Evaluation of Risk Factors of HCV infection in Lahore, (Pakistan)

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Abstract

Hepatitis C Virus (HCV) infection is rapidly growing disease in world in general and in Pakistan in particular. In Pakistan more than 10 million persons have HCV +ve signs. Risk factors for this fatal disease included main, historic and demographic factors. Some researchers segregated few independent factors but other, include them in the category of depends. We have collected the data for Lahore (Pakistan) and analyzed this data by considering the aforesaid factors. Some results of this research do not match with the existing theories. We recommended that interaction effects of associated factors should also be considered in evaluation.

Keywords: chi-square, correlation, adjusted odds ratio.

1. Introduction

Human beings are at risk due to infinite number of diseases some of which have been diagnosed by researchers and remainders are, still an alarming siren for them. Some diseases have definite source for their occurrence, some have been diagnosed to possess possible causes but a large number of diseases with respect to their causes, in medical science, are still unidentified, Hepatitis C Virus (HCV) infection is one of them. Spread of Hepatitis C Virus (HCV) requires blood-to-blood contact. The two most common ways that hepatitis C is spread, in Pakistan, are by injection and blood transfusion. Hepatitis C absolutely cannot be spread by casual contact. It can potentially be spread within families, by sharing razors, toothbrush, nail cutter etc or on barber's shops. HCV is not easily transmitted through sex because the hepatitis C virus is not found in semen or cervical secretions.

HCV is the major cause of non-A, non-B hepatitis, worldwide that was discovered in 1989 and serological tests for blood screening were developed soon after, (Choo QL, Kuo G, Weiner AJ et al. 1989) and (Kuo G, Choo QL, Alter et al. 1989) have given the detailed study about it. According to (Alter, M.J., et al. 1992 HCV has been the leading cause of chronic viral hepatitis in the United States and about 3.9 million population in that country were infected. Due to its capacity to mutate, no vaccination at the moment can be developed and presence of antibodies against it in body does not confer any resistance against this virus in a concrete way. (Seyed Moayed Alavian et al 2002) discusses that the treatment of hepatitis C remains a very demanding and yet not quite promising task and this

fact adds to the importance of prevention of this disease. Controlling the risk factors is one of the best measures of prevention and this has caused the medical world to search for risk factors of this disease through different studies. According to (Stephen A. villano, et al 1997), existing therapies are successful in less than one-third of cases, and no HCV vaccine is available, efforts to reduce HCV transmission are crucial to reduce the impact of this disease. However, Cirrhosis, Internal bleeding, Altered conscious level, Fluid retention, and Liver cancer. are the complications due to Hepatitis C. Di Bisceglie, et al (1991), Kiysowa, K., (1990), Terrault, N.A. & T.L. Wright. (1995) and Tong, M.J. (1995) studied the Chronic HCV infection, and found that it is strongly associated with cirrhosis, liver cancer, and end stage diseases requiring transplantation,

According to Seyed Moayed et al (2002) numerous possible risk factors have been evaluated, some of which have been identified, as independent risk factors of HCV infection, like blood transfusion, endoscopies, sexual activities etc. But our analysis for this purpose shows that these factors are significant but not independent, results are shown in the discussion below.

The focus of our study is the risk factors for HCV infection in Pakistan in general and in Lahore in particular. We collected the data with the kind cooperation of gesterntrologists and analyzed it with the help of SPSS, Statistical software. The results of our analysis are given in the following table-1.

2. Methodology

In this research we present a study, which is a part of Meta analysis being conducted in teaching hospitals through out the Punjab (Pakistan). Our study consists an Initial analysis on 330 patients (135 cases & 195 controls), the data was collected from the major hospitals at Lahore. We have used the odds ratios and chi-square statistics for the analysis.

