Frequency of Various Risk Factors in HCV Positive Patients in Initial Diagnostic Phase

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Abstract

Viral hepatitis C is a type of illness, which is transmitted to patients by different methods in world. Here we will identify the different common risk factors for transmission of viral hepatitis C in our setup. Aim of study was to determine frequency of various risk factors in HCV positive patients. This study was cross sectional and conducted Department of Medicine PMC Hospital at Nawabshah. Duration of this study was one year from April 2016 to March 2017. After taking informed written consent, 243 diseased persons with positive anti Hepatitis C Antibodies were incorporated in this research. Frequency of variables *i.e.* Hepatitis C virus risk factors and different other demographic results was collected on preformed proforma. In total of 243 subjects there were 165 (67.9%) male and 78 (32.1%) females respectively. Most of the subjects have more than one risk factor. 19 (7.8%) had history of blood and blood products transfusion. IV drug abuse was detected in 08 (3.3%). Homosexuality and heterosexuality were observed in 14 (5.8%) and 12 (4.9%) subjects respectively. History of dental procedure was seen in 31 (12.8%). 228 (93.8%) had history of needle pricking in different ways. History of different surgical procedures was observed in 33 (13.8%). Calculated Mean and Standard Deviation for age was 39.2 ± 10.3 years. It was concluded that proper implementation of precautionary measures should be carried out for every human being to reduce burden of HCV illness in far near future.

Keywords

Viral Hepatitis C, Anti HCV Antibodies, Risk Factors

1. Introduction

HCV (Hepatitis C virus) is widely spread in Islamic Republic of Pakistan and its load is anticipated to extend in upcoming decades due to extensive use of insecure medical practices. The occurrence of Hepatitis C virus infection in Pakistan had been evaluated in past and about 86 such researches were found in literature. Therefore, an improved modernized study was required to integrate the new information. A precise audit of information performed in vicinity of 2010 and 2015 demonstrated that HCV sero-prevalence amongst the common adult Pakistani populace was 6.8%, while recent data on HCV established was around 06.0% of the populace. In most surveys, it was indicated that HCV infection was high in rural and peri urban areas (up to 25%) [1]. Disease with hepatitis C virus (HCV) is a noteworthy worldwide wellbeing concern. It is expected that about 170 million individuals are contaminated with HCV around the world, this ailment is turned out to be a heightening financial, social and wellbeing trouble [2] [3]. The weight of this sickness in a significant number of the developed and developing nations is consistently on the ascent [3]. Despite the fact that pervasiveness of HCV infection appears to have declined in the previous two decades in the vast majority of the developed nations of world like, USA, Europe (Western and Northern), Australia and Japan [4]-[9]. The occurrence of HCV differs by area. HCV occurrence less than 2% was noted in areas as America, Europe (Western) and Australia, while zones with the most astounding HCV infection are Africa and the Mediterranean (eastern) [10]. Hepatitis C Virus belongs to the family Flaviviridae with an around 9.6 kb, single-stranded RNA genome. Due to poor constancy of HCV RNA dependent NS5B protein, the virus displays an abnormal state of arrangement heterogeneity [11]. In light of grouping homology six noteworthy HCV genotypes (1 - 6) and various distinctive subtypes e.g. 1b, 3a and so forth, have so far been recognized [12]. Hepatitis C is the main source for end stage liver disease, including HCC (Hepatocellular carcinoma) and requirement for liver transplantation; recurrence of these were anticipated to build up 2 - 3 folds by 2030 [13]. Increased hazard of injection practices are the main source of HCV disease among drug abusers [14]. There were almost 13.2 million drug abusers around the world [15], and half of them appear to had been infected with HCV [16]. In Pakistan, there are different risk factors as compared to rest of globe. HCV infection transmission is usually related to infected blood (blood products), drug addicts (intravenous), and needle pricking mostly accidentally or peri-natal. Vertical and sexual routes are also reported as less frequent causes of HVC transmission [13].

This study was conducted at department of medicine Peoples Medical College Hospital Nawabshah, to identify the different risk factors in 243 anti HCV antibodies positive cases by ELISA. I believe that results of our study will be helpful in reduction of financial burden, quick identification and therefore reduce the morbidity and mortality. This study will be helpful for those who intend to do research work on chronic HCV infection, as well as for practicing physicians.

