ASSESSMENT OF RISK FACTORS FOR HEPATITIS C IN REPRODUCTIVE LIFE OF WOMEN: A TERTIARY CARE HOSPITAL BASED STUDY FROM QUETTA, BALOCHISTAN – PAKISTAN

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ABSTRACT

Background and Objectives: To assess the risk factors for hepatitis C in reproductive life of women at tertiary care hospitals at Quetta Pakistan.

Methodology: A case control study has been conducted at two tertiary care hospitals of Quetta in 2014. Total 316 (158 in each cases and control) women were included in the study. The written consent was taken from the women with reproductive age from 15 – 49 years of age. Respondents from both cases and control suffering from HBV infection, co-infection and dual infection with HCV and HBV were excluded from the study. Data was coded, entered and analyzed by using SPSS. To asses bivariate associations between HCV sero-positivity and potential risk factors like socio-demographic characters, past medical history and factors related to obstetrical history, odds ratio (OR) and their 95% confidence intervals (CIs) were computed by logistic regression.

Results: The thirteen variables logistic regression model shown the injections in the past year (OR 1.96, CI 1.22 – 3.15), injections last 5 years (OR 1.61, CI 1.14 – 2.28), injections at unregistered place (OR 3.81, CI 1.98 – 7.34), subjects lived with jaundice in house hold (OR 2.50, CI 1.39 – 4.47), personal jaundice (OR 1.90, CI 1.05 – 3.42) were positively associated with being HCV – positive. While family income (OR 0.59, CI 0.39 – 0.87), history of previous surgeries (OR 0.37 CI 0.19 – 0.72) was associated negatively.

Conclusions: Study concluded that irrational use of injections by non-trained health professionals, family income and women who had contact or living with jaundice patients were found highly significant factors for developing the hepatitis C infection. Thus, reducing the overuse of unnecessary injections would be a major step towards reducing transmission of HCV among women.

Keywords: Hepatitis C, risk factors, reproductive life, women, childbearing age, hospital, case control, tertiary care and infection.

INTRODUCTION

It is estimated that approximately 130 – 150 million people worldwide are currently infected with hepatitis C virus (HCV), according to data from world health organization (WHO) community and blood donor surveys, the African and Eastern Mediterranean countries report the highest prevalence rates (> 10%)[1]. The rates of infection in the general population and increasing incidence indicates considerable change in the epidemiology of the infection in recent years.[2] Intermediate rates of HCV have been reported from Asia.[3] To estimate the prevalence in Pakistan few population – based studies are available, a community based study from Hafizabad found around 6% positive cases among the general masses. The prevalence has increased to 30% as age goes up. However, it was found in similar studies that around 16% and 24% house hold members are shown to be HCV infected from Lahore and Gujranwala[4,5] respectively. The prevalence of HCV in children under the age of 12 and between 12 – 19 years is estimated from 0.2% and 0.4% respectively.[6] Women are expected to be the major victims of HCV infection because of greater exposure to syringes, blood and blood products, especially during pregnancy, delivery, ear and nose piercing.[7] In Balochistan province where females have low literacy rate and less awareness as compared to other provinces of Pakistan may make situation worse. Identifying risk factors for HCV among women in the reproductive age will help in promoting the health by preventing these risks. Aim of the study was to identify risk factors associated for hepatitis C virus infection in females during active reproductive age in Quetta, Pakistan.

METHODOLOGY

This was a case control study conducted at two tertiary care hospitals of Quetta District, Balochistan from 1st January – 30th March, 2014. These hospitals were; Bolan Medical Complex Hospital (BMCH) and Sandeman Provincial Hospital (SPH). The study population from both the case and controls were females in active reproductive age (18 to 40 years), who were screened for HCV before the study. Cases were included when Enzyme – Linked Immuno-Sorbent Assay (ELISA) antibody test positive for HCV and Controls were ELISA antibody test negative. A validated questionnaire was adapted, translated, pre-tested and used for this study.[8] Those cases and controls having HBV infection, co-infection and dual infection with HCV and HBV were excluded. A sample size of 316 (158 for each group) subjects was calculated through Epi Info software after taking the confidence level 1 – α 95% at 80% power and an odd ratio 2 and 2.4. Non-probability sampling technique was used by including the women of reproductive age group visiting OPD of both hospitals from all specialties were selected and were enrolled after taking the written consent for the study. Trained female data collectors used validated and pretested questionnaires. Variables like; self – reported history of injection / infusion for last month, one year, and five year, History of previous surgeries, house hold contact with jaundice or hepatitis, history of dental treatment, number of history of blood transfusion, history of hospitalization and ear piercing were asked. Number of gestations, parity, antenatal care visits, type of deliveries, place of deliveries, history of abortion, history of dilatation and curettage, number of injections during obstetrical history were asked by the respondent and were included in this study. Study was approved by the Bio-ethics committee of Chulalongkorn University, Bangkok, Thailand. Data was coded, entered and analyzed by using SPSS. Mean ± SD were calculated for age, duration of marriage and number of house hold members. Descriptive statistics were computed for categorical variables for cases and controls by computing their frequencies for the two groups. To asses bivariate associations between HCV sero-positivity and potential risk factors like socio-demographic characters, past medical history and factors related to obstetrical history, odds ratio (OR) and their 95% confidence intervals (CIs) were computed by logistic regression. All the risk factors with p < 0.20 on bivariate analysis were considered for inclusion in the multivariable logistic model. All risk factors with P < 0.05 were considered significant.

