ORIGINAL ARTICLE

Prevalence and Associated Risk Factors of Hepatitis C Infection among Doctors and Dentists in Lahore

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ABSTRUCT

Background: The Hepatitis C virus infection has been documented in Medical doctors and surgeons after needle stick injuries. Doctors and dentists with chronic Hepatitis C Infectionhave been found responsible for HCV infection transmission to their patients. The dentists (oral and maxillofacial surgeons and periodontists) are at more risk of getting HCV than general population.
Aim: To evaluate the prevalence of Hepatitis-C infection among doctors and dental surgeons of Lahore metropolitan.
Methods: 151 doctors and dental surgeons from various organizations in and around Lahore Metropolitan from January 2011 to December 2012 were selected in this study. After taking informed consent, their blood samples were obtained according to standard protocol and processed for Anti-HCV antibody detection through ELISA by using third generation ELISA Kit.The Anti-HCV positive serum samples were stored for RT-PCR to estimate the viral load and to investigate the genotypes of HCV for study. Data was analyzed using SPSS version 16. A P-value < 0.05 was considered to be significant.
Results: From 151 doctors and dental surgeons who were tested for anti-HCV, 2 (1.32%) were reactive to anti-HCV. The mean age of reactive and non reactive doctors and dental surgeons was 28.50±0.707 and 28.69± 4.01 years respectively. Significant association was seen for income per month (P-value<0.05), Blood transfusion (P-value<0.05), Ward in which they worked (P-value<0.05), Tattoo on the body (P-value<0.05) with respect to Anti-HCV status. Although some of the odds ratio were >1 but as p-values was insignificant so the odds ratio becomes inappropriate.
Conclusion: In our study two doctors and dental surgeons have HCV infection and are at danger of the disease.
Keywords: Prevalence, HCV, Doctors and dental surgeons

INTRODUCTION

Hepatitis C virus causes Hepatitis, hepatocellular carcinoma and cirrhosis. It is a blood borne infection and prevalent in injecting drug users, health care workers and unprotected sex workers. Doctors and Dentists are also at risk of getting HCV infection because they deal with HCV positive patients, syringes, infected surgical instruments and apparatus (Jindal et al., 2006). Most of the dentists have right feelings regarding blood-borne viral patients. But it is necessary for dentists to take necessary action so that the patients who are sensitive about their status could interpret their actions as normal and the dentists should be genuinely confident about Standard Precautions (Smith et al. 2006). A total of 1097physicians, surgeons, nurses, physiotherapists, radiographers, laboratory technicians of four hospitals of Japan and others members of the staff of four prefectural hospitals in Miyazaki and 183 acupuncturists in Fukuoka City, Japan were tested for viral markers by ELISA. The overall prevalence was 5.5% in acupuncturists. The HCV prevalence was high in the persons who were in direct contact with HCV patients but had no statistically significant which resulted in the view that there is very low occupational risk of HCV infection. (Nakashima et al). The same results had been derived by another Pakistani study conducted by AM Akhtar et al. The HBsAg prevalence was 17 and 7% in the dentists and doctors relatively (Abdul Mujeeb et al. 1994).

Franciscus stated that injection drug use and non injection drugs such as pipes, straws, tattooing needles, acupuncture and body piercing also spread HCV. Sharing of toothbrushes, razors or nail files are less likely possible route of transmission. Needle stick injuries from HCV infected patient to healthcare worker may result in infection, so this can only be prevented by proper dental hygiene which in result can prevent bleeding gums. Healthcare workers should watch standard universal precautions while

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dealing with blood products.HCV could not be transmitted by casual contact such as hugging, coughing, sneezing, drinking glasses and sharing eating utensils.(Franciscus 2008). Dental students had more frequent percutaneous injuries than all other health care students, which indicate that the dentists would be an important route of HCV transmission. (Mahboobi et al. 2010).

A total of 200 admitted patients in infectious diseases clinic were tested after having exposure to potentially infectious materials and identified that health care workers were still exposed even safe needles were used (Krawczyk et al. 2010). The HCV positive doctors were responsible for infection transmission to some of their patients. A total of 729 EPP-performing health care workers were tested for HCV antibodies by immune blot assay. Only one (0.14 percent) worker was found positive for anti-HCV and HCV RNA. There should be careful follow-up of needle stick injuries to prevent further transmission. (Zaaijer et al. 2011).

METHODOLOGY

Present study was carried out to observe the prevalence of laboratory based confirmed patients of Hepatitis-C in doctors and dental surgeons among the population of Lahore metropolitan. The second part of the study was designed to find the risk factors of Hepatitis-C patients from doctors and dental surgeons relating to various organizations in and around Lahore Metropolitan.The third part of the study was designed to investigate the distribution of genotypes of Hepatitis-C virus among doctors and dental surgeons through RT-PCR and their effect on viral load, various haematological and biochemical parameters.