Current research was aimed to identify different hazard factors among patients with HCV infection by analyzing their impact in our local community setup.

2. Materials and Methods

2.1. Design and Participants

This research (cross sectional) was carried out from April 2016 to March 2017, at the department of medicine PMC Hospital Peoples University of Medical and Health Sciences, all subjects from the local reporting community with sero-positive HCV antibodies were recruited for risk factor assessment. Sample size was 243 subjects, calculated by Rao-software calculator, with margin of error 5, CI 95 from total population about 1.6 Million. Different risk factors were identified in HCV positive cases from both genders aged between 18 to 60 years. All patients who visited first time and diagnosed as HCV positive willing for interview for identification of various risk factors were included in study. HCV patients with HbsAg and HIV were included in study. HbsAg and HIV without HCV were excluded. The monthly incomes of parents of all volunteers were divided into three categories. Income <Rs: 20,000/m (lower income class/Poor Peoples), Income <Rs - 27,000 (middle income class) and Income >Rs 28,000 (middle upper income class). Various risk factors with the help of available data like, Needle pricking barber shave, dental procedures, blood transfusion, homosexuality and heterosexuality Blood and its products, IV drug addiction dialysis, tattoo marks and HCV positive mothers were documented. Written informed consent was taken, risk stratification done based on history/interview and data was entered in the pre designed proforma.

2.2. Questionnaire

Trained doctors having perfect knowledge of subjects were involved to collect statistics by filling a proforma through interviews. Different demographic variables as history of drug abuse, and risk factor knowledge were included in proforma. Prior to enrollment, all the details were explained to the subjects and queries of subjects were explained them in detail for their satisfaction to participate in study.

2.3. Ethical Considerations

This study was carried out after permission of ethical committee; confidential information was collected from the subjects. After taking written consent the subjects were explained in detail regarding aims, risks, and positive outcome of playing a part in research. All of them were permitted to vacate the research at any moment.

2.4. Statistical Analysis

Variables (Continuous and Categorical) were evaluated for mean ± SD, frequency and percentage. The relationship among HCV condition and related risk

issues were described as OR (odds ratio) and 95% CI (confidence interval). Variables with P ≤ 0.05 were considered as significant. SPSS 20 version was adopted for collected information.

3. Results

In recent study there were total 243 patients of different age groups, all were Anti HCV antibodies positive; 165 (67.9%) of these males and 78 (32.1%) were from female gender. The mean age of subjects was 36.93 years with SD 11.347, minimum 18 years and maximum 60 years.

3.1. Demographic Variables

Patients were arranged in two age intervals, 146 (60.1%) were between 18 and 40 years and 97 (39.9%) were between 41 and 60 years. Married subjects were 230 (94.7%) and 13 (5.3%) were unmarried. In educational status 70% (170) educated and 30% (73) were uneducated. A majority of patients 186 (76.1%) belonged to rural community and 58 (23.9%) were from urban areas. no occupation in 39 (16%) subjects, most of patients 109 (44.9%) were manual workers, 78 (32.1%) house wives and 17 (7%) office workers. Large population of subjects were from lower class 217 (89.3%), 21 (12.8%) from middle and only 5 (2.1%) subjects were from upper economical class Figure 1.
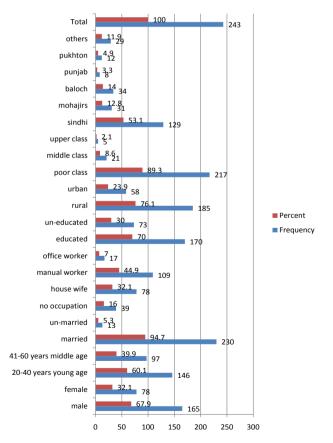

Figure 1. Demographic variables (risk factors) of viral hepatitis C. n = 243.