RESULTS

The general information about all study participants

Table 1: *Socio-demographics characteristics of Cases (HCV Group) and Controls.*

Characteristics		Number (Percentage)	
		Case	Control
Age	Range	18 – 40	18 – 40
	Mean	32.37 ± 6.68	31.71 ± 6.89
Hospital	BMCH	96 (50.0%)	96 (50.0%)
	SPH	62 (50.0%)	62 (50.0%)
Marital Status	Married*	147 (50.9%)	142 (49.1%)
	Unmarried	11 (40.7%)	16 (59.3%)
Location	Urban *	86 (54.4%)	98 (62.1%)
	Rural	72 (45.6%)	60 (37.9%)
Duration of marriage	Range	0 – 25	0 – 32
	Mean ± SD	11.17 ± 7.2	10.62 ± 7.6
Tribe	Baloch	59 (52.7%)	53 (47.3%)
	Pashtoon	55 (48.7%)	58 (51.3%)
	Others*	44 (48.4%)	47 (51.6%)
Education	No schooling	118 (51.5%)	111 (48.5%)
	Primary level	25 (47.2%)	28 (52.8%)
	Secondary level and above	15 (44.1%)	19 (55.9%)
Occupation	Housewife*	136 (51.9%)	126 (48.1%)
	Other	22 (40.7%)	32 (59.3%)
Family Income	5000 & < 5000	56 (52.8%)	50 (47.2%)
	5001 – 10000	83 (56.1%)	65 (43.9%)
	> 10000	9 (30.6%)	43 (69.4%)
No. of Household	Range	2 – 40	2 – 32
	Mean ± SD	9.66 ± 5.1	10.09 ± 4.9

Reference group

has been given in Table 1. Majority of the study subjects 60% were from Bolan Medical College Hospital (BMCH) and about 40% of the subjects were from Sandman Provincial Hospital (SPH). Mean (± SD) age for case was 32.37 (± 6.68) and for controls was 31.71 (± 6.89) years. About 46% cases were from urban areas and 38% of the controls were from rural areas. Age does not differ significantly among cases and controls (p value = > 0.384). The mean (± SD) duration of marriage for the cases was 11.17 (± 7.2) and for the control was 10.62 (± 7.6) years. A total of 52% of cases and 48% of controls never went to school. About 52% of

Table 2: *Multivariable assessment of risk factors for Hepatitis C infection: 13 – variable logistic model.*

Characteristics		Number (percentage)		OR	95%CI	p value
		Case	Control			
Location	Urban*	86 (54.4%)	98 (60%)	1	---	---
	Rural	72 (45.6%)	60 (40%)	0.92	0.51 – 1.64	0.766
Occupation	Housewife*	136 (51.9%)	126 (48.1%)	1	---	---
	Other	22 (40.7%)	32 (59.3%)	0.84	0.38 – 1.84	0.651
Family Income	< 5K	56 (52.8%)	50 (47.2%)	0.59	0.39 – 0.87	0.008
	5 – 10 K	83 (56.1%)	65 (43.9%)			
	> 10 K	19 (30.6%)	43 (69.4%)			
H/O injection in last month	No	98 (62.0%)	112 (70.9%)	1.00	0.63 – 1.59	0.994
	1 – 3	41 (25.9%)	37 (23.4%)			
	> 3	19 (12.0%)	9 (5.7%)			
H/O injection in last year	No	41 (25.9%)	86 (54.4%)	1.96	1.22 – 3.15	0.005
	2 – 5	64 (40.5%)	58 (36.7%)			
	≥ 6	53 (33.5%)	14 (8.9%)			
H/O injection in last 5 year	< 5	41 (25.9%)	82 (51.9%)	1.61	1.14 – 2.28	0.008
	5 – 10	48 (30.4%)	47 (29.7%)			
	11 – 20	39 (24.7%)	20 (12.7%)			
	> 20	30 (19.0%)	9 (5.7%)			
Injection by trained staff	No*	77 (48.7%)	106 (67.1%)	1	---	---
	Yes	81 (51.3%)	52 (32.9%)	1.62	0.92 – 2.86	0.096
Injection by untrained staff	No*	91 (57.6%)	137 (86.7%)	1	---	---
	Yes	67 (42.4%)	21 (13.3%)	3.81	1.98 – 7.34	<0.001
History of previous surgeries	No*	120 (75.9%)	109 (69.0%)	1	---	---
	Yes	38 (24.1%)	49 (31.0%)	0.37	0.19 – 0.72	0.004
Lived with Jaundice patient	Never*	84 (53.2%)	125 (79.1%)	1	---	---
	Ever	74 (46.8%)	33 (20.9%)	2.50	1.39 – 4.47	0.002
H/o jaundice ever	No*	101 (63.9%)	117 (74.1%)	1	---	---
	Yes	57 (36.1%)	41 (25.9%)	1.90	1.05 – 3.42	0.035
Delivery at hospital	No*	66 (41.8%)	80 (50.6%)	1	---	---
	Yes	92 (58.2%)	78 (49.4%)	1.85	1.05 – 3.25	0.032
Delivery at home	No*	64 (40.5%)	78 (49.4%)	1	---	---
	Yes	94 (59.5%)	80 (50.6%)	0.74	0.41 – 1.34	0.327

