Vol. 15, No. 3
ORIGINAL PAPER

GYNAECOLOGY & OBSTETRICS

MEDICAL CHANNEL
JULY - SEPTEMBER 2009

FREQUENCY OF SEROPOSITIVITY OF HEPATITIS C VIRUS AND RISK BEHAVIOUR IN PREGNANT WOMEN

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ABSTRACT

OBJECTIVE : *The objective of this study was to determine the prevalence of Hepatitis C virus infection in pregnant women and to detect the risk factors for its acquisition.*
PATIENTS AND METHODS : *This was a prospective case control study carried out over a period of one year in antenatal clinic of Sindh Govt. Lyari General Hospital, Karachi. During this period 1260 pregnant patients were screened for HCV antibodies by ELISA. Age, parity and gestational age of both hepatitis C positive and hepatitis C negative women were noted. History of blood transfusion, jaundice, multiple injections, sexual contact, drug abuse and nose prick were taken to detect their association with the disease in both negative and positive groups. All the results were analyzed on SPSS 15 and independent-t test, chi-square test and logistic regression were utilized where they are required. Significance was evaluated at P – value < 0.05.*
RESULTS : *The prevalence of HCV antibody positivity was found in 3.4% in study group. Mean age, parity and gestational age were comparable in both groups. History of blood transfusion was present 34.9% of seropositive group as compared to 7% in seronegative group (P-value 0.00). Logistic regression analysis also depicted strong association between blood transfusion and seropositivity (CI 0.315-0.025). History of multiple injections and seropositivity also has strong association (CI 0.062 – 0.489) while the history of jaundice and nose prick were found as significant factor but their strength decreased on logistic regression.*
CONCLUSION : *This study revealed seropositivity of HCV of 3.4%. Blood transfusion, multiple injection, history of jaundice and nose prick were found to be significant risk factors. Public education regarding proper screening of blood, avoidance of injudicious use of injection and prevention of using shared instrument for nose prick can reduce the prevalence of this deadly disease.*

KEY WORDS: Pregnancy, hepatitis C, risk factors.

INTRODUCTION

Hepatitis c virus is a major health care concern worldwide, but more so in developing countries like Pakistan[1]. According to WHO report 170 million persons are chronically infected by this virus worldwide (approximately 3% of world population) with a varied prevalence of infection ranging from 1% of the population of Europe to 5.3% of the population of Africa[2].The highest number reported from Egypt while in USA it is 1.8%[3]. The prevalence of HCV-RNA positivity in pregnant women ranges from 1.25% to 4.5% in different countries[4]. Seropositive patient poses major threat of developing cirrhosis and hepatocellular carcinoma carrying high morbidity and mortality.

The prevalence of HCV can be predicted by risk factors associated with transmission of infection. The factors most strongly associated with infection are receipt of blood transfusion, injection-drug use, occupational injury, sexual transmission, patients undergoing dialysis and vertical transmission while in some cases no risk factors can be elucidated[5]. It has been estimated that there is an approximately 5% risk of vertical transmission to the new born but it becomes very high in presence of high viral load and co-infection with HIV[6] .

Seroprevalence of hepatitis in Pakistan is still unclear and its epidemiology particularly in pregnant women has yet to be established. One local study revealed seropositivity in pregnant women is close to the rate in general population in Pakistan with most frequent risk factor being history of blood transfusion[6]. The aim of this study was to determine the prevalence of hepatitis C virus infection in pregnant women attending antenatal

clinic and to find out the risk factors for acquisition of hepatitis C virus infection.

PATIENTS AND METHODS

The Study was conducted in antenatal clinic of outpatients department from 1st June 2007 to 31st May 2008 in Sindh Govt. Lyari General Hospital, Karachi which is a tertiary care teaching hospital. This was a prospective case control study. During this period all antenatal patients were screened for HCV antibodies on booking visit. A total of 1260 pregnant women were tested. The test was performed by Kit second generation ELISA. All those who were found positive were evaluated for evidence of chronic liver disease by liver function tests (ALT), prothrombin time, APTT and detailed ultrasound abdomen. They were tested for RNA detection by polymerase chain reaction (PCR) technique for presence of active disease and referred to medical department for further management. PCR was performed by amplicor ver. 2 (Roche diagnostic) based Switzerland. Detailed history was taken for evaluation of risk factors like history of blood transfusion, jaundice, multiple injections, sexual contact, nose prick and spouse history of similar disease in both groups. In order to study the association of the various risk factors on HCV status of the mother, for each 43 women who were found HCV positive, 2 age matched controls were selected randomly from those found to be HCV negative. The risk factors assessed in HCV negative cases were the same as in HCV positive cases. All results were analized on SPSS 15. Standard statistical tests were used. In order to assess the association of quantitative variables (age, parity, gestational age) among cases and controls independent –T test was used and the significant P-value was taken as 0.05.