3.2. Risk Factors for Hepatitis C

Regarding the assessment of risk factors it was analyzed that most of the subjects have more than one risk factor. 19 (7.8%) had history of transfusion (blood and blood products), out of them 15 males and 04 were females. IV drug abuse was detected in 8 (3.3%), out of them 07 males and 01 female. Homosexuality and heterosexuality was observed in 14 (5.8%) and 12 (4.9%) subjects respectively. history of dental procedure was seen in 31 (12.8%) with dominant male sex 24/31. Majority of subjects *i.e.* 228 (93.8%) had history of needle pricking in different ways, out of these 154 male and 74 were females. History of different surgical procedures was observed in 33 (13.8%) out of them females were 25 and 08 were male.

Out of 78 females 13 (16.66%) female were un-married, while 25 (32.05%) had history of safe delivery and 40 (51.28%) had practiced home delivery. Only 01 (0.4%) subject included in our study was on dialysis. Second most important risk factor among male was shaving from barbers present in 121 (49.8%) out of 178 male subjects. Tattoo marking observed in 10 (4.1%) and in 4.1% (10) of patients their mothers have positive history of HCV in past Table 1.

3.3. Co-Morbidities

Regarding the presence of co-morbidities it was observed that Hypertension, HBsAg, Diabetes Mellitus, Alcoholism and Smoking were associated with frequency of, 15 (6.2%), 21 (8.6%), 18 (7.4%), 9 (3.7%) and 35 (14.4%) respectively Table 1.

3.4. Correlation of Different Risk Factors with HCV

The typical thing in our research was that in majority of patients there were more than one risk factor. IV drug addiction was less common in our locality, surgical and dental procedures, barber shave, safe delivery, needle prick and tattoo marks were special matter of concern to control. Pearson Correlation Sig. (2-tailed) of HCV was related to various risk factors which were statistically at significant levels. The correlation of blood and its products was not significant because of safe transfusion methods now a day due to proper screening of donors. Hepatitis C was a matter of concern in homosexual as well as heterosexuals. The correlations of various risk factors were shown in Table 2.

3.5. Statistical Analysis of Risk Factors

In present study male subjects were with dominant ratio. Needle pricking, barber shave, dental procedures, blood transfusion, homosexuality and heterosexuality were identified and risk stratified statistically for Pearson chi square, continuity correction, likelihood ratios, fisher extract and linear to linear associations in male and female subjects. Values like Pearson chi square, continuity correction, likelihood ratios, and fisher extract and linear to linear associations for heterosexual, homosexuals, surgical procedures, safe delivery, barber shave

Table 1. Statistics of HCV risk factors and co-morbidities. n = 243.

Risk Factors for HCV	Yes/No	Frequency	Percent	Chi-Square	df	Asymp. Sig.
Blood Product Transfusion	yes	19	7.8	172.942	1	0.000
	no	224	92.2			
Iv Drug Addict	yes	8	3.3	212.035	1	0.000
	no	235	96.7			
Heterosexual	yes	12	4.9	197.370	1	0.000
	no	231	95.1			
Homosexuality	yes	14	5.8	190.226	1	0.000
	no	229	94.2			
Dental Procedures	yes	31	12.8	134.819	1	0.000
	no	212	87.2			
Needle Pricking	yes	228	93.8	186.704	1	0.000
	no	15	6.2			
Surgical Procedure	yes	33	13.6	128.926	1	0.000
	no	210	86.4			
Safe Delivery	yes	25	10.3	153.288	1	0.000
	no	218	89.7			
Dialysis History	yes	1	0.4	239.016	1	0.000
	no	242	99.6			
Barber Shave	yes	121	49.8	.004	1	0.949
	no	122	50.2			
Tattoo Marking	yes	10	4.1	204.646	1	0.000
	no	233	95.9			
Patient Mother HCV +Ve	yes	10	4.1	204.646	1	0.000
	no	233	95.9			
Co-morbidity						
Hypertension	yes	15	6.2	186.704a	1	0.000
	No	228	93.8			
HBsAg	yes	21	8.6	166.259a	1	0.000
	No	222	91.4			
HIV	yes	243	100.0	Chi-square not applicable		
	No	0	0.0			
Diabetes Mellitus	yes	18	7.4	176.333	1	0.000
	No	225	92.6			
Alcoholism	yes	9	3.7	208.333	1	0.000
	No	234	96.3			
Smoking	yes	35	14.4	123.165	1	0.000
	No	208	85.6			

Table 2. Correlation between different risk factors in subjects with HCV. n = 243.

