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Original Article

Seroprevalence of Hepatitis C Virus in High School Students of Bangladesh - A Single Centre Study

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Hepatitic C Virus, Seroprevalence, High School Students

Abstract

Introduction*: Hepatitis C virus is an important pathogen due to its high prevalence and ability to cause serious complications like chronic hepatitis, cirrhosis, end stage liver disease and eventually liver cancer. Aim of this study was to Hepatitis C virus seroprevalence in the high school going children in Bangladesh.*

Materials and Method: *It was a cross sectional study carried out in Ghior D.N. High School, Manikganj over 600 high school students within the period from April 2007 to April 2008. Two hundred students each from class VIII to X were selected. Informed written consent was taken from each students and their demographic and socioeconomic attributes, various potential parenteral exposures to blood and blood products were noted down in pre designed structured questionnaire. Venous blood of 3.0 ml was collected and was tested for anti HCV by commercial kit according to standard operating procedure. All positive cases were confirmed by ELISA method. Statistical data analysis was performed using SPSS 20.0 software. Students T test and chi-square test was done to test the significance of the factors of study in relation with the seroprevalence of anti-HCV antibodies. P< 0.05 was considered as significant.*

Results*: The mean age of the participants was 14.6±2.26 years. Of the 600 students, 289 (48%) were male and 311(52%) were female. It was not statistically significant (P=0.089). Among the 600 students, none tested positive for hepatitis C. Of them, 60 (10.0%) belonged to upper class, 222 (37.0%) to middle class and 318 (53.0%) to lower class. Total 34 students had previous history of jaundice and 288 had previous surgeries. Both the comparison between previous jaundice with no jaundice and previous surgeries with no surgery was not statistically significant (P=0.18, 0.089).*

Conclusion: *Prevalence of Hepatitis C is 0% in high school students in this study. Further extensive nationwide study should be carried out to determine the real scenario.*

Introduction

Hepatitis C virus is an important human pathogen, not only because of its high prevalence and worldwide burden, but also because of the potentially serious complications of persistent HCV infection. It accounts for about 15% of acute viral hepatitis, 60-70% of chronic hepatitis, and up to 50% of cirrhosis, end stage liver disease and liver cancer[1]. At least 75% acute hepatitis C ultimately develop chronic infection. Researchers estimate that at least 20% of patients with chronic hepatitis C develop cirrhosis, a process that takes at least

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10 to 20 years. After 20 to 40 years, a small percentage of patient with chronic disease develop liver cancer[2]. HCV infection is often silent, and clinical symptoms are absent or minimal unless the disease is severe or cirrhosis is diagnosed[3].

There are different risk factors for acquiring HCV infection. The transmission of HCV primarily occurs through exposure to infected blood and blood products. Risk of transmission includes blood transfusion, injectable drug use, occupational exposure, hemodialysis, solid organ transplantation from an infected donor, high risk sexual activity, and birth to an infected mother[4]. According to the Centers for disease Controls and Prevention (CDC), parenteral route (60%) and risky sexual behaviors (20%) are the most common risk factors for acute HCV infection from 1991 to 1995 in the U.S. Rest of the modes of transmissions like occupational, hemodialysis, household and perinatal accounted for approximately 10% of infection[5]. A potential risk factor can be found in 90% patients and rest of 10% patients without risk factors are categorized associated with low socioeconomic level[6]. Mother to infant transmission is possible but uncommon, and occurred in 3-5% of babies born to HCV positive mothers[7].

Limited data is found for seroprevalence of hepatitis C in school children in the world. In fact, there is no data of seroprevalence of hepatitis C in Bangladeshi high school students. Seroprevalence is 0.0% in two studies conducted in Greece and Japan; while nationwide study in Mongolia found seroprevalence to be only 0.6%[8,9,10]. This study was conducted with an aim to find out HCV seroprevalence among high school students in Bangladesh.

Materials and Method

It was a cross sectional study carried out in Ghior D.N. High School, Manikganj over 600 high school students within the period of 1 year (from April 2007 to April 2008). First, one high school was randomly selected from Manikganj district and then 200 students each from class VIII to X were selected based on availability and willingness from the school for study purpose. Informed written consent was taken from each students and their demographic and socioeconomic attributes, various potential parenteral exposures to blood and blood products were noted down in pre designed structured questionnaire. Venous blood of 3.0 ml was collected in a sterile test tube aseptically by venipuncture. Blood was tested for anti HCV by commercial kit according to standard operating procedure of manufacturer's instruction (Anti HCV test done by Excel HCV rapid device, made in USA)[11]. Sensitivity of this method was found to be 99% with specificity of 98.6%[12]. All positive cases were confirmed by ELISA method.