For collection of data on pretested questionnaire (to study the risk factors associated with HCV infection) and blood samples a convenient sampling technique was used in doctors and dental surgeons as it was difficult to access all the members of the groups and many of them refused to participate in the study. The pre-tested questionnaire were got filled (to study the risk factors associated with HCV infection) during the period of one year(January 2011 to December 2012). All the samples were processed at Mayo hospital for Anti-HCV antibody detection through ELISA andthird generation ELISA Kit (ETI-AB-HCVK-4, Diasorin S.P.A Italy) containing 96 wells was used for Enzyme Linked Immunosorbent Assay (Rebuzzini, 2008).

To study the effect of different genotypes of Hepatitis-C virus, the positive samples were processed for complete blood count (CBC) on hematological analyzerSYSMEX KX-21while dedicated Olympus LFT kits were used for Liver Function Tests. Moreover, the Anti-HCV positive serum samples were further checked for qualitative and quantitative analysis for RT-PCR. For Real-time PCR, Cepheid smart cycler was applied by using QIAamp Mini column kit and Sacace HCV Genotyping kitto estimate the viral load and to investigate the genotypes of HCV. In this study the data was analyzed statistically by using SPSS (version 16) (Wayne and Daniel 1995) (Roger et al 2003). All the quantitative data was presented in the form of frequency, percentage and mean±S.D. The qualitative data was presented in form of proportion and percentage where appropriate. For quantitative data t-test for independent sample was used for analytical statistics. Chi-square test was used to analyze the qualitative data. A P-value < 0.05 was considered to be significant. Odds Ratio with 95% Confidence interval was used to see the magnitude of dependency on various risk factors.

RESULTS

The results of estimated prevalence of Hepatitis C virus infection in doctors anddental surgeonsfrom the population in and around Lahore are given in table 1. The current study revealed that dental surgeons were least affected among the health professionals. A total of 151 doctors and dental surgeons were selected and tested for Anti-HCV, only 2(1.32%) were reactive for Anti-HCV. Mean age of reactive and non-reactive individuals was 28.50±0.707 and 28.69±4.01 years respectively. Non-significant difference was present in age of reactive and non-reactive individuals. i.e., (p-value>0.05).

Table 1: Distribution of reactive (Positive) & non-reactive (Negative) Doctors in a Public Hospital

	HEC		Total
	Reactive +ve	Non-Reactive-ve	
Number (%)	2 (1.32%)	149 (98.68%)	151
Mean (Age)	28.50	28.69	28.69
Std. Deviation	0.707	4.01	3.89

(Independent sample t-test) p-value=0.945 Statistically insignificant at 5% α Level

Out of these 151 doctors/dental surgeons only 2 doctors were reactive for Anti-HCV and no dental surgeon was reactive for Anti-HCV. Gender, Ethnicity, Marital Status, Qualification, Visited abroad, Length of service in profession, involved in invasive diagnostic, ever been pricked by sharps, had any surgery, Dental procedure, visit to barber/beautician, relative having disease history and awareness about infection control practice with patients was insignificantly associated with Anti-HCV status. (P-

value>0.05) Significant association was seen for income per month, Blood transfusion, Ward in which work, Tattoo on the body with respect to Anti-HCV status. **(P-value<0.05)**Although some of the odds ratio were >1 but as p-values was insignificant so the odds ratio becomes inappropriate (Table 2 &3)**.**

Table 4 summarizes the distribution of HCV genotypes in doctors and dental surgeons among the positive cases. Among 02 patients reactive for Anti-HCV and these patients' viral genotype was not detected.

Table-2: Distribution of Hepatitis C virus reactive & Non-reactive doctors according to demographic characteristics from Lahore

Demographic Characteristics		Anti HCV		P Value	ODDS Ratio	Confidence Interval	
		Reactive	Non-Reactive			Lower	Upper
Gender	Male	2	119	0.875	1.27	0.059	27.27
	Female	0	30				
Geographical Status	Punjab	2	145	0.187	0.1546	0.006	3.71
	Other Provinces	0	4				
Marital Status	Married	0	55	0.469	0.340	0.016	7.221
	Unmarried	2	94				
Educational Status	Graduate	2	113	0.758	1.608	0.075	34.26
	Postgraduate	0	36				
Socioeconomic Status	21000-30000	0	135	0.000	-	-	
	31000-50000	2	14				

Table-3: Summary of association between Hepatitis C and various indicators about Doctors in a public Hospital

