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ORIGINAL ARTICLE

Frequency of Occult Hepatitis C Virus Infection in the Spouses of Hepatitis C Virus Positive Patients

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ABSTRACT

Hepatitis C is the major source of cirrhosis, HCC and chronic liver disease and is one of the major reasons for liver transplant and remain undiagnosed in large number of high-risk populations.

Objectives: To assess the frequency of occult hepatitis C virus infection in the spouses of hepatitis C virus positive patients.

Place and Duration: This Cross-sectional study was held in the Hepatitis clinic of gastroenterology ward of Lady Reading Hospital, Peshawar from 21st September 2020 till 20th March 2021 after approval from hospital ethical committee.

Methods: Total 164 patients aged 20 to 60 years of both genders who were hepatitis C virus positive and whose spouses were healthy and asymptomatic were selected for this study. Frequency of occult hepatitis C infection in healthy spouse was determined. Data was analyzed and entered using SPSS 23.

Results: In this analysis, total 164 patients were selected with mean age of 38.6±11.7 years. Among spouse history of previous surgery was present in 41.5%, history of blood transfusion in 47.6%, history of dental treatment in 73.2% and history of drug use in 54.9% sampled population. Frequency of occult hepatitis C infection was present in 7.3% healthy spouses.

Conclusion: Hepatitis C infection is common in spouses of hepatitis C infection. All individuals presenting in OPD should be advised for spouse screening.

Keywords: Occult, HCV, Intra-spousal transmission, intravenous drug use

INTRODUCTION

Hepatitis C infection is the major global community health issue. The overall global prevalence of hepatitis C is estimated at 2.5% and the global rate of change is 67%[1-2]. The most common genotype is Type-I (47.1%) globally, trailed by Type-3 genotype (31.2%). In Pakistan, the hepatitis C virus (HCV) is ubiquitous, and its burden is projected to rise in the years to come, primarily as a result of the pervasive use of risky medical treatments[3-4]. According to data from 2010 to 2015, this virus affects 6.8% of the general population and 25% of people living in underdeveloped rural and suburban areas. Hepatitis C is spread through blood exposure (such as transfusions or organ transplants from infectious donors, medication injection, and unintentional needle sticks) as well as mucosal exposure to blood or serum-derived fluids (such as childbirth from an infected mother, or intercourse)[5-6]. Hepatitis C is the most common cause of cirrhosis, hepatocellular carcinoma, chronic liver disease, and is also one of the main reasons for liver transplantation[7-8]. Age upon infection of over 40 years, alcohol intake of 50 g or more daily, and male gender are factors linked to a higher likelihood of fibrosis advancement in hepatitis C patients. A 2015 study that was written up in the Journal of Medical Virology found that 4% of individuals with HCV infection's healthy spouses had latent hepatitis C[9-10]. However, there is scarcity of data regarding the transmission to spouses in our local population. Moreover, there are factors like delayed diagnosis of hepatitis C and stigma attached with the diagnosis of communicable diseases which cause people with such diseases to hide this information from others including family members[11]. Because of scarcity of data in our local population, my study aims to determine the frequency of occult hepatitis C virus infection in healthy spouses of hepatitis C virus positive patients in our local population. This information will be useful for preventive and public health related purposes.

METHODS

This Cross-sectional study was held in the Hepatitis clinic of gastroenterology ward of Lady Reading Hospital, Peshawar from 21st September 2020 till 20th March 2021 after approval from hospital ethical committee.

Sample size was 164 and Non-probability consecutive sampling technique was used. It was calculated with World Health Organization's "sample sizing in health research" software. The "absolute certainty percentage of the population" formula was used based on the various norms: • Confidence interval: 95% • 3% of Absolute precision • Predicted rate of hepatitis C infection in spouses of hepatitis C infected patients: 4%

Inclusion Criteria: 20 to 60 years old patients of both genders who were hepatitis C virus positive (as mentioned in the operational definitions above) and whose spouses were healthy and asymptomatic was included in the study regardless of the duration since diagnosis of hepatitis C. This means that patients who had just recently been diagnosed as having hepatitis C was included in the study.

Exclusion Criteria: Patients whose spouses lived abroad were not be included in the study, patients who refuse to had their spouses tested were also be excluded from the study, any patient with hepatitis C whose spouse was already known to be positive for hepatitis C before the diagnosis in the patient was also omitted.

