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PREVALENCE OF HEPATITIS C INFECTION;

GENERAL PATIENTS ATTENDING VARIOUS HOSPITALS OF LAHORE, PAKISTAN: A CROSS SECTIONAL STUDY

Abdul Majeed Akhtar[1], Sadia Majeed[2], Muhammad Jamil[3], Abdul Rehman[4],

1. Provincial TB Control Program, Punjab, DGHS Office, 24 Cooper road Lahore, Pakistan
2. Food and Nutrition Department, Government College of Home Economics, Gulberg, Lahore, Pakistan
3. Out Patient Department Lab, Diagnostic and Research Laboratory, Mayo Hospital, Lahore Pakistan
4. Department of Epidemiology and Public Health, University of Veterinary and Animal Sciences, Lahore, Pakistan

Correspondence Author:
Dr. Abdul Majeed Akhtar
Program Manager,
Provincial TB Control Program,
Punjab, DGHS Office, 24 Cooper road Lahore.
abdulmajeedakhtar@gmail.com

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ABSTRACT… Objectives: The aim of the current study was to estimate the seroprevalence and risk factors investigation associated with hepatitis C virus (HCV) infection in general patients attending various public and private hospitals of Lahore metropolitan. **Study Design:** Cross sectional study. **Setting:** Out Patient Departments (OPDs) of public hospitals, comprising of Mayo Hospital, Sir Ganga Ram Hospital, Services Hospital, Jinnah Hospital and Lahore General Hospital of Lahore. **Period:** 2012. **Material and Methods:** A total of 904 patients from out-patient departments of five public and two private hospitals were enrolled during 2012. Blood samples were collected to evaluate their anti-HCV status using 3rd generation ELISA. To find out the risk factors associated with HCV infection, the data was collected on a pretested and validated questionnaire. **Results:** The seroprevalence was estimated to be 14.6%. Mean age of reactive and non-reactive general patients was significantly associated (P=0.012) with anti-HCV status. Marital status (OR=2.042), socioeconomic status, blood donation (OR=2.15), prescription by doctor or non-doctor (OR=2.664), route of drug administration, relatives having hepatitis and towel sharing (OR=1.987) were significantly associated (P<0.05) risk factors for HCV infection. **Conclusion:** The study reveals a higher prevalence of HCV infection in general patients of Lahore due to poor socioeconomic status, treatment by quacks, excessive use of injectable drugs, house hold contacts with hepatitis patients and lack of awareness about the HCV transmission.

Keywords: HCV, Seroprevalence, Risk factors, ELISA, General patients.

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INTRODUCTION

Hepatitis C is a blood borne infectious diseases that primarily affects the liver and caused by the hepatitis C virus (HCV) which was identified in 1989 and classified under the domain of family, Flaviviridae.[1] Most of the time the disease remains subclinical for a long period but ultimately it leads to liver cirrhosis and hepatocellular carcinoma (HCC). The single stranded RNA genome of hepatitis C virus (HCV) consists of 9600 nucleotide bases.[2] The major route of transmission of HCV infection includes the infected blood and blood products. Risk factors like blood transfusion, excessive use of injectable drugs, reuse of syringes, use of infected razor and HCV positive sexual partner play an important role in occurrence of HCV infection.[3] Hepatitis C has become a major public health issue worldwide.[4] Its prevalence varies from 4-25.7% in different geographical areas and the highest prevalence had been reported in Egypt.[5]

There is an alarming situation in the developing and under-developed countries due to gradual increase in HCV prevalence. In developing countries like Pakistan the epidemiology and associated risk factors of hepatitis C are poorly understood, especially where self-medication and treatment by quacks is very common.[6] The present study was planned to find the hospital based HCV prevalence in patients attending various public/private hospitals of Lahore and also to study the associated socio-demographic characteristics and risk factors that contribute in understanding the natural history of HCV infection in Pakistan.

