

Assessment of Knowledge Regarding Risk Factors of Hepatitis C Virus Transmission and Options to avoid them

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Abstract

Background: Hepatitis C Virus (HCV) is affecting 170 million people annually (WHO, 2012) and Pakistan ranks high in chronic hepatitis. HCV is a leading cause of chronic liver disease and hepatocellular carcinoma rapidly transmitting as silent killer.

Methods: Comparative cross-sectional facility based survey between HCV positive (n = 344) and negative (n = 176) respondents at Taluka Hospital (OPD), Rural District, Sindh using structured questionnaire and open ended questions. Analysis was done by cross-tabulation and Chi-square test.

Aim: To improve the knowledge of risk factors of HCV transmission.

Objectives:

1. To assess the knowledge regarding risk factors of HCV transmission.
2. To identify the options to avoid the risk factors associated with HCV transmission.

Results: A total of 520 respondents having 66% frequency of HCV infection were interviewed. Highest infection was in 21-30 years ages (39.0%) with more infection in urban population (75.6%) and illiterate group (52.9%), followed by farmers (30.5%) and laborer (26.7%). Majority of HCV positive respondents had misperceptions of water (11.3%; $P < 0.036$), food (10.3%; $P = 0.283$), heat (10.1%; ($P = 0.412$), and mosquitoes (9.9%; $P < 0.003$) as the major factors of HCV transmission. History of therapeutic injections/year (60%; $P < 0.0001$), surgery (80%; $P < 0.009$), shaving at barber's shop (64.2%; $P < 0.119$), sharing tooth brush, razor and miswak, (82%, 77% and 88.1% respectively; $P < 0.0001$, $P < 0.0001$, $P < 0.0001$) was more in HCV positive respondents. More family deaths due to hepatitis had occurred in HCV positive respondents. The qualitative component reinforced the findings of misperceptions. Respondents suggested launching auto disable, introducing disposable dental/surgical instruments and registering barber's shops with a policy to use new blade and razor for each customer.

Conclusion: There is health communication gap while getting care from health professionals during treatment of hepatitis. Health department should ensure health education and awareness sessions to remove the misperceptions of patients and prevention of transmission of the disease.

Key words: Hepatitis C, Risk Factors, Transmission, Knowledge, Misperceptions

Introduction and Background

Hepatitis C Virus (HCV) infection is now being recognized as a global health problem. Around 170 million people are chronically infected and 3 – 4 million are newly affected every year.¹ Most of the patients are asymptomatic till the disease is at its terminal stage posing a great danger to spread this infection silently.² There is currently no vaccine available for HCV infection prevention due to the high degree of strain variation.³ The highest chronic infection rate of Hepatitis C in Egypt (22%), Pakistan (4.8%) and China (3.2%).¹ Pakistan ranks high in chronic hepatitis mortality and according to Pakistan Medical Research Council (PMRC) hepatitis survey report (2009) the prevalence of HCV in general population is 5%.^{4,5}

A study conducted in Germany found major risk factor of injection drug use (IDU) for HCV transmission⁶ while in Afghanistan showed intravenous drug use (IVD), unsafe sexual activities and unsafe blood transfusions among the most prominent risk factors.⁷ Saudi Arabian surveillance report (2009) showed unscreened blood transfusion and IVD as major modes of transmission.⁸ A study (2010) on the prevalence of hepatitis C in Pakistan showed reuse of contaminated syringes, and surgical and dental treatment as the risk factors.⁹⁻¹¹ A study by Qureshi *et al.* (2009) reported injections, surgery and dental treatment as major risk factors in male patients¹² and a review of literature (2009) reinforced the findings.¹³

There are few published studies focussing on the knowledge of HCV infected patients and their perceptions on how to avoid the risk factors of the spread of infection. A two-country survey between Germany and Netherlands (2012) reported that practical knowledge regarding hepatitis C transmission, consequences, and prevention was very low in both countries.¹⁴ A study in Shanghai, China (2012) reported significant gaps in knowledge about HCV and HCV treatment received.¹⁵ A study from Korea (2011) found that the awareness about chronic liver disease is unsatisfactory among Korean adults.¹⁶ A study survey conducted in Izmir, Turkey (2011) reported that hairdressers' knowledge of HCV and HCV-prevention was inadequate.¹⁷ A Spanish study (2010) reported inappropriate knowledge about HCV routes of transmission, prevention and treatment.¹⁸