Table-1

Risk Factors	Odds Ratio	95% C-I for Odds Ratio		Chi-Square	P-Value	Risk Factors	Odds Ratio	95% C-I for Odds Ratio		Chi-Square	P-Value
		LCL	UCL					LCL	UCL		
Blood Transfusion	3.133	1.375	7.13	4.804	.028	Fever History	3.118	1.231	7.900	27.546	.000
Injection History	2.175	.726	6.511	17.012	.000	Pruritis History	2.466	.930	6.539	18.926	.000
Barber Shave	3.314	.846	12.977	2.68	.102	Malina History	1.061	.385	2.924	10.469	.001
Piercing	1.721	.195	15.211	.668	.407	Encaplopathy History	1.239	.470	3.269	11.879	.001
Needle Pick	.558	.226	1.378	.121	.728	Haematenesis History	.823	.271	2.500	5.692	.017
Dental Surgery	.846	.372	1.926	3.725	.054	Age	1.035	1.003	1.068	14.913	.005
Family History	.763	.275	2.118	2.676	.102	Gender	1.062	.115	9.813	.255	.614
Surgery	.673	.295	1.537	5.302	.021	Marital status	.139	.024	.788	1.277	.258
Endoscopy	1.765	.333	9.340	3.308	.086	Height	.996	.901	1.101	1.943	.584
Heterosexual	.853	.109	6.664	.358	.55	Weight	.999	.969	1.030	5.886	.117
Jaundice History	1.291	.505	3.301	5.875	.16	Location	2.327	.993	5.449	6.429	.011

3. Discussion

Injection history is highly significant factor with smallest P-value (0.000) means that spread of disease through the non-disposable syringe is very common. Blood transfusion and surgery are highly significant factors because their P-value is very small i.e. less than 3% it means that blood transfusion and surgery play a highly significant role in spread of HCV infection. Dental procedure is a significant factor with P-value less than 6% and endoscopies are significant with P-value less than 9% means that dental surgery and endoscopies play a significant role in spread of HCV infection. Barber shave and family history are factors having same P-value 10.2%, we can not ignore the significance of these factors towards killing disease. All the history variables, fever history, pruritis, malena, enceplopathy and haematenesis except history of jaundice are highly significant with very small P-value means that a patient with HCV infection must have a fever frequently, itching on body, black stool, and blood vomiting. A patient of this disease also has jaundice because P-value is not very large. Age is significant with very small P-value that means that people of old age are at high risk. Gender is not significant that means male and female are almost equally at risk of this disease. Location is highly significant factor that means people living in rural area are at more risk of this disease than people living in urban areas. Martial status, height and weight are not significant factors.

However, we have arranged the main risk factors including historical and demographic factors by the order of their intensity of significance and the results are shown in the following table-2.

Table-2

Risk Factors	Odd Ratios	95% C.I for odd Ratios LCL	UCL	CHIS	P-VALUE
Injection History	2.175	0.726	6.511	17.012	0.000
Fever History	3.118	1.231	7.900	27.546	0.000
Pruritis History	2.466	0.93	6.539	18.926	0.000
Malena History	1.061	0.385	2.924	10.469	0.001
Encephlopathy	1.239	0.47	3.269	11.879	0.001
Age	1.035	1.003	1.068	14.913	0.005
Location	2.327	0.993	5.449	6.429	0.011
Haematenesis	0.823	0.271	2.500	5.692	0.017
Surgery	0.673	0.295	1.537	5.302	0.021
Blood Transfusion	3.133	1.375	7.134	4.804	0.028
Dental surgery	0.846	0.372	1.926	3.725	0.054
Endoscopy	1.765	0.333	9.340	3.308	0.086
Barber Shave	3.314	0.846	12.977	2.68	0.102
Family History	0.763	0.275	2.118	2.676	0.102
Weight	0.999	0.969	1.030	5.886	0.117
Jaundice History	1.291	0.505	3.301	5.875	0.160
Marital Status	0.139	0.024	0.788	1.277	0.258
Piercing	1.721	.195	15.211	0.668	0.407
Hetero Sexual	0.853	0.109	6.664	0.358	0.550
Height	0.996	0.901	1.101	1.943	0.584
Gender	1.062	0.115	9.813	0.255	0.614
Needle Prick	0.558	0.226	1.378	0.121	0.728

Injection, Fever and Pruritis are the most significant factors. Malena, Encephlopathy, age, Location, Haematenesis, surgery and blood transfusion are the next most significant factors by the order of their significance, which are playing a vital role in the spread of HCV infection in Lahore in particular and in Pakistan in general.