Risk Factor	Statistical test	Blood/ Products Transfusion	Iv Drug Addict	Hetero-sexual	Homo-sexuality	Dental Procedures	Needle Pricking	Surgical Procedure	Safe Delivery	Dialysis History	Barber Shave	Tattoo Marking	Patient Mother Hcv + Ve
Blood/ Product Transfusion	Pearson Correlation	1	0.032	0.004	0.06	0.026	0.075	−0.071	−0.048	−0.019	0.047	0.017	0.017
	Sig. (2-tailed)		0.618	0.946	0.355	0.681	0.246	0.272	0.455	0.772	0.464	0.794	0.794
Iv Drug Addict	Pearson Correlation	0.032	1	0.064	0.053	0.068	0.047	−0.073	−0.062	−0.012	0.139*	−0.038	0.078
	Sig. (2-tailed)	0.618		0.317	0.408	0.293	0.463	0.256	0.332	0.854	0.03	0.553	0.226
Hetero-sexual	Pearson Correlation	0.004	0.064	1	−0.056	0.198**	0.058	−0.09	−0.077	−0.015	0.153*	0.048	−0.047
	Sig. (2-tailed)	0.946	0.317		0.382	0.002	0.364	0.16	0.231	0.82	0.017	0.453	0.464
Homo-sexuality	Pearson Correlation	0.06	0.053	−0.056	1	−0.042	0.063	−0.046	−0.084	−0.016	0.107	−0.051	−0.051
	Sig. (2-tailed)	0.355	0.408	0.382		0.519	0.325	0.471	0.193	0.805	0.096	0.427	0.427
Dental Procedure	Pearson Correlation	0.026	0.068	0.198**	−0.042	1	0.098	−0.044	−0.008	−0.025	0.014	0.169**	−0.079
	Sig. (2-tailed)	0.681	0.293	0.002	0.519		0.127	0.499	0.905	0.703	0.829	0.008	0.219
Needle Pricking	Pearson Correlation	0.075	0.047	0.058	0.063	0.098	1	0.102	0.087	0.016	0.016	0.053	0.053
	Sig. (2-tailed)	0.246	0.463	0.364	0.325	0.127		0.114	0.177	0.798	0.803	0.41	0.41
Surgical Procedure	Pearson Correlation	−0.071	−0.073	−0.09	−0.046	−0.044	0.102	1	0.815**	0.162*	−0.251**	0.220**	−0.082
	Sig. (2-tailed)	0.272	0.256	0.16	0.471	0.499	0.114		0	0.011	0	0.001	0.202
Safe Delivery	Pearson Correlation	−0.048	−0.062	−0.077	−0.084	−0.008	0.087	0.815**	1	−0.022	−0.310**	0.203**	−0.07
	Sig. (2-tailed)	0.455	0.332	0.231	0.193	0.905	0.177	0		0.736	0	0.001	0.276
Dialysis History	Pearson Correlation	−0.019	−0.012	−0.015	−0.016	−0.025	0.016	0.162*	−0.022	1	−0.064	−0.013	−0.013
	Sig. (2-tailed)	0.772	0.854	0.82	0.805	0.703	0.798	0.011	0.736		0.32	0.836	0.836
Barber Shave	Pearson Correlation	0.047	0.139*	0.153*	0.107	0.014	0.016	−0.251**	−0.310**	−0.064	1	−0.082	−0.041
	Sig. (2-tailed)	0.464	0.03	0.017	0.096	0.829	0.803	0	0	0.32		0.203	0.529
Tattoo Marking	Pearson Correlation	0.017	−0.038	0.048	−0.051	0.169**	0.053	0.220**	0.203**	−0.013	−0.082	1	−0.043
	Sig. (2-tailed)	0.794	0.553	0.453	0.427	0.008	0.41	0.001	0.001	0.836	0.203		0.505
Patient Mother HCV + Ve	Pearson Correlation	0.017	0.078	−0.047	−0.051	−0.079	0.053	−0.082	−0.07	−0.013	−0.041	−0.043	1
	Sig. (2-tailed)	0.794	0.226	0.464	0.427	0.219	0.41	0.202	0.276	0.836	0.529	0.505	

and tattoo marks were statistical significant. Blood and its products, IV drug addiction, needle pricking, dialysis and HCV positive mothers were statistically insignificant as shown in Table 3.