Although there have been multiple studies conducted in various areas of Pakistan, but no improvement have been seen since 1980 to 2013 due to low knowledge of hepatitis C infection and awareness about various associated risk factors.^{19,20} A study conducted in Mansehra, Khyber Pakhtoonkhwa (2010) showed that the HCV related knowledge and awareness among population was inadequate.²¹ The results of a study conducted in Bara Koh, Islamabad (2010), Hyderabad (Sindh) (2010) and Nawabshah, Sindh (2007) showed that the knowledge regarding the risk factors of hepatitis C was poor.²²⁻²⁴

A study conducted in Pakistan's Sindh province reported that people's lack of awareness of risks associated with injections and their strong belief in the quick action of injection for disease treatment was the cause of injections overuse. These factors are supplemented by general practitioners and unqualified providers inclinations to prescribe more injections.²⁵ A study conducted at Rawalpindi and Islamabad regarding knowledge and practices of barbers about Hepatitis C transmission reported that the level of awareness among barbers was very low and their practice of razor reuse was very common.²⁶

There have been several studies done in Pakistan regarding prevalence of HCV and the risk factors but due to the high rate of spread of the disease in Sindh province, this particular study was up taken to take the views of native patients themselves getting treatment from the health professionals to find the gaps in their level of awareness of hepatitis. The purpose of the study was to find the solutions from them who are undergoing treatment to bring into light some important information to bridge these gaps and prevent the spread of the disease.

Aim

To improve the knowledge of risk factors of HCV transmission.

Objectives

1. To assess the knowledge regarding risk factors of HCV transmission at Taluka Hospital, district Jacobabad, Sindh.
2. To identify the options to avoid factors associated with HCV transmission at Taluka Hospital, district Jacobabad, Sindh.

Methodology

A comparative cross sectional facility based study conducted at Taluka Hospital, district Jacobabad, Sindh, Pakistan. The study population included patients above 18 years of age. Structured questionnaire and open ended questions were used. There were 26 In-depth Interviews (5%), including 20 male respondents (10 HCV Positive: 10 HCV Negative) and 6 female respondents (3 HCV Positive: 3 HCV Negative) through randomization. Cross-tabulation and Chi-square test was used for analysis.

Results

A total of 520 respondents (Male: 438, Female: 82) with mean age of 32.4 years (18 – 60 yrs) and mean income of Rs.7201 (Rs. 3000 – 100,000) were interviewed. Overall frequency of HCV infection was 66% in the study population with significantly higher frequency in the females (63: 78%).

Socio-Demographic Characteristics

According to age sub-groups highest frequency of infection was in 21-30 year ages (39.0%). There were 63.3% respondents who were diagnosed with HCV through routine screening, 21.5% while blood donation and 2.9% before surgical procedure. Majority of infection was reported in urban population (75.6%), in married respondents (88.4%) and illiterate group (52.9%). There was higher frequency in farmers (30.5%) followed by laborer (26.7%). Although there was large variation in household income of the respondents but high HCV frequency was observed in very low income group of Rs. <7000 (77.6%). Age ($P < 0.003$), residence ($P < 0.0001$), ethnicity ($P < 0.001$), education ($P < 0.0001$) and professional ($P < 0.0001$) status of respondents was significantly associated with hepatitis C Status (Table 1).