4. Correlations

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

	Age of patient	gender of patient	marital status	height of patient in inches	weight of patient in kgs.	location	jaundice	fever	pruitis	malena	Encephalopathy	Haematenesis	blood transfusion	injection	barber shave	piercing	Needle prick	dental procedures	family history	surgery history	Embrogy	Hetero-sexual
Age	1	.066	-.500(**)	-.014	.244(**)	-.220(**)	-.155(**)	-.230(**)	-.260(**)	-.239(**)	-.210(**)	-.267(**)	.138	-.300(**)	-.129	-.079	-.088	-.259(**)	-.105	-.200(**)	-.188(**)	-.022
gender	.066	1	-.224(**)	-.089(**)	-.072	-.094	-.065	-.197(**)	-.267(**)	-.082	-.245(**)	-.153(**)	-.118	-.075	-.259(**)	-.318(**)	-.092	-.144(**)	-.049	-.040	-.180(**)	.254(**)
marital status	-.500(**)	-.224(**)	1	.133	-.119	.172(**)	.118	.241(**)	.267(**)	.228(**)	.201(**)	.163(**)	-.027	.223(**)	.049	.330(**)	.095	.265(**)	.113	-.131	.126	.094
height of patient in inches	-.014	-.089(**)	.133	1	.172(**)	.148(**)	-.052	.188(**)	.133	.089	.157(**)	.163(**)	.044	-.488(**)	.049	.330(**)	.060	.087	.096	.028	.069	-.163(**)
weight of patient in kgs.	.244(**)	-.072	-.119	.172(**)	1	-.091	-.088	.100	-.088	-.113	-.098	-.108	.023	-.064	-.069	-.080	-.056	-.080	-.045	-.028	-.119	.000
location	-.220(**)	-.094	.172(**)	.148(**)	-.091	1	.106	.128	.153(**)	.089	.049	.106	-.023	-.088	-.083	-.162(**)	-.095	-.169(**)	-.088	-.033	-.127(**)	.025
jaundice	-.155(**)	-.065	.118	-.052	-.088	.106	1	.263(**)	.209(**)	.288(**)	.328(**)	.330(**)	.041	.121	.033	.078	.095	.214(**)	-.088	-.033	.222(**)	.154(**)
fever	-.230(**)	-.197(**)	-.241(**)	-.188(**)	.100	.128	.263(**)	1	.410(**)	.345(**)	.410(**)	.346(**)	.016	.334(**)	.007	.200(**)	.144(**)	.153(**)	.070	-.019	.070	.051
pruitis	-.260(**)	-.267(**)	-.228(**)	-.133	-.088	.153(**)	.209(**)	.410(**)	1	.330(**)	.345(**)	.338(**)	.122	.311(**)	.004	.229(**)	.029	.323(**)	.111	-.102	.185(**)	.120
malena	-.239(**)	-.082	-.228(**)	-.089	-.113	.182(**)	.288(**)	.345(**)	.330(**)	1	.239(**)	.529(**)	.002	.248(**)	.089	.112	.155(**)	.271(**)	.071	-.144(**)	.257(**)	.167(**)
Encephalopathy	-.210(**)	-.245(**)	-.201(**)	-.157(**)	-.098	.049	.328(**)	.410(**)	.345(**)	.239(**)	1	.238(**)	.082	.241(**)	-.077	.181(**)	.215(**)	.159(**)	.090	-.094	.185(**)	.066
Haematenesis	-.267(**)	-.153(**)	-.163(**)	-.163(**)	-.108	.106	.330(**)	.232(**)	.529(**)	.529(**)	.238(**)	1	.095	.191(**)	-.029	.147(**)	.139	.222(**)	.084	-.153(**)	.334(**)	.087
blood transfusion	.138	.118	-.027	.044	.023	-.023	.041	.016	.122	.002	.082	.095	1	-.005	-.036	.077	.036	.066	.041	.185(**)	.153(**)	.092
injection	-.300(**)	-.075	.272(**)	.133	.063	.106	1	.334(**)	.311(**)	.248(**)	.241(**)	.161(**)	-.036	1	.104	.106	.032	.159(**)	.127(**)	-.166(**)	.116	.064
