Screening for hepatitis C virus infection among Minia city school students

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ABSTRACT

Background: Hepatitis C virus (HCV) infection is a global health problem. Cirrhosis and end stage liver disease are considered main complications among adults and children. Egypt show higher level of anti HCV antibodies than other countries. **The current study** aimed at screening school children for the presence of HCV antibodies.
Research design: A cross-sectional research design was used to achieve the aim of this study.
Subject and methods: Two randomly selected schools at Minia district (one urban and one rural) were included in the study, 750 school students were included out of 862 with response rate 87%. A structured interviewing questionnaire that included demographic data and risk factors associated with HCV infection such as history of taking any injectable medications drug use, history of blood transfusion, history of hospital operation… etc. Thorough clinical examination andabdominal U/S were done for those who have history suggestive of hepatic illness. All volunteer participants were subjected to rapid HCV antibody test.
Results: The mean age of the study sample was 15.18 ± 1.95 years, regarding to results of advanced quality rapid HCV antibody test, only 0.7% of school students were positive anti HCV. Regarding relation between risk factors and percentage of anti HCV among school students, blood transfusion, sharing shaving instruments and tooth brush are statistically significant (p = 0.029, 0.031, 0.002 respectively).
Conclusion: The study concluded that the percentage of school students (aged 12–18) years old who are probably infected with HCV was 0.7% (5 out of 750) in Minia district.

Introduction

Hepatitis C virus (HCV) is one of the most common viral hepatitis that affects the liver and was first identified in 1989 [1]. It is a lethal human virus that can cause a chronic lifelong infection of the liver resulting in progressive liver disease that culminates in the development of cirrhosis and hepatocellular carcinoma [2]. Globally, an estimated 130–170 million persons (2%–3% of the world's population) are living with HCV infection. More than 350 000 deaths are attributed to HCV infection each year, most of which are caused by liver cirrhosis and hepatocellular carcinoma [3].

National Egyptian health (2015) issues survey was conducted to describe the prevalence of HCV infection. Age group of (15–59 years) age, the prevalence of HCV antibody was found to be 10.0% and that of HCV RNA to be 7.0%. while children 1–14 years old, prevalence of HCV antibody and HCV RNA were 0.4% and 0.2% respectively [4].

HCV is most commonly transmitted through exposure to infected blood. This can occur through; contaminated blood transfusions, blood products and organ transplants, injections given with contaminated syringes and needle-stick injuries in health-care settings. Other modes of transmission such as social, cultural, and behavioral practices using percutaneous procedures (e.g. ear and body piercing, circumcision,) can occur if inadequately sterilized equipment is used [5].

Data about HCV infection in children is limited compared to adults. Many infected children remain unidentified as children are less likely to have symptoms from their HCV infection. New infections in children continue to occur because of maternal-neonatal transmission or infection transmitted from mother to newborn. The prevalence of pediatric infection varies from 0.05 to 0.36% in the USA and Europe and a mount for 1.8–5.8% in some developing countries [6,7].

Rapid HCV detecting tests for circulating antibodies (anti-HCV) have been available. New serologic test using multiple antigens with

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recombinant protein or synthetic peptides avoid nonspecific cross-sensitivity and increase the sensitivity of HCV test. Studies evaluating accuracy of Anti-HCV rapid test approved high sensitivity and specificity [8].

In Egypt, the situation is quite worse. Epidemiologically, Egypt show higher level of anti HCV antibodies than other countries [2]. Egypt has the highest recorded prevalence of HCV in the world with an estimate of 10% of the population are infected while 7% are chronically ill, mortality is estimated by 40 000 Egyptians a year and at least 1 in 10 of the population aged 15 to 59 is infected [9].

Screening asymptomatic patients who may have an increased likelihood of being infected with HCV is an important step toward improving the detection and ultimately treatment of infected individuals [10]. So that screening for HCV is an important aspect for disease prevention among children by early detection of the virus and providing early and proper treatment and maintaining good health for all individuals in the community.

