (N.C.E) and Ordinary National Diploma (O.N.D) holders plus other Professional Qualifications
3	Non- Manual Skilled Workers including Clerks, Typist, Telephone Operators, Junior School Teachers, Drivers, Small Scale business owners.	School Certificate holders or Grade II Teachers or equivalent.
4	Petty Traders, Labourers, Messengers, Artisans.	Primary Certificate
5	Unemployed. Full time house wives, Students, Subsistent farmers.	No formal Education. Neither needs nor writes.

DISCUSSION

The sero-prevalence of HCV infection obtained from this study was 0.32%. This implies that approximately 3 out of 1000 apparently well school children will test positive to HCV antibodies. This is similar to the prevalence reported by Ikobah et al[42] in Calabar, Okonko et al[39] in Ibadan and Eke et al[22] in Enugu. They got an overall HCV seroprevalence of 0.3%, 0.9% and 1% respectively in

apparently well children. El-Shabrawi et al[48] also reported a low paediatric infection rate of 0.05-0.36% in USA among apparently well children, the majority of whom were from middle and high social classes. Those who were anti-HCV positive in this study were from high socio-economic class. Ability to achieve spontaneous and sustained clearance of HCV infection in some children can also explain this low prevalence.[49,50] Although high prevalence of HCV infection has been reported in Nigeria, most of these studies were in ill patients presenting to the hospital for care or also involved adults.[1,6,8,9-11,23,51-53]

The anti-HCV positive cases in this study were 10 years and above. This is similar to what has been reported in other studies and suggests that increasing age increases exposure to risk factors and possibly infection with HCV.[1,40,41] Unlike what had been reported previously, gender was not a significant determinant of seropositivity in this study.[8,22,23,39,42] However, older age was significantly associated to seropositivity in the male who had been exposed to more risk factors compared to the anti-HCV positive female. This might be because males lead a more adventurous life style. In addition risk for HCV infection, as mentioned earlier, increases with age.

Scarification was significant in the seropositive male. Eke et al[22] and Ikobah et al[42] reported similar findings though in females. These markings were given in a homeopathic home using an unsterilized sharp instrument and can account for the HCV infection. Ear piercing however did not have a significant relationship to HCV seropositivity in this study. Obienu et al[1] and Madhava et al[41] reported similar findings. Most ear piercings done in recent times use sterile/clean and well packaged earrings for the procedure. This is supported by findings in this research where all but one female had ears pierced with earrings.

Maternal transmission has been reported as a leading cause of childhood HCV infection.[28,54] None of the mothers to the anti-HCV positive children in this study reported having HCV infection. Both mothers had however been transfused before those children were born, in an era when screening for HCV was not available or just taking off.[8,39,55] As a result, these mothers might have had the infection though undiagnosed. Even if they were identified during antenatal care, there is currently (nor has there been) no guideline for treatment of HCV infection in pregnant women.[56-59] There is no post-exposure prophylaxis for newborns of infected mothers nor is there a guideline for treatment in infants.[56-59] Approved treatment schedules are for children 3years and above.[54,48,60] There is also no vaccine for prevention of the infection.[33]

Transfusion is a known risk factor for transmission of HCV infection.[4,8,22,31,40] Though none of the children who tested positive for HCV antibodies had ever been transfused, their mothers had been transfused before they were born. Proper screening of blood and all blood products before transfusing will go a long way in keeping this risk factor in check.[1,55]

Sexual exposure has been identified as a risk factor for HCV infection.[8,61] and had a significant association to HCV seropositivity in the positive male in this study. The lowest risk for transmission however is reported among heterosexual couples.[62] In all but one of the participants above 12 years (including the positive male) that had acknowledged sexual exposure in this study, it had been with individuals of the opposite gender. The greater percentage of needles used to administer injections to the study participants were from fresh packets. Intravenous drug abuse, which is the leading risk factor for HCV infection in developed countries, was not practiced by any of the study participants.[21]

Socio-economic class did not have a significant relationship to HCV seropositivity. The greater proportion of the study subjects were from middle and high social classes and the children who tested positive were all of high socio-economic class. This is similar to what was reported by Eke et al[22]. Because the greater proportion of study subjects were from the middle and high social classes, it might explain why the positive cases were got from those groups. In contrast to this, Ikobah et al[42] reported that those who tested positive in their research were of low socio-economic status though the relationship was not significant.

The anti-HCV positive male had been circumcised. Okonko et al[39] and Eze et al[23] reported similar findings. Male circumcision was however not found to have a significant relationship with HCV seropositivity in this study. The greater proportion of males in this study, including the HCV sero-positive male, had been circumcised via the plastibel method which is a sterile procedure and as such significantly reduces the risk for transmission of blood borne infections. As much as 14.7% of the female study subjects were reported to have undergone FGM. The female who tested positive for HCV in this study was not circumcised. Such practices are usually done traditionally with unsterilized equipment which increases the risk for transmission of HCV

as well as other blood born viruses.

The anti-HCV positive cases had normal BMI for age and gender z-score. This maybe because both cases were from high socio-economic class. This finding is at variance with Ismail et al's[32] report. The risk factors found to be significantly associated with HCV seropositivity in this study were maternal transfusion for both positives and older age, scarification and sexual exposure in the male. However, after logistic regression analysis, no risk factor had any significant relationship to HCV seropositivity. This tallies with the report by Obienu et al[1]. The overall prevalence for HCV infection got from the study was low and can explain this. In addition, risk factors responsible for infection with HCV have been reported as unidentified on some occasions.[21,38,63]

There are preventive health campaigns going on currently with regards to blood borne and sexually transmitted infections especially HIV and HBV. The effect of these information are more likely to be seen in younger age group compared to older ones who may already be exposed to risk factors prior to the introduction of the preventive activities. This can explain the low prevalence got from this study compared to results of studies involving adults[1,8,41,48] It can also explain why the positive cases were older children.

CONCLUSION AND RECOMMENDATION

A low prevalence of HCV antibody was found in apparently well school children in this study. Significant risk factors associated with the observed prevalence after Chi square analysis were maternal transfusion; then older age, scarification and sexual exposure for the male. The seropositive children were from high socio-economic class and had normal nutritional status. Logistic regression however yielded no significant relationship between the risk factors assessed for and observed HCV prevalence.

A lot of campaigns are ongoing for control of HIV and HBV. It is recommended that HCV control be incorporated into these in order to sustain the reduction and possible elimination of HCV infection in all populations of children.

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