The study was held after hospital's ethical and research committee approval. Eligible patients in the gastroenterology department of the hepatitis clinic at Lady Reading Hospital in Peshawar were selected in the study after obtaining written informed consent. The purpose of the study and the benefits of this study were explained to all enrolled patients at the start of the study prior to enrollment. Patients with any amount of HCV-RNA detected in peripheral blood mononuclear cells (PBMCS) by real-time polymerase chain reaction (PCR) were included in the study if they had a healthy, asymptomatic partner. The viral levels of the patients were also noted in the PCR reports. In addition, the patient's liver function tests were also tested, and if the ALT or AST values were above the upper limit of normal, this was marked as 'liver dysfunction'. The patient's medical history was examined for the time that had elapsed since the diagnosis of hepatitis C, these patients were asked to report to the outpatient clinic for a

follow-up visit, and during this visit, blood was taken from the spouses and sent to the laboratory. To be checked for hepatitis C Hidden hepatitis C infection in the spouses was diagnosed according to the result specified in the operational definition. In addition, the spouse was asked about a history of previous surgeries, blood transfusions, dental treatment, intravenous drug use, or blood transfusions. The length of the couple's marriage was also questioned and recorded. All these data were recorded in a pre-designed proforma for future analysis. Data were analyzed with SPSS 23. The percentages and frequencies were used to define categorical variables such as gender, presence/absence of liver dysfunction (patients), presence/absence of latent hepatitis C infection (spouses), and spouse's surgical history, the spouse's blood transfusion history, the spouse's dental history, the spouse's intravenous drug use history, and the spouse's blood transfusion history. The S.D and mean for numerical variables were calculated such as duration of marriage, age, PCR virus level (in patients) and time elapsed since diagnosis of hepatitis C virus (in patients). It was classified according to the pervasiveness of latent hepatitis C in the spouses, different age groups, gender, patients' liver dysfunction, patients' viral load, duration of marriage, and time elapsed since the patient's hepatitis C positivity history. the spouse's prior surgery history, the spouse's blood transfusion history, the spouse's dental history, the spouse's history of injecting drug use, and the spouse's blood transfusion history. After stratification, a chi-square test was used, where p ≤0.05 was considered significant.

RESULTS

In our study total 164 patients were enrolled with mean age of 38.6±11.7 years. Table 1 Mean duration of marriage was 8.1±5.2 years. There were 61% males and 39% females' patients.

Table-1: shows the demographic features of the patients

	N	Minimum	Maximum	Mean	Std. Deviation
Age (years)	164	20	60	38.65	11.715
Genders					
	No	Percentage			
Males	100	61.0			
Females	64	39.0			
Total	164	100.0			

Table 2: Mean viral load in patients was 348.2±101.74IU/ml and mean duration of hepatitis C infection was 3.9±2.1 years.

Duration of marriage (years)	N	Minimum	Maximum	Mean	Std. Deviation
	164	1	39	8.15	5.23
Viral load	N	Minimum	Maximum	Mean	Std. Deviation
IU/ml	164	210	2160	348.21	101.74
	N	Minimum	Maximum	Mean	Std. Deviation
Duration of hepatitis C infection in patient (years)	164	1	9	3.95	2.17

Table-3: In 42.7% patients LFT were deranged.

		Frequency	Percent
Valid	Yes	70	42.7
	No	94	57.3
	Total	164	100.0

Table-4: Among spouse history of previous surgery was present in 41.5%, history of blood transfusion in 47.6%, history of dental treatment in 73.2% and history of drug use in 54.9% sampled population.

Table 4: Risk factors for hepatitis C infection

Risk factors	Frequency	Percent
History of previous surgery	68	41.5
History of blood transfusion	78	47.6
History of dental treatment	120	73.2
History of IV drug use	90	54.9

Table-5: Frequency of occult hepatitis C infection was present in 7.3% healthy spouses.

		Frequency	Percent
Valid	Present	12	7.3
	Absent	152	92.7
	Total	164	100.0

Table 6 Data stratification was not significant for age groups (p-value 0.348), gender (p-value 0.099), deranged LFT (p-value 0.496), viral load (p-value 0.533), duration of marriage (p-value 0.120), duration of hepatitis C infection (p-value 0.305), previous surgery (p-value 0.066) previous blood transfusion (p—value 0.305) and dental treatment in spouse (p-value 0.597).

Table 6: Data stratification for age groups and occult hepatitis C infection in spouse

				Occult hepatitis C infection		Total
				Present	Absent	
Age groups	20-40 years	Count	Age	8	80	88
		% within groups		9.1%	90.9%	100.0%
	41-60 years	Count	Age	4	72	76
		% within groups				
				5.3%	94.7%	100.0%
p-value 0.348						

Data stratification was significant for presence of occult hepatitis C infection against history of drug use, p-value 0.040.