Knowledge of Risk Factors Towards Hcv Transmission

The overall knowledge of respondents was reasonable but majority of HCV positive respondents had misperceptions about its transmission. They stated water (11.3%; $P < 0.036$), food (10.3%; $P = 0.283$), heat (10.1%; $P = 0.412$) and mosquitoes (9.9%; $P < 0.003$) to be the major factors of HCV transmission. The results further indicated that frequency of HCV negative respondents was more who rightly perceived that the disease transmits through Barber's shaving instruments (13.2%; $P < 0.0001$), dental instruments (13%; $P < 0.0001$), blood transfusion (12.7%; $P < 0.0001$), reused needles/injections (11.9%; $P < 0.0001$) and surgical instruments (11.8%; $P < 0.0001$) (Table 2)

Family History of HCV Infection

Family history of HCV infection was more (Table 3) in HCV positive respondents as well as deaths of mother ($n = 4$, 1.2%), father ($n = 8$, 2.3%), son ($n = 10$, 2.8%), spouse (39, 11.3%) and others relatives ($n = 100$, 29.1%). due to hepatitis C in the immediate family members ($n = 163$). There were only 15 deaths in family members of HCV negative respondents ($P < 0.0001$).

Practices

Use of therapeutic injections was significantly more in HCV positive respondents' ($P < 0.0001$) along with history of blood transfusions although not statistically significant ($P = 0.23$). Any surgical intervention ($P < 0.009$) was significantly associated with hepatitis C as well as sharing of toothbrushes ($P < 0.0001$), razors ($P < 0.0001$) and miswak ($P < 0.0001$) (Table 4).

Qualitative Data Analysis

The qualitative component reflected depth of views perceived by respondents' and three major themes and thirteen sub themes were developed through content analysis (Table 5).

True Perceptions of HCV Transmission Risk Factors

The risk factors identified for HCV transmission were:

a. Dental And Shaving Instruments

Many respondents supported the fact that unsterilized use of dental instruments can be a reason for the rapid spread of HCV disease. According to some respondents unregistered dentists (quacks) were responsible for this kind of transmission of HCV by unethical use of dental equipment. The respondents also had clear idea that reused blades and razors caused spread of HCV disease through cuts at barbers shop from infected to non-infected individuals.

b. Blood Transfusion

Respondents reported that blood was not being tested for hepatitis C before transfusion in their area causing spread of HCV disease.

c. Re-Used Syringes And Surgical Instruments

The respondents were well aware that when syringes are reused in clinical settings, they can cause harm to other patients. During the treatment of indoor patients, doctors use surgical instruments which sometimes act as weapons to spread HCV disease. When HCV positive patient gets surgical operation with the same surgical instrument, it becomes a source of HCV transmission, e.g. in case of delivery.

d. Sexual Relations

Most of the participants stated that (extra-marital sexual relations) was an important cause of spread of the disease.

Myths and Perceptions Of HCV Transmission

Some HCV positive respondents, in spite of getting treatment for long time from doctors still had multiple misperceptions about spread of HCV infection. The respondents reported Hepatitis C is spreading due to extreme heat and mosquitoes

Options to Avoid Risk Factors

Respondents were asked to give options to avoid the risk factors of HCV transmission. Options stated were diverse as illustrated below:

- Avoiding sharing of utensils, drinking and eating with HCV patients
- Taking syrups instead of injections/ drip
- Patient should bring his/her own syringe
- To practice shaving at home
- Blood screening before transfusion from a registered blood bank

Community Awareness Programs

The respondents pointed out following initiatives to prevent HCV infection:

- Community leaders should be trained to conduct weekly meetings for HCV awareness programs
- Organize seminars, workshops on HCV prevention at schools and colleges
- Distribute pamphlets and brochures at schools, colleges, mosques, shops, railway stations, bus stands, bazaars and community halls stating precautions and risk factors

Role of Health Department

- Doctors should be trained to educate, counsel patients
- Launch a public health awareness program unit for HCV at every hospital
- District health department should send a team of doctors for delivering sessions on HCV prevention at secondary and higher secondary schools of district to convey knowledge to save the new generation
- Launch auto disable syringes, launch disposable dental and surgical instruments
- Provision of free of cost blood screening for all patients
- Free treatment of HCV infected patients
- Registration of barber's shop and formulation of a policy to use a new blade/razor every time
- Strict penalties for illegal practice by unregistered dentists/ doctors (Quacks)
- Talk shows (TV and Radio) and live question answer session through mass media
- Train LHWs, LHVs, vaccinators, and supervisors for door to door awareness programme