*Reference group

cases were housewives and 48% were housewives among controls. The mean number of households was 9.66 (± 5.1) for cases and 10.09 (± 4.9) for controls. Regarding social division 35% were belonging from Baloch tribe both in cases and controls, and 36% were Pashtoons in cases and controls, while remaining 29% were from other ethnic groups. More than half of the study subjects had a monthly income of between PKR 5000 to 10000 (50 to 100 US$).

Table 2 shows the multivariable logistic regression model risk factors associated with Hepatitis C virus infection where thirteen variables for which p < 0.20 were included in the multivariable logistic model. Use of injections in the last year was statistically significant in causing HCV infection (OR 1.96, CI 1.22 to 3.15, p = 0.005), injections last 5 years (OR 1.61, CI 1.14 to 2.28p = 0.008), injections use at unregistered place with untrained health staff was found statistically significant in getting HCV infection among women of reproductive age group (OR 3.81, CI 1.98 – 7.34 p < 0.001), subjects lived with jaundice in house hold was also found statistically significant (OR 2.50, CI 1.39 – 4.47, 0.002), personal jaundice (OR 1.90, CI 1.05 – 3.42, p = 0.035) were positively associated with being HCV – positive. While family income (OR 0.59, CI 0.39 – 0.87 p = 0.008), history of previous surgeries were also found statistically significant in development of HCV disease (OR 0.37 CI 0.19 – 0.72 P = 0.004) was associated negatively.

DISCUSSION

This study explored the associations of HCV positivity with the family income, injections last year, injections in the last 5 years, injections at unregistered place / practitioner, subjects lived with jaundice in household, and personal jaundice, while history of previous surgeries was negatively associated among women seeking treatment in hospitals of Quetta. Studies conducted among male population in Pakistan showed association of injections[9-11] and elsewhere, such as Taiwan[12,13] China[14] and Egypt.[15] Injections are most rapid mode of transmission if needles are contaminated with the pathogens and studies in Pakistan have reported that injection overuse is very common in Pakistan.[16] Majority of paramedics are not trained accordingly and are unaware of standard sterilization procedures or the importance of safe injection practices in Pakistan.[17] Due to lack of education most of the population of Pakistan is uninformed about risks associated with injections and have strong believe that injections are most efficient way to take drugs during illness and large proportion of population use` parental route to take drugs.[18,19] In this study the history of injections showed a significant association during last one and five years. The findings of this study were consistent with other studies conducted in Pakistan; which concluded an odds ratio of 2.4 for one or more injections because of

child bearing; women are at higher risk of receiving injections resulting in more risk of getting infection.

Results of this study revealed no significant association between major or minor surgical interventions and HCV infection. However previous studies conducted among general population revealed former surgeries had a significant positive association with HCV infection.[20-21] The reason for this negative association might be that these hospitals have universal screening programs and patients are screened for diseases like hepatitis and AIDS prior to surgeries and infected patients are treated separately from other patients, and more over the infection may be associated with post surgical consequences like more frequent use of injections at their homes or unregistered places when the patients are discharged from the hospitals. A study conducted in Pakistan among pregnant women also showed no association with gynecological procedure.[22] Moreover, women during their reproductive life are more likely to receive medication and minor surgeries during labor in form of injections.

Delivery in hospital was associated with significantly increased risk of hepatitis C infections. Studies demonstrate the results of improper infection control due to lack of training or not following the proper precautions at health centers. Living with a person infected with HCV at household showed significant association among cases as compared to controls. Another study conducted elsewhere showed same associations with possible reason getting contact with contaminated blood or saliva, needles or sharing of things like razor and tooth brushes.[23] A study in Pakistan revealed significant association of toothbrushes with HCV positive patients.[24] Studies have reported that the chronic infected patient's saliva detected RNA for HCV as well[25].

Study **concluded** that some kinds of iatrogenic exposure, number and use of injections by untrained staff, Income, hospitalizations for deliveries and household contact with a person having jaundice were strong risk factors for spreading HCV among women in reproductive age in patients visiting BMCH and SPH Quetta, Pakistan.

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