Table 7: Data stratification for gender and occult hepatitis C infection in spouse

			Occult hepatitis C infection		Total
			Present	Absent	
Gender	Male	Count	10	90	100
		% within Gender	10.0%	90.0%	100.0%
	Female	Count	2	62	64
		% within Gender	3.1%	96.9%	100.0%
p-value 0.099					

Table 8: Data stratification for deranged LFT and occult hepatitis C infection in spouse

			Occult hepatitis C infection		Total
			Present	Absent	
Deranged LFT	Yes	Count	4	66	70
		% within Deranged LFT	5.7%	94.3%	100.0%
	No	Count	8	86	94
		% within Deranged LFT	8.5%	91.5%	100.0%
p-value 0.496					

Table 9: Data stratification for viral load in patient and occult hepatitis C infection in spouse

		Occult hepatitis C infection		Total
		Present	Absent	

Viral load	Less 500IU/ml than	Count	6	62	68
		% within Viral load	8.8%	91.2%	100.0%
	More 500IU/ml than	Count	6	90	96
		% within Viral load	6.2%	93.8%	100.0%
p-value: 0.533					

Table 10: Data stratification for duration of marriage and occult hepatitis C infection in spouse and History of blood transfusion in spouse

			Occult hepatitis C infection		Total
			Present	Absent	
Duration marriage	Less than 5 years	Count	4	24	28
		% within Duration of marriage	14.3%	85.7%	100.0%
	More than 5 years	Count	8	128	136
		% within Duration of marriage	5.9%	94.1%	100.0%
p-value 0.120					
			Occult hepatitis C infection		Total
			Present	Absent	
History of blood transfusion in spouse	Yes	Count	4	74	78
		% within History of blood transfusion	5.1%	94.9%	100.0 %
	No	Count	8	78	86
		% within History of blood transfusion	9.3%	90.7%	100.0 %
p-value 0.305					

DISCUSSION

Worldwide, occult HCV infection is dispersed, and it appears that all HCV genotypes are involved. The blood transfusions, IV drug abusers, accidental needlesticks, and organ transplants and other parenteral contacts are the main routes by which the blood-borne hepatitis C virus (HCV) infection is spread[11-12]. There is still debate regarding the transmission of HCV through intermarriage and sexual activity. HCV can be transmitted through sexual contact, however less effectively than human immunodeficiency virus and hepatitis B[13-14]. This is according to epidemiological research (HIV). In all, 164 patients with a mean age of 38.611.7 years, a mean marriage length of 8.15.2 years, a mean viral load in patients of 348.2101.74IU/mL, and a mean duration of hepatitis C infection of 3.92.1 years were enrolled in our study. Patients made up of 39% women and 61% men. 42.7% of the patients had abnormal LFT. In the sampled group, 54.9% of spouses had a history of drug usage, 47.6% had a history of blood transfusions, 73.2% had a history of dental work, and 41.5% had a history of prior surgery. In 7.3% of healthy couples, occult hepatitis C infection was found[15]. Data stratification for duration of marriage and occult hepatitis C infection in spouse, previous surgery (p-value 0.066), prior blood transfusion (p—value 0.305), and dental treatment in spouse. Data stratification was not significant for age groups (p-value =0.350), gender (p-value 0.099), deranged LFT (p-value 0.496), viral load (p-value 0.533), duration of marriage (p-value 0.120), or duration (p-value 0.597). With a p-value of 0.040, data stratification was significant for the existence of occult hepatitis C infection against history of drug use[16-17]. Our findings agreed with those of other research. 50 Egyptian healthy spouses with chronic HCV-4 infection participated in a study (26 women and 26 men). The subjects' average age was 47.1± 9.8 years, and the average length of their marriage was 20.1± 11.2 years (median 19.5 years). 4% of people had occult HCV infection, and there was no discernible gender difference[18-19]. However, those with a history of STDs had a noticeably greater rate of concealed HCV infection. The occult HCV infection prevalence did not significantly correlate with either the length of the marriage or the frequency of sexual activity; the same was true for serum levels of ALT[20-21]. In one study, 141 Iranian intravenous drug users who had been diagnosed with HIV participated in a cross-sectional study[22-23]. The participants' average age was 38.9 8.3 years (range, 22-66 years). 153 (95.0%) of the 161 participants in the study were men. In 8.7% of the subjects, occult hepatitis C infection was found. In individuals with hematological problems, occult hepatitis C virus infections had a higher frequency (20%)[24]. According to a study conducted in Iran, 10% of individuals with cryptogenic liver disease had occult hepatitis C infection. 4.8% of patients receiving hemodialysis had an undetected case of hepatitis C. These researches support the findings of our investigation[25].

CONCLUSION

Occult hepatitis C infection is common in spouses of HCV patients. All patients presenting in OPD with HCV should be advised for screening of occult hepatitis C infection.

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