Discussion

Hepatitis C is a major public health issue across the world.²⁷ The prevalence of HCV in general population of Pakistan is 5.0%, while 5.0% in Sindh 5.3% in Jacobabad affecting around 87,000 people (Pakistan Medical Research Council Survey Report; 2009).²⁸ The present study results showed frequency of 66% infection in the study population, higher from the district, provincial

and national level. Majority of the study participants were male (84 vs. 16%). Although there was a male predominance in the respondents but the frequency of HCV was significantly more in the females (78 vs. 64%). The study results reinforced the findings of another study conducted by Gias *et. al.* in Punjab, showing 72 vs. 66% HCV frequency in female population.²⁹ This indicated that females were more likely to have the risk of disease most probably due to their role in child birth etc.

Majority of the HCV positive respondents belonged to younger age group of 21 - 30 years (39%) followed by 31 - 40 years (34.3%) ($P < 0.003$). These study findings are similar to the study conducted in Sindh by Talpur *et. al.*²⁴ showing that 78% younger respondents (10 - 40 yrs). Most of the respondents belonged to urban area (75 vs 24%) ($P < 0.0001$), may be due to the reason that study was conducted at a health facility and not at community level. There were 88 % married HCV positive respondents reinforcing the findings in a study conducted by Gias *et.al.* in Punjab²⁹ showing 90% prevalence in married groups. Most of the respondents (43%) belonged to Sindhi community ($P < 0.0001$) because of the location where the study was conducted.

The higher frequency of HCV infection (77.6%) was found to be associated with low socio-economic status similar to the study conducted by Gias *et. al.* in Punjab showing $> 51\%$ prevalence associated with lowest income group.²⁹ Most of the HCV positive respondents were illiterate 53% vs. 8.1% ($P < 0.0001$). Data showed that the knowledge and awareness about HCV risk factors was more among educated individuals showing more than 52% illiterate/less educated HCV respondents. These findings are similar to the study by Talpur *et. al.*²⁴ in Nawabshah, Sindh (76% illiterate). A large group of participants were farmers (30.5%) followed by laborers (26%) showing more HCV frequency in illiterate group of people who were working as laborers having poor knowledge about hepatitis C transmission ($P < 0.0001$).

The cross tabulation analysis and chi-square test results showed that prior exposure of dental procedures ($P < 0.0001$), barber's shaving instruments ($P < 0.0001$), blood transfusions ($P < 0.0001$), surgical instruments ($P < 0.0001$), reused needles/injections ($P < 0.0001$), patient's history of practicing needles/injections ($P < 0.0001$), and history of surgery ($P < 0.009$) were all significantly associated with status of HCV. Similarly sharing of toothbrush, razor and miswak were all significantly associated with status of HCV⁹. Majority of HCV positive study respondents showed a lack of knowledge regarding mode of transmission of disease comparable to the studies conducted by Crutzen *et. al.* in Germany and Netherland.¹⁴ The studies done in China¹⁵, Korea¹⁶, Turkey¹⁷, Spain¹⁸ and USA³⁰ also showed poor knowledge in the community regarding HCV transmission. Although there have been multiple studies conducted on HCV prevalence and knowledge regarding risk factors in Pakistan but the present study results show that HCV related awareness among population is still inadequate.

The results revealed more misperceptions and poor knoweldege about hepatitis C transmission in infected individuals in spite of doctor being the main source of information as compared to HCV negative respondents which may lead to the rapid spread of disease. The misperceptions of transmission were through water (11.3%), food (10.3%), heat (10.1%) and mosquitoes (9.9%). Interestingly HCV positive respondents also had poor knowledge of the true HCV risk factors as compared to HCV negative respondents similar to the study conducted by Jokhio *et. al.* in Sindh³¹, showing that only 20.4% respondents were aware that HCV spreads through dental instruments.