Aim of the study

This study aimed to explore risk factors and find out the extent of HCV infection among school students in Minia city.

Subject and methods

Research design

A cross-sectional design was used to achieve the aim of the present study.

Setting

The current study was conducted in Zohra school located in Zohra village as a rural school and Minia Islamic school in Minia city.

Sample

Two areas: one rural and another urban were selected randomly; Zohra village and Minia city. Two schools out of 62 (total preparatory and secondary in Minia district) were chosen randomly, Zohra school from Zohra village and Minia Islamic school from Minia city. Among 510 of school students in Zohra village, **432** children (response rate 84.7%) and **318** out of 352 student in Minia Islamic school (90.3%) were included in the study with total of **750** students.

Inclusion criteria

- School students 12–18 years old.
- Both males and females.
- Parent Acceptance

Exclusion criteria

- Proved HCV infected school students.
- Students with current or recent hepatic manifestations.
- Those with chronic hepatic illness.

Data collection

Structured interview questionnaire: It was developed by the research investigator after extensive review of related literature with the consultation of the experts in the field of community and public health medicine from Faculties of Medicine and Nursing at Minia University. The questionnaire was in English language, translated to Arabic by the investigator, and composed of 23 questions within three parts as the following:

- *Part I:* Personal and demographic data: such as (age, gender, place of residence, number of family members, and occupation of parents… etc.).
- *Part II:* It includes risk factors associated with hepatitis C virus infection such as (blood transfusion, surgery, needle stick, invasive maneuvers, attending dentistry clinic…etc.). When the student had lake of information, we gave him Arabic note for parents about these information and collected it later.
- Part III; Rapid HCV antibody test. Studied subjects were tested for anti-HCV (HCV -SCAN of ABON Biopharm, Hangzhou, Co Ltd, China) which is a qualitative membrane based immunoassay for serum HCV antibody detection.
- One ml of blood was drown for each volunteer and serum was separated though centrifugation of the sample. Fifty µl of serum were added to the specimen of the device, then 1 full drop of the buffer is added. Results are recorded in less than 20 min. Positive test is considered if 2 lines appear on the test specimen. Both in regions (C) and (T) [11].

Ethical consideration

A written approval was obtained from the Research Ethical Committee the Faculty of Medicine, Minia University. An official permission was obtained from Directorate of Education in Minia Governorate. Oral consent was obtained from the school students' parents. The directors of schools and the school students were informed about the nature, purpose of the study and its benefits. School students were informed that participation in the study was voluntary and they have the rights to withdraw from the study at any time without giving any reason. Confidentiality was also assured through coding the data. Each participant was interviewed individually by the investigator to fulfill the necessary data.

Study procedure

The investigator initially introduced himself to all school students. Open discussion about HCV was initiated to discover to what extent the school students have knowledge about HCV and the purpose of study screening. Interview conducted to all school students to fill personal data and identify the risk factors they were exposed. The investigator asked school students questions in the questionnaire and marked their response in structured interview questionnaire. The time taken to conduct the structured interview questionnaire for each school child ranged from 3 to 4 min and rapid anti HCV test was done and the time taken until result obtained was 5–7 min. Rate was 14–18 school students/day. Data collection was conducted over about four months period extending from February 2016 till May 2016.

Statistical design

The collected data were, coded, categorized, tabulated, and analyzed using the Statistical Package for the Social Science (SPSS 20.0). Descriptive data were expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage. Fisher exact and Pearson correlation tests were used to investigate the presence of a statistical significance differences with P. value < 0.05.

Results

Table 1 shows distribution of school children according to their personal characteristics, mean age was 15.18 ± 1.95 years. Regarding gender, females were more than males (60% versus 40%). Regarding place of residence, more than half of studied students (57.7%) were from rural area while 42.4% were from urban area. As regard to number of family members, 67% of families range from 3 to 6 persons. Regarding occupation, 47.9% of fathers are clerks and 66.7% of