MATERIALS AND METHODS

The present cross sectional study was conducted to estimate the hospital based prevalence and investigate the risk factors associated with HCV infection in various public/private hospitals of Lahore metropolitan during 2012. A total of 904 general patients presented in Out Patient Departments (OPDs) of public hospitals, comprising of Mayo Hospital, Sir Ganga Ram Hospital, Services Hospital, Jinnah Hospital and Lahore General Hospital of Lahore Metropolitan were selected through simple random sampling technique. In addition, patients from OPDs of two private hospitals i.e. Farooq Hospital and Ghurky Trust Hospital were also included in the study. To find out the risk factors associated with HCV infection, a pre-tested questionnaire were got filled form all the enrolled patients. The study was approved by the advanced studies and research board of the University of Veterinary and Animal Sciences, Lahore and also from the hospitals. Furthermore, an informed consent was taken from all the participants of the study.

Sampling Frame

All the patients who were presented to the above mentioned seven hospitals for their medical examination during 2012 (N=157242).

Immunological Assays

All the serum samples were subjected to ELISA for HCV antibody detection by third generation ELISA Kit (ETI-AB-HCVK-4, Diasorin S.P.A. Italy) containing 96 wells was used for Enzyme Linked Immunosorbent Assay.[7] The concentration of anti-HCV present in the specimen was measured by spectrophotometer (Labsytem Multiskan Bio chromatic).

Statistical analysis

The data was analyzed statistically by using SPSS (version 16.0). All the quantitative data was presented in the form of frequency, percentage and mean ± S.D. 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 and Odds Ratio (OR) with 95% Confidence Interval (CI) was used to see the magnitude of dependency on various risk factors.

RESULTS

The seroprevalence of HCV in general patients of Lahore metropolitan was estimated to be 14.6% as given in Table-I.

In group of general patients, highest prevalence was estimated in Mayo Hospital (22.3%) followed by Lahore General Hospital (17.8%), Jinnah Hospital (15.5%), Sir Ganga Ram Hospital (15.5%), Services Hospital (14.7%), Ghurki Hospital (10.1%) and Farooq Hospital (6.2%). Out of total 904 general patients 132 were positive and 772 were negative for HCV. Among HCV positive, 59 were male and 73 were female. The mean age for male and female, who were reactive for anti-HCV, was 40.22±14.09 and 38.58±14.13 years, respectively whereas the mean age for male and female who were non-reactive for anti-HCV was 34.34±14.68 and 37.29±13.27 years, respectively. A significant difference (P-value=0.012) was found among the age of reactive and non-reactive patients as shown in Table-II.

Groups of Patients	Public Hospitals										Private Hospitals				Total	
	Mayo Hospital		Sir Ganga Ram hospital		Services hospital		Lahore General hospital		Jinnah hospital		Farooq hospital		Ghurky hospital			
	T	P (%)	T	P (%)	T	P (%)	T	P (%)	T	P (%)	T	P (%)	T	P (%)	T	P (%)
General Patients age > 12 years	130	29(22.3)	129	20 (15.5)	129	19(14.7)	129	23(17.8)	129	20(15.5)	129	8(6.2)	129	13 (10.1)	904	132 (14.6)

Table-I: Prevalence of HCV in general patients presented at outpatient department of various Public and Private Hospitals of Lahore during Year 2012
T= Individuals tested, P=Positive

	Anti-HCV status				Total
	Reactive (n=132)		Non-Reactive (n=772)		
	Male	Female	Male	Female	
Number (%)	59 (44.69%)	73 (55.31%)	339 (43.91%)	433 (56.08%)	904
Mean (Age)	40.22	38.58	34.34	37.29	36.48
Std. Deviation	14.09	14.13	14.68	13.27	14.03

Table-II. Distribution of HCV reactive and non-reactive patients attending Public/Private hospitals of Lahore metropolitan according to their mean age and gender

Independent sample t-test showed a significant association (P-value= 0.012) between age and HCV infection at 5% α Level

Results regarding the association between demographic factors and HCV infection are given in Table-III. The study revealed that socioeconomic and marital status were significantly associated (P-value<0.05) with the occurrence of hepatitis C and Odds Ratio showed that marriage was a risk factor for hepatitis C virus infection. It was also observed that there was no significant difference between male and female regarding occurrence of the disease. Similarly a non-significant association (P-value>0.05) was observed for geographical, educational and occupational status.