Most of blood banks in Jacobabad provide blood from relatives and professional blood donors and lacked proper equipments for blood screening for HCV infection. This study reported that 10.4% respondents were aware of HCV spread through blood transfusion more than the study conducted by Talpur *et. al.* in Sindh²⁴, showing awareness in 3.4% respondents. The study illustrated that only 10.2% of HCV respondent were aware that it spreads through contaminated surgical instruments less than the study conducted by Jokhio *et. al.* in Sindh³¹, showing that only 24.7% respondents were aware that HCV spreads through dental instruments. The results revealed that 60% of HCV respondents were habitual to have therapeutic injections (≥ 10 times) showing people's lack of awareness of this risks and their strong belief in getting fast relief through injections. It had been reported in earlier studies by Janjua *et. al.*²⁵ and Kwiatkowski *et. al.*³⁰ that the patients who received more injections were more likely to be infected.

The results showed an alarming situation that 88.1% HCV positive respondents were sharing miswak, 82.6% toothbrush and 77% razor (Paki) with others as reported by Qureshi *et. al.* and Tiftikci and co-workers.^{20,55} The family members of HCV positive respondents diagnosed with HCV were 60.7% male and 37.5% female also reported by Gias *et. al.*²⁹ showing more than 76% family members diagnosed with HCV infection. The affectees in the present study were 29.1% (uncles, cousins, and sisters) and out of these 11.3% had died of HCV disease. While a study conducted by Mustafa *et. al.*³² showed 8% HCV family members suffering from HCV and 10% had died.

In the qualitative analysis the risk factors outlined by respondents were not all supported medically and in spite of having knowledge of certain important risk factors but were not being practiced. This was similar to the study conducted by Hassan *et. al.*³³ in Egypt where poor knowledge and negative attitude regarding the lifestyle changes of hepatitis C patients was reported. There were more misperceptions in majority of the respondents reporting unhygienic food and impure water being the basic cause of transmission of HCV similar to the study conducted by Akhund *et. al.*³⁴ in rural Sindh and Iqbal in Islamabad³⁵. Since the study area is the hottest place of Asia, some respondents misperceived that hot weather was the main reason of spread of HCV disease. This area also has a problem of mosquitoes due to unclean environment therefore some respondents' misperceived mosquitoes to be cause of spread of HCV. These findings support the study conducted by Osorio *et. al.* in Spain where misperceptions and wrong perceptions of liver disease were reported.¹⁸

The options to avoid HCV risk factors and transmission suggested by the respondents were to avoid drinking and eating with HCV patients and preferred shaving at home. Some supported the option to take syrups instead of injections to save the community and proper sharing of information by physicians and public health professionals during consultations. In a study conducted by Noureen Jiwani³⁶ in Sindh respondents supported dissemination of information through community leaders in their respective areas. Some young respondents suggested that district health department should send team of doctors to deliver awareness sessions at district schools. A study conducted by Mustafa *et. al.*³² in Sindh and Lindsay *et. al.*³⁷ in Australia supported health awareness programs and educational workshops for teachers and students. Another option suggested was to train the quacks regarding HCV infection and transmission

similar to the study conducted by Janjua *et. al.*²⁵ in Sindh who reported training of unqualified practitioners' to reduce injection overuse in Pakistan.

Conclusion

Although there are two Hepatitis Control Programs working in the study area of Jacobabad; Prime Minister's Program and Chief Minister's Program due to high prevalence in the area, the knowledge of HCV risk factors and options to avoid further transmission of the disease is still inadequate. In spite of having consults with the doctors, HCV infected respondents have deficit knowledge of the spread of disease. Majority of the suggestions provided by respondents were practical to reduce further transmission of the disease. If people are well-informed and vigilant enough about HCV related health issues we can avoid the spread of disease.

Recommendations

- Educational sessions and health awareness programs to raise awareness in the community through seminars, electronic and print media.
- Encourage doctors to do health education sessions during their consultation.

LIMITATIONS

- The study was done at a Taluka hospital where Gastroenterology Department was present, might be the reason of high frequency of HCV infection.
- Only respondents with Hepatitis screening done already were included in the study due to budget constraints.

Conflict Of Interest

The authors declare that there is no conflict of interests regarding the publication of this article. There are no competing financial interests of the institutions or authors.

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Table 1: Socio-demographic characteristics of the respondents.