barber shave	-.129	.750(**)	.049	-.488(**)	-.064	.033	.121	.007	-.094	.089	-.077	-.029	-.036	.104	1	-.692(**)	-.088	-.101	.026	-.104(**)	-.096	-.251(**)
piercing	-.079	-.503(**)	.310(**)	.533(**)	.069	.162(**)	.078	.200(**)	.229(**)	.112	.181(**)	.147(**)	.077	.096	-.692(**)	1	.048	.153(**)	.083	-.030	.045	-.153(**)
Needle prick	-.088	-.092	.095	.069	-.056	.163(**)	.095	.144(**)	.029	.155(**)	.215(**)	.139	.093	.092	-.088	.048	1	.170(**)	.093	-.043	.126	.129
dental procedures	-.259(**)	-.144(**)	.265(**)	.087	-.080	.166(**)	.214(**)	.153(**)	.323(**)	.271(**)	.159(**)	.222(**)	.095	.169(**)	-.101	.153(**)	.170(**)	1	.114	-.086	.254(**)	.115
family history	.105	.049	.265(**)	.087	-.080	.166(**)	.214(**)	.153(**)	.323(**)	.271(**)	.159(**)	.222(**)	.095	.169(**)	-.101	.153(**)	.170(**)	1	.114	-.086	.254(**)	.115
surgery history	.200(**)	.040	.131	.028	-.078	-.033	.108	-.192(**)	.102	.144(**)	.094	.153(**)	.185(**)	.166(**)	-.104(**)	.030	.043	.086	-.035	1	.031	.044
Embrogy	.188(**)	.081	.126	.069	-.119	.172(**)	.222(**)	.070	.185(**)	.257(**)	.126	.334(**)	.153(**)	.116	.096	.045	.126	.254(**)	.081	.031	1	.001
Hetero-sexual	.022	.254(**)	.094	.167(**)	.000	.025	.154(**)	.051	.120	.167(**)	.066	.087	.092	.064	.258(**)	.153(**)	.129	.115	.054	.044	.001	1

Risk factor Blood Transfusion is correlated with the risk factors Surgery and Endoscopies this means that Surgery and Endoscopies are the main causes of blood transfusion, History of injection is correlated with Dental Procedure, Family History and surgery, and here again surgery is correlated with risk factor named injection. Also in the same comparison we see that injection factor and Barber Shave are correlated with Surgery and Heterosexual, Piercing is correlated with Dental Procedure and injection, Needle Prick is correlated with Dental Procedure and Dental Procedure is correlated with Endoscopies. Main risk factors considered in this paper are all correlated and no independent risk factor is detected. It means their interaction effect may play a significant role in spread of disease.

Jaundice, Fever, Pruritis, Malena, Enceplopathy and Haematenesis are historical factors they are highly correlated with each other means that these are almost present in HCV patients.

When we go through the correlation analysis we found that some correlations are significant, this indicates that interaction effects should also be considered for further analysis, which is under process at the moment.

5. Acknowledgement

We are grateful to Dr. Nahid Hamayanue Sheikh, head of department Community medicine, Allama Iqbal Medical College, Lahore (Pakistan) for valuable suggestions while designing the questionnaire.

We are also thankful to Dr. Abdur Rehman, Deputy M.S research, Mayo Hospital, Lahore (Pakistan).

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