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Hepatitis C virus antibodies are absent among high risk group of health care workers in Damascus Hospital

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ABSTRACT

Background and study aims: Liver disease caused by hepatitis C virus (HCV) is one of the most serious health issues worldwide. The prevalence of HCV among health care workers (HCWs) is higher than normal population. Our aim is to determine the seroprevalence of HCV among this high-risk group in Damascus Hospital, Syria in 2016.

Subjects and methods: During March 2016, anonymous testing for HCV was offered to 150 residents and physicians from different departments (Surgery, otolaryngology, gastroenterology, anaesthesiology and laboratory) in Damascus Hospital using fourth-generation enzyme-linked immunosorbent assay (ELISA). In addition, each participant was interviewed and answered a comprehensive questionnaire which includes questions on potential hazards, risk factors and the level of awareness about the disease and its ways of transmission.

Results: Surprisingly, all samples tested negative for anti-HCV antibodies, though many participants were already exposed to many risk factors especially as HCWs.

Conclusion: HCV is not a main issue regarding its prevalence among HCWs in Damascus Hospital. Nevertheless, it is still necessary to develop a mandatory well-organized program to increase the awareness among HCWs and develop stricter prevention policies especially about bloodborne diseases transmitted occupationally.

Introduction

Liver disease caused by hepatitis C virus (HCV) is one of the most serious health issues worldwide. It causes death for more than 350,000 people annually [1]. World health organization (WHO) studies detect 21.3 million carriers in the Middle East and more than 185 million patients worldwide, 80% of them are chronically infected and 20% of HCV chronic carriers will develop cirrhosis and hepatocellular carcinoma. Eighty percent (80%) of the chronically infected HCV carriers are asymptomatic which means high numbers of silent carriers and a very high transmission rate [2]. HCV is an enveloped RNA virus with a high degree of genomic variability [3]. A Recent study shows that 75% of transmission routes are parenteral [4], while Intravenous drug misuses, needle stick injury and sharing toothbrushes/razors are other important ways of transmission.

The prevalence of HCV among health care workers (HCWs) vary from country to another. Different studies shows numbers of 0.3% in Saudi Arabia [5], 0.4% in Turkey [6], 1.7% in Brazil [1], 2.6% in Lebanon [7], 4% in New Delhi [8] and 8% in Egypt [9]. One study conducted in Syria in 2001, detected HCV antibodies in 3% [10] of HCWs, which are higher than normal population, measured at 0.4% [11].

Because of continuous contact with blood, HCWs are considered as an intermediate risk group [11,12]. The Study aims to determine the prevalence of HCV among a group of HCWs in Damascus hospital in 2016.

Subjects and Methods

The study is a cross-sectional study conducted in Damascus Hospital, Damascus, Syria. The hospital is one of two main public hospitals which are administrated by the Ministry of Health in Damascus City. It is located near the city center surrounded by very crowded residential area.

During March 2016, 150 residents and physicians in Damascus Hospital were offered anonymous testing for HCV antibodies with

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the use of test codes to ensure confidentiality (total number of residents and physicians in the screened departments with ongoing practice at study month was 310 (C.I. for the given sample = 95%, Margin of Error = 5.76%).

After agreeing and signing a consent form by each participant, approximately 5 ml of venous whole blood was obtained. Each participant was interviewed and answered a comprehensive questionnaire. It includes questions on gender, age, place of birth, marital status, working department, current position; having intravenous drug antecedents, weather needle stick injured, surgical intervened or underwent blood transfusion or haemodialysis. It also included lifestyle habits such as sharing toothbrushes or razors, piercing, circumcision status, household of family member with HCV, history of dealing of HCV infected patients, history of occupational injury from HCV infected patient.

Blood drawing team of the Faculty of Medicine of Syrian Private University underwent a special training course provided by the university on first aid and phlebotomy before the initiation of this study.