A total 904 patients were asked about the determinants to find out their association with HCV infection. Undergone any surgery, place of surgical treatment, blood transfusion, dental procedure, tattoo on the body, ever been pricked by sharps and visit to a barber/beautician were insignificantly associated (P-value>0.05) with Anti-HCV status. A significant (P-value<0.05) association was seen for blood donation (OR=2.15, 95% CI=1.287-3.592), history of use of drugs prescribed by doctors or non-doctors (OR=2.664, 95% CI=1.439-4.93), route of drug used, relative having HCV and towel sharing (OR=1.987, 95% CI=1.262-3.131) with respect to anti-HCV status as presented in Table-IV.

Demographic Characteristics		Anti-HCV status		P-value	OR	95% CI	
		Reactive	Non-Reactive				
	Male	59	339	0.867	1.032	0.712	1.497
	Female	73	433				
Geographical Status	Punjab	128	743	0.681	1.249	0.4318	3.612
	Other Provinces	04	29				
Marital Status	Married	115	593	0.007	2.042	1.195	3.49
	Unmarried	17	179				
Educational Status	Illiterate	125	743	0.113	0.4993	0.2079	1.199
	Educated	07	29				
Occupational Status	Private Job	44	225	0.516	-	-	-
	Public Job	05	23				
	Not Applicable	83	524				
Socioeconomic Status	Low (5000-10000)	95	610	0.000	-	-	-
	Middle (10000-30000)	35	162				
	High (>30000)	02	00				

Table-III: Distribution of HCV reactive & non-reactive patients attending Public/Private hospitals of Lahore metropolitan according to their demographic characteristics

Chi-Square Test showed a significant association of marital and socioeconomic status with HCV infection

OR= Odds Ratio CI= Confidence Interval

Indicators	Response	Anti-HCV status		P-value	OR	95% CI	
		Reactive	Non-Reactive				
Have you undergone any surgery	Yes	34	196	0.928	1.020	0.668	1.556
	No	98	576				
From where you got surgical treatment	Private Sector	08	21	0.092	-	-	-
	Public Sector	26	178				
	Not applicable	98	573				
Did you receive blood transfusion	Yes	34	185	0.675	1.101	0.721	1.682
	No	98	587				
Have you donated blood	Yes	23	69	0.002	2.15	1.287	3.592
	No	109	703				
Have you undergone any dental procedure	Yes	21	160	0.201	0.724	0.440	1.190
	No	111	612				
Have you any tattoo on the body	Yes	06	24	0.394	1.484	0.595	3.703
	No	126	748				
Do you receive injection therapy procedure	Yes	09	43	0.56	1.24	0.589	2.609
	No	123	729				
Have you been pricked by sharp	Never Pricked	15	89	0.956	0.9839	0.5503	1.759
	Pricked	117	683				
Do you use drugs prescribed by	Non-doctors	16	38	0.001	2.664	1.439	4.93
	Doctor	116	734				
If yes what types of Drugs	Oral	92	459	0.003	-	-	-
	Injectable	14	51				
	Oral+ Injectable	26	262				
Are you an injecting drug user	Yes	09	51	0.928	1.034	0.496	2.155
	No	123	721				
Do you have any relative having	Hepatitis	65	222	0.000	-	-	-
	Other infections	00	42				
	No Disease	67	508				
If yes what kind of relationship	Sexual	03	16	0.459	0.623	0.1758	2.208
	Non- Sexual	62	206				
Have you visited barber/Beauty Saloon	Razor used	36	240	0.379	0.8313	0.5504	1.255
	Razor not used	96	532				
Towel sharing	Yes	86	588	0.002	1.987	1.262	3.131
	No	46	184				

Table-IV: Summary of association between HCV infection and various risk factors in patients attending Public/ Private hospitals of Lahore metropolitan