Statistical data analysis was performed using SPSS 20.0 software. Students T test and chi-square test was done to test the significance of the factors of study in relation with the seroprevalence of anti-HCV antibodies. Logistic regression analysis was applied to identify the risk factors. $P< 0.05$ was considered as significant.

Results

A total of 600 high school students were enrolled in the study. It was carried out in Ghior D.N. High School, Manikganj from April 2007 to April 2008 over the period of 1 year.

Table I showing serological prevalence of HCV among high school students. None of the students were tested positive for hepatitis C.

Table I

Serological prevalence of HCV antibody among the students

Risk Group	Anti- HCV Positive	Anti HCV Negative
High School Student	00(00%)	600 (100%)

The age range of the participating students was 11-20 years with mean age of 14.6±2.26.

Table II showing sex distribution of the students. Of them 289 (48%) were male and 311(52%) were female. It was not statistically significant (P=0.089).

Table II

Sex distribution of the students

Sex	No of Anti HCV Positive Students	No of Anti HCV Negative Students	P value
Male	0 (0.0%)	289 (48.0%)	0.089
Female	0 (0.0%)	(311 (52.0%)	

Table III showing socioeconomic condition of the participating students. Of them, 60 (10.0%) belonged to upper class, 222 (37.0%) to middle class and 318 (53.0%) to lower class.

Table III
Socioeconomic condition of the students

Socioeconomic Class	No of Anti HCV Positive Students	No of Anti HCV Negative Students
Upper	0 (0.0%)	60 (10.0%)
Middle	0 (0.0%)	222 (37.0%)
Lower	0 (0.0%)	318 (53.0%)

Table IV showing history of jaundice among the high school students. Only 34 students had previous history of jaundice and 566 had no such history. It was not statistically significant.

Table IV
History of jaundice among the students

History of Jaundice	Anti HCV Positive	Anti HCV Negative	P value
Present	0 (0.0%)	34 (5.67%)	0.18
Absent	0 (0.0%)	566 (94.33%)	

Table V showing history of previous surgery among the high school students. Total 288 students had previous history of surgery and rest 312 did not have history of previous surgery which was not statistically significant.

Table V
History of surgery among the students

History of Surgery	Anti HCV Positive	Anti HCV Negative	P Value
Present	0 (0.0%)	288 (48.0%)	0.089
Absent	0 (0.0%)	312 (52.0%)	

Discussion

Hepatitis C virus infection is a major cause of liver related morbidity and mortality and represents a major public health problem worldwide.

HCV infection is more notorious than hepatitis B virus infection (HCV) because of greater risk of chronicity and other sequelae of liver disease like chronic hepatitis, cirrhosis of liver and hepatocellular carcinoma. Its prevalence is lower than hepatitis B virus. The overall prevalence of HCV infection is 1% to 2% in most countries but the distribution of HCV varies considerably among different populations[5]. HCV is most frequently transmitted by percutaneous exposure to infected blood or blood derived body fluids and very high rates of HCV infection are found among persons exposed to HCV through these routes.

HCV prevalence rate in USA is about 1.8%[6], 5.3% in Africa, 4.6% in Mediterranean region, 3.9% in Western Pacific region, 2.13% in South East Asia and 1.03% in Europe[13]. There are few studies on sero-prevalence of hepatitis C virus infection in Bangladesh. Study done by Laura Gibney et al. in a population of Bangladeshi trucking industry; studies by Shirin T et al. among injectable and non injectable drug abuse, and study of Khan M et al. in professional and non professional blood donors found prevalence to be <1%, 24.8%, 5.8%, 1.2% and 0.0% respectively[14,15,16].

In this study prevalence of hepatitis C was found to be 0% among 600 high school students. Similar result was found in Crete, Greece and Matsumoto city in Japan[8,9]. But in Mongolia result was not similar with prevalence of 0.6%[10].

Conclusion

Prevalence of Hepatitis C is 0% in high school students in this study. But it was a single centre study. Moreover, sample size was very small considering the fact that it was a prevalence study. Further extensive nationwide study should be carried out to determine the actual prevalence.

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