Indicator	Response	Anti HCV		P Value	ODDS Ratio	Confidence Interval	
		Reactive	Non-Reactive			Lower	Upper
Visited Abroad	Yes	1	47	0.577	2.17	0.132	35.44
	No	1	102				
Designation	PG Trainee	2	120	0.448	0.2448	0.004	12.59
	Medical Officer	0	29				
In which ward do u work	Medical Wards	0	58	0.026	-	-	-
	Surgical Ward	0	60				
	Medical+ Surgical	2	31				
What is your working hours per day	<12 Hours	1	74	0.99	1.014	0.062	16.5
	>12 Hours	1	75				
What is your length of service in profession	< 10 years	2	144	0.25	0.1903	0.008	4.456
	> 10 years	0	5				
Are you Involved in invasive diagnostic	Yes	0	82	0.187	0.163	0.007	3.466
	No	2	67				
Have you ever been pricked by sharps	Never Pricked	1	46	0.561	2.239	0.1371	36.58
	Pricked	1	103				
Have you got any kind of surgery	Yes	1	22	0.168	5.773	0.348	95.73
	No	1	127				
Did you receive blood transfusion	Yes	0	1	0.018	19.8	0.637	614.9
	No	2	148				
Have you undergone any dental procedure	Yes	1	61	0.795	1.44	0.088	23.51
	No	1	88				
Have you any tattoo on your body	Yes	0	1	0.018	19.8	0.637	614.9
	No	2	148				
Do you have any relative having	Hepatitis	0	29	0.896	0.8169	0.0382,	17.47
	No Disease	2	120				
Have you visited barber/Beauty Saloon	Razor used	2	134	0.722	0.5762	0.026	12.55
	Razor not used	0	15				
Aware about infection control practice with patient	Yes	2	133	0.757	0.618	0.028	
	No	0	16				

Table 4: Distribution of HCV Genotypes in Doctors and dental surgeons among the Positive cases.

Groups	Types of HCV Genotypes						
	Type-1	Type-2	Type-3	MG*	ND**	UT***	Total
Doctors Dental Surgeons	0	0	0	0	2	0	**2**

MG*= Multiple Genotypes, **ND****= Not detected, **UT***=** Un-typeable

DISCUSSION

Prevalence of HCV infection among doctors e.g. orthopedic, general and oral surgeon has been reported 1-2% by Polish et al. 1993. Anti HCV antibodies were present in 1.7% of the doctors, radiographers and physiotherapist, 1-3% of nurses and 2.2% of the acupuncturists (Nakashima et al. 1993). In our study prevalence among doctors was 1.32% which is in accordance with the study conducted by Polish et at; 1993 and Nakashima et al; 1993. Another study conducted in Pakistan reported 0% prevalence of HCV in doctors but nurses and other HCW were found HCV positive (Sarwar et al. 2008).In other studies across the world reported 0.9 to 1.8% prevalence of HCV in medical doctors. (Thomas et al 1996; Panlilioet al 1995; Gerberding, 1996; Polish et al.,1993; Klein et al.,1991). Moreover, in our study no dental surgeon was found reactive for Anti HCV which is contradictory to the results obtained from the many of above cited studies.Our study is in accordance with Mihaly et al 1996 (4.0 percent) and Jindal et al 2006 (4 percent). HCV prevalence was reported as 1.4 percent in USA and 0.17 percent in Turkey (Gerberding, 1994; Pasha et al 1999).

According to WHO (1999), estimated numbers of FICM's vary from 35 million rising to as many as 100 million if all healthcare-related staff is included, in addition to the doctors, nurses, and midwives in active practice. Jaggeret al (2002) reported that the average rate of HCV infection in exposed HCW's is 0.5 percent. Hepatitis C is considered the most prevalent blood-borne disease in healthcare workplaces (Lanphear, 1997), and each year approximately 800,000 needle-stick injuries occur, according to a report by CDC, 1997 (Lipscomb and Rosenstock, 1997). The prevalence of HCV varies from region to region ranging from 1-4 percent (CDC, 2004). In Pakistan there is a paucity of data about HCV infection in health care workers. By taking this in view we decided to find the prevalence of HCV in dental surgeonsworkers form healthy population of Lahore residing in different areas. We found that HCV prevalence in this group was 26.13%.

A study conducted in Pakistan reported very interesting facts about HCV prevalence in health professionals i.e. 12% had HCV infection, 18% doctors had HBV and 6% doctors had HCV infection. Moreover they also reported that HBV and HCV alone were seen in 5.6% of participants. HBV and HCV together were seen in 3.2% of positive cases (Sarwar et al. 2008). Their findings are almost similar to the findings of the present study and some other reports in literature (Khokhar, Gill and Malik, 2004). Ones Alam et al 2002 discussed that prevalence of Hepatitis C among the HCWs was about 40% that corresponds to our results.

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