4. Discussion

Pakistan is a country where majority of population is from low socioeconomic class and facing a lot of health related problems. Educational profile is still low in rural areas while improving in urban areas. Nowadays government of Pakistan is

Table 3. Statistical analysis of various risk factors in relation to gender in hepatitis C positive cases. Cross tabulation. n = 243.

Variable	Male		Female		Total	Pearson Chi-square Asymp Sig. (2-sided)	Continuity Correction Asymp Sig. (2-sided)	Likelyhood Ratio Asymp Sig. (2-sided)	Fisher extract Exact Sig. (2-sided)	L/L Associations Asymp. Sig. (2-sided)
	Yes n	No n	Yes n	No n						
Blood & Blood products	15	150	4	74	243	0.283	0.413	0.266	0.443	0.284
IV drug Addict	7	158	1	77	243	0.277	0.411	0.191	0.422	0.228
Heterosexual	12	153	0	78	243	0.015	0.034	0.002	0.011	0.015
Homosexual	14	151	0	78		0.008	0.019	0.001	0.006	0.008
Dental Procedures	24	141	7	71	243	0.224	0.313	212	0.303	0.225
Needle Pricking	154	11	74	4	243	0.642	0.857	0.637	0.780	0.642
Surgical Procedure	8	157	25	53	243	0.000	0.000	0.000	0.000	0.000
Safe Delivery	0	0	24	54	78	0.000	0.000	0.000	0.000	0.000
Dialysis	1	164	0	78	243	0.491	10.000	0.378	10.000	0.492
Barber Shave	121	44	0	78	243	0.000	0.000	0.000	0.000	0.000
Tattoo Marks	4	161	6	72	243	0.054	0.113	0.064	0.080	0.054
Patient Mother HCV +Ve	5	160	5	73	243	0.216	0.372	0.231	0.298	0.217

directly involved to control and treat hepatitis C at national level. Present research deeply concerned with wide spreading of viral hepatitis C in population and looked upon the risk factors in subjects of chronic hepatitis C, in Pakistan. Viral Hepatitis C is worldwide issue in humans and Pakistan is also affected on large scale. It is targeted by WHO (world health organization) to eliminate the HCV infection form the Globe by 2030 [17]. Early identification and elimination of risk factors is essential to control the disease prevalence and incidence worldwide.

In current study, a considerable relationship among HCV infection and risk factors were analyzed which were similar to the previous studies. Studies conducted in Iran analyzed strong association of HCV seropositivity and length and number of injection, tattooing, sharing equipment and history of imprison in subjects [18] [19] [20]. In current research risk factors were identified, repeated/ multiple injections was observed in 228 (93.8%) patients, tattoo marks in 10 (4.1%). No prisoner was registered in current study.

In Pakistan 15% were habitual IV drug abusers from 05 million addicts [21]. The addicts had used other injectable drugs so there was alteration from inhalation to injections [22]. The occurrence of HCV in IV drug abusers as reported in different studies was as high as 57% ± 17.7% [23] [24] [25] [26]. In our setup addiction rate in study was low 3.3% in comparison to other studies. Findings of present study were different from the others. HCV was reported as 48.67% ± 1.75% in subjects with blood disorders [27]-[33]. In present study 7.8% subjects had history of transfusion.

Needle pricking during recapping the syringes accounts for 2% - 10% trans-

mission of HCV especially in health care workers [34] [35] [36]. No health care worker was registered in current research.

Illiteracy, lack of health education, decreased sex knowledge is the most important difficulties in our population. In 20% of naive USA, infection with HCV reported to be related with sexual involvement [37]. The demography of present study shown that 73 subjects were uneducated and on contrary the educated was 170 but majority of them were below matriculation. Low education may be the contributing factor to transmission of HCV.