Blood sampled from each participant was placed in a plain tube and allowed to clot at room temperature (range 20 °C–25 °C), then centrifuged to its components at 3000–3500 rpm for 5 min. The separated sera then were moved to Eppendorf® tubes, stored in ice bags and transported to the Central Laboratory of the Ministry of Health in Damascus. The sera were directly tested for anti-HCV antibodies presence by fourth-generation enzyme-linked immunosorbent assay (ELISA) [DIA.PRO Diagnostic BioProbes s.r.l, Via G. Carducci, 27 – 20099, Sesto San Giovanni]. The assay was performed according to the manufacturer's instructions (positive result: S/C.O. $\geq$ 1; S = the individual absorbance of each specimen, C.O. = Cut-off). Statistical analysis was carried out using Microsoft Office Excel 2016.

The study was reviewed and approved by the ethical committee of Syrian Private University and Damascus Hospital.

Results

A total of 127 residents and 23 physicians in Damascus Hospital were tested through this study. The mean ages for the participants were 30.34 ± 7.6 years (30.64 ± 7.72 years for males and 28.79 ± 6.92 years for females). Men to women ratio was 126:24. Complete results from questionnaires and serology of all participants were available for analysis. The study covered participants from surgery departments (general, pediatric, vascular, genitourinary, plastic, thoracic, neurological, orthopedic and maxillofacial) as well as otolaryngology, gastroenterology, anaesthesiology and laboratory departments. Participants' ages and occupations are summarized in Table 1.

Surprisingly, all samples of our study group were tested negative for anti-HCV antibodies.

As for the study participants' characteristics, Table 2 shows that 36.7% of the participants reported previous intravenous drug use, 34% reported a history of having at least one surgical intervention, 75.3% had an invasive dental procedure (dental extraction, gum surgery, root canal procedures, etc.) and none (0%) had been exposed to blood transfusion or haemodialysis.

Regarding occupational related exposure, the majority of participants (81.3%) reported an incident of needle stick injury, 79.3% had dealt with HCV infected patients and 23.5% of them reported an injury while dealing with those patients (18.7% of total participants). In respect to lifestyle habits 34% of participants were currently married, none had a habit of sharing razors or toothbrushes, 16% had piercing, most males were circumcised (92.9%), also, none of the participant lived with household members infected with HCV and 18.7% had previous HCV test (negative result).

Table 2
Participants' characteristics.

Variable	No.	%	Notes
Currently married	51.0	34.0	
Antecedents			
Intravenous drugs use	55.0	36.7	
Surgical intervention	51.0	34.0	
Dental procedures	113.0	75.3	
Blood transfusion or haemodialysis	0.0	0.0	
Needle stick injury	122.0	81.3	
Dealing with HCV patients	119.0	79.3	
Injury while dealing with HCV patients	28.0	23.5	18.7 out of total
Sharing toothbrushes or Razers	0.0	0.0	
Piercing	24.0	16.0	(all the females)
Circumcision (males/126)	117.0	92.9	
Household member with HCV	0.0	0.0	
Previous HCV antibodies test	28.0	18.7	All negative

Discussion

Despite the high rate of contact with HCV infected patients and considerable rate of accidents while dealing with them, none of our

Table 1
Participants' ages and occupation.

Variable	Residents	%	Specialists	%	Total	%
Gender						
Male	105.0	70.0	21.0	14.0	126.0	84.0
Female	22.0	14.7	2.0	1.3	24.0	16.0
Occupation	Residents	%	Specialists	%	Total	%
Surgery	91.0	60.7	13.0	8.7	104.0	69.3
General	30.0	20.0	1.0	0.7	31.0	20.7
Pediatric	3.0	2.0	1.0	0.7	4.0	2.7
Vascular	3.0	2.0	3.0	2.0	6.0	4.0
Genitourinary	6.0	4.0	1.0	0.7	7.0	4.7
Plastic	7.0	4.7	2.0	1.3	9.0	6.0
Thoracic	0.0	0.0	1.0	0.7	1.0	0.7
Neurological	6.0	4.0	0.0	0.0	6.0	4.0
Orthopedic	19.0	12.7	3.0	2.0	22.0	14.7
Maxillofacial	17.0	11.3	1.0	0.7	18.0	12.0
Otolaryngology	14.0	9.3	1.0	0.7	15.0	10.0
Gastroenterology	8.0	5.3	3.0	2.0	11.0	7.3
Anaesthesiology	3.0	2.0	5.0	3.3	8.0	5.3
Laboratory	11.0	7.3	1.0	0.7	12.0	8.0
Total	127.0	84.7	23.0	15.3	150.0	100.0

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