Age Groups in years	Status of Hepatitis C		P-Value
	HCV Positive n (344)	%	
< 20	40	11.6	.003*
21-30	134	39.0	
31-40	118	34.3	
41-50	34	9.9	
51- 60	18	5.2	
Residence			
Urban	260	75.6	.000*
Rural	84	24.4	
Marital Status			
Married	304	88.4	0.299
Unmarried	34	9.9	
Widow	4	1.2	
Separated	2	0.6	
Education			
Illiterate	182	52.9	.000*
Primary	58	16.9	
Middle	44	12.8	
Matric	32	9.3	
Higher	28	8.1	
Profession/Occupation			
Government service	20	5.8	.000*
Private service	29	8.4	
Farmers	105	30.5	
Jobless	33	9.6	
Laborer	92	26.7	
Housewives	23	6.7	
Students	28	8.1	
Other	14	4.1	
Monthly Income (Rs)			
<7000	267	77.6	.335
7000 – 10,000	27	7.8	
10001 – 15000,	19	5.5	
15001 and above	31	9.0	

*Statistically Significant $p < 0.05$.

Table 2: Knowledge of risk factors responsible for HCV transmission.

HCV Risk factors	Status of Hepatitis C	P-Value
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	Over all n (520) %	HCV Positive n (344) %	HCV Negative n (176) %	
Dental Instruments	12.1	11.5	13.0	.000*
Barber's Shaving Instruments	11.7	10.9	13.2	.000*
Blood Transfusion	11.3	10.4	12.7	.000*
Surgical Instruments (Razor)	10.8	10.2	11.8	.000*
Reused Needles/Injections	8.1	5.8	11.9	.000*
Water	10.1	11.3	8.2	.036*
Food	9.5	10.3	8.1	.283
Heat	9.3	10.1	8.1	.412
Mosquitoes	8.6	9.9	6.4	.003*
Flies	8.5	9.6	6.6	.016*

*Statistically Significant $p < 0.05$

Table 3: Gender of family members diagnosed with HCV

Gender	Family members diagnosed with HCV	Status of Hepatitis C				P-Value
		HCV Positive n (344) %	HCV Negative n (176) %			
Male	Yes	170	60.7	34	21.5	.000
	No	102	36.4	118	74.7	
	Don't know	8	2.9	6	3.8	
Female	Yes	24	37.5	6	33.3	.331
	No	34	53.1	12	66.7	
	Don't know	6	9.4	0	0.0	

*Statistically Significant $p < 0.05$

Table 4: History of practices of respondents

History of Patients	Status of Hepatitis C				P-Value	
	HCV Positive		HCV Negative			
	n (344)	%	n (176)	%		
Therapeutic Injections/year						
	<5	71	20.6	98	55.7	.000*
	06-10	44	12.8	38	21.6	
	>10	209	60.8	22	12.5	
	Never	20	5.8	18	10.2	
Blood Transfusion						
	Once	16	4.7	3	1.7	0.236
	Twice	8	2.3	2	1.1	
	Thrice	2	.6	2	1.1	
	Never	318	92.4	169	96.0	

Surgical History					
Yes	53	80.3	13	19.7	.009*
No	291	64.1	163	35.9	
Shaving at barber's shop					
Yes	248	64.2	138	35.8	0.119
No	96	71.6	38	28.4	
Tooth brush					
Yes	76	82.6	16	17.4	.000*
No	268	62.6	160	37.4	
Razor					
Yes	154	77	46	23	.000*
No	190	59.4	130	40.6	
Miswak					
Yes	74	88.1	10	11.9	.000*
No	270	61.9	166	38.1	

*Statistically Significant $p < 0.05$

Table 5: Themes and sub-themes for In-depth Interviews

Major Theme 1 True Perceptions of HCV Transmission Risk Factors	Major Theme 2 Myths/Misperceptions of HCV Transmission	Major Theme 2 Emerging Themes Options to avoid Risk Factors
Sub-Theme	Sub-Theme	Sub-Theme
1. Dental Instruments	1. Unhygienic food and water	1. Public Perceptions
2. Shaving Instruments	2. Hot weather	2. Community Awareness Program
3. Unscreened blood transfusion	3. Mosquitoes	3. Role of Health Department
4. Surgical Instrument	4. Practice wrong acts	
5. Re-used Syringes		