Studies had shown decreased incidence of HCV infection in sex workers (commercial) [38] [39]. Constant uses of condoms were observed in sex workers (women 17% and men 3%) and 4% in Hijras (transgender). In street children activities like homosexuality were very common and with passage of time these activities assumed into commercial sex and condom use in (homosexuals) were very lacking [40]. Inter spousal incidence of HCV was reported as 17.24% ± 7.98% in different studies [41] [42] [43] [44]. No permission for commercial sex in Pakistan. But homosexuality and heterosexuality both are common hidden practices in our setup. In present research, we had registered very low number of sex offenders because of psychosocial and religious concern.

In Hyderabad, Sukkur and Mirpur Khas sharing of injection equipment was observed in 8.5%, 33.6% and 68.0% respectively [25] [45]. In current research there were 228 (93.8%) subjects with history of needle pricking by non-medical and medical professionals, accidently or nose and ear piercing. Needle pricking ratio was very high and strong risk predictor for HCV infection in local setup.

In Pakistan round about 1.2 - 1.5 million transfusions are given each year as reported by W.H.O [46] Study conducted by Luby *et al.* analyzed that 23% blood banks routinely screen for HCV, and 25% of Blood Banks didn't fulfill WHO criterion for storing the collected blood. About 66% of Pakistani populace belongs to the rural community where blood transfusion facilities are insufficient. Professional donors should be discouraged to promote the hazardous free blood supply [47]. In our setup many of rural health centers lacks the proper equipments and screening facilities even in Talka hospitals and District hospitals the screening methods are very poor and matter of concern.

Barbers in Pakistan and other developing nations are mostly illiterate and had no knowledge of health related infectious mediators which they spread through reuse of unsterilized razors and scissors [48]. Approximately 13% of barbers were aware that hepatitis could be transmitted by contaminated razors/scissors etc [49]. Studies had analyzed that most of the barbers were not knowing about HCV infection and performing shavings in contaminated conditions [50]. Viral hepatitis C was present in 70.0% of facial and 48.0% of axillary shavings by barbers [51]. In current study, 121 (73.33%) male subjects had history of barber shavings most of them were with low educational level and were unaware of HCV transmission from the barber's shavings (face and armpit).

Circumcision is a religious practice, earlier this was done by the commercial barbers by unsterilized equipments [50]. Major and minor surgical procedures

were also analyzed in current study except circumcision. History of surgery in 08 males and 25 female subjects, dental procedure in 24 males and 07 females and history of safe delivery was present in 25 females.

It is recommended that there should be a national screening plan for hepatitis C. All subjects who are at risk in population must be investigated earlier. Steps should be taken to control risk factors. Screening program at national level should be started in early childhood to all ages.

Early diagnosis and prompt treatment at standard levels (recommended by WHO/FDA and other international agencies) should be applied at large scale. Medical surgical and dental instruments should be checked at international standards to avoid contamination. Sterilization levels should be improved at protocol levels. Health education may play vital role in control of different preventable risk factors. It is responsibility of government and public sector that they should be aware and have an eagle eye on this current issue of morbidity and mortality.

5. Conclusion

HCV there is a big financial burden on public and government, most of our population belongs to lower economic class and cannot afford the treatment and management of hepatitis C alone or with its complications. Needle pricking, barber shaving, blood and its products and dental procedures are common risk factors in our research. While IV addictions, heterosexuals, homosexuals, unsafe delivery methods, dialysis, tattoo markings and vertical transmission from mothers to off springs were identified main contributing risk factors of present study. It is concluded that proper implementation of precautionary measurements should be carried out for every one human being to reduce contact of HCV illness in far near future.

6. Recommendations

A large study for the screening of HCV should be carried out at national level to check the exact possible prevalence of HCV infection in Pakistan. All age groups and genders should be involved. At national level total prevalent risk factors should be identified and all should be assessed for modifications. Valid steps should be taken to control the risk factors. All governmental and nongovernmental organizations at national and international levels should be involved to control various risk factors. Health education at national levels should be implanted

Monitoring agencies should work at ground root levels to control the situation

7. Limitations

This was a small size study in our local setup.
Only those subjects were included who came after diagnosis for treatment.

The status of community exposed / unexposed was unknown.

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Conflict of Interest

Author declares that he has no conflict of interest.

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