Chi-Square Test showed a significant association of blood donation, drugs prescribed by non-doctor, use of injectable drugs, relative having hepatitis and history of towel sharing with HCV infection

OR= Odds Ratio CI= Confidence Interval

DISCUSSION

Hepatitis C viral infection is a developing epidemic of the new century which now has been connected to many diseases. The evidences from many studies have showed significant relationship between HCV and other general diseases, so the current study was designed to estimate the seroprevalence risk factors associated with the occurrence of hepatitis C virus infection in general patients. In current study, the prevalence

of HCV in general patients was 14.6% which is completely in line with the results of a hospital based study conducted in Japan, that reported 14% prevalence in general patients.[8] Some other studies have estimated a range of prevalence (10-42%) of HCV.[9,10] A study on surgical patients reported 8% prevalence of HCV.[11] Another study reported a low prevalence (1.3%) in general patients which is contradictory to the results of the present study.[12] This difference in prevalence percentage might be due to increased trend of treatment from quacks, un-sterilized surgical procedures and re-use of injections/syringes in our country due to lack of awareness, health education and also financial constraints.

It was found that age was significantly associated (P<0.012) with HCV prevalence as the mean age of reactive individuals was more as compared to non-reactive patients. These results are similar to the findings of a previous study conducted in Pakistan.[13] In our study we found that HCV prevalence was higher among male patients, economically poor class and illiterate people. These findings are in accordance with a previous study, illustrated that HCV infection in males, uneducated people and poor class was higher.[14] A study on surgical patients reported blood transfusion as a risk factor, as 17% of the HCV patients gave a history of blood transfusion. These results are similar to the results of the present study as the OR was 1.1 which suggested that it is very weakly associated risk factor for HCV infection. For tattoos the OR was 1.484 which suggested a weak association with HCV infection. These results are similar to the results of previous study conducted in Nigeria in respect of tattoos being the risk factor for HCV infection but the association found by the latter was strong (OR=4.1) as compared to the present study.[15] The reason could be the more tattooing practices in Nigeria as compared to our country which may lead to increase transmission of HCV infection. In our study drugs prescribed by doctor or non-doctor (quack) was significantly associated (P=0.001) with HCV infection among general patients. Furthermore, it was also found that use of drugs prescribed by the quacks was a risk factor (OR=2.664) for HCV infection. These results correspond to previously conducted studies.[11,12] The reason of drugs prescription being a risk factor might be the excessive use of injectable drugs by quacks and also the reuse of syringes to increase their profit margin.

In the present study blood donation had significant association (OR=2.15, P=0.002) with HCV transmission with unknown reason. This needs to be investigated that either there were commercial blood donors in general patients or not. The screening, although done in blood banks, may have a loop hole for HCV transmission, as a study reported that developed countries by adopting additional measures have reduced the HCV transmission through blood transfusion.[16] Japan introduced a mandatory screening for HCV in 1990 that resulted in abrupt decline in the prevalence form 4.9% to 1.9%. Relationship with hepatitis patients was found significantly associated (P=0.000) with HCV infection. A previous study also reported the similar results.[17] A significant association (P=0.002) was present for towel sharing among general patients with respect to anti-HCV status. The current study investigated that towel sharing was a risk factor (OR=1.987) for HCV infection which is in agreement with the previous studies who also reported the similar results.[18,19] The towel may carry traces of infected blood and its sharing may lead to put the person at a risk of acquiring HCV infection.

CONCLUSIONS

The study reveals a higher prevalence of HCV infection in general patients of Lahore due to poor socioeconomic status, treatment by quacks, excessive use of injectable drugs, house hold contacts with hepatitis patients and lack of awareness about the HCV transmission.

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“Persistence can change failure into extraordinary achievement.”

Maru Levy

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Abdul Majeed Akhtar	Principal Investigator	
2	Sadia Majeed	Co-author, Data analysis	
3	Muhammad Jamil	Co-author, Data collection	
4	Abdul Rehman	Co-author, Data collection & analysis	