The frequency of association of the independent risk factors between hepatitis C positive and negative group were calculated by chi square test as all of them were categorical variables. Fischer's exact test was used in cases where the cell value in any table was below five. Logistic regression analysis was used to measure the strength of association with regard to various risk factors under study, among cases and controls. Adjusted odds ratios along 95% confidence intervals were calculated.

RESULTS

The proportion of HCV positive women in our study was found to be 3.41%. Mean age of HCV positive women was 27.63 ± 4.51 and mean parity 2.74 ± 1.9 which is statistically comparable to control cases. The mean gestational age was 30.7 ± 5.27 as compared to 31.3 ± 4.55 in control group with P-value being significant (Table-I). This shows that these two groups were indifferent in regards to age, parity and gestational age at the time of screening.

In the study group history of blood transfusion was present in 34.9%, history of multiple injection in 79.1%cases, jaundice in 32.27%, sexual contact in 2.3% and nose prick in 62.8% of cases. Among all these except sexual contact all the other risk factors were found to be significantly ($P < 0.001$) associated with hepatitis C positivity (Table-II).

Logistic regression was used to control the effects of various risk factors under study and to see the direct effect of single risk factor on HCV positive status (Table-III). The results of this depicted strong association

TABLE – I

Demographic features of hepatitis C positive and negative groups

	Mean ± SD	P – Value
Age		
HCV positive	27.63±4.51	0.47
HCV negative	27.02±4.54	
Parity		
HCV positive	2.74±1.90	0.07
HCV negative	2.00±2.34	
Gest age		
HCV positive	30.7±5.21	0.51
HCV negative	31.3±4.55	

Independent – t test

TABLE - II

Associated risk factors in Hepatitis C positive and negative groups

Risk factors	Hep C Positive No.	(%)	Hep C Negative No.	(%)	P-Value
Blood transfusion					
Yes	6	(7)	15	(34.9)	0.000
No	80	(93)	28	(65.1)	
History of Injections					
Yes	34	(39.5)	34	(79.1)	0.000
No	52	(60.5)	9	(20.9)	
History of Jaundice					
Yes	10	(11.6)	16	(37.27)	0.001
No	76	(88.4)	27	(62.8)	
Sexual contact					
Yes	0	(0)	1	(2.3)	0.156
No	86	(100)	42	(97.7)	
Nose prick					
Yes	78	(90.7)	27	(62.8)	0.000
No	8	(9.3)	16	(37.2)	

TABLE – III

Logistic regression (Forward Stepwise) analysis of risk factors

Risk factors	P-Value	Odds ratio	95% CI	
			Upper	Lower
Blood transfusion	0.000	0.089	0.315	0.025
Injections	0.001	0.174	0.489	0.062
Jaundice	0.022	0.273	0.829	0.090
Nose prick	0.025	3.443	10.402	1.139

between hepatitis C positivity and history of blood transfusion (95% CI 0.315-0.025) and multiple injection (95% CI 0.062-0.489). While the significance of association of nose prick and history of jaundice decreased but P-value still remained below 0.05.

DISCUSSION

Prevalence of hepatitis C antibodies among 1260 pregnant patients was found to be 3.4% which is comparable to a study from Islamabad showing 4.8% [6]. A number of studies have been published regarding prevalence of HCV in Pakistan which shown a range from o.7% to 20%[1,7]. Most of these studies are hospital based and community based epidemiological work is lacking. HCV positivity in urban metropolis of Lahore is found to be 60% which is higher than our study while seroprevalence of 2% was detected in Uganda and 4.9% in Rawanda[8,9]. Such variation in prevalence is found because of areas of high levels socioeconomic deprivation and also cases were not selected according to the presence of absence of known risk factors for HCV acquisition. Therefore these results can not be extrapolated for general population, although a study from Ethopia revealed close correlation between HCV seroprevalence in random samples and consecutively recruited pregnant women from the same community[10]. Most frequent risk factor found was blood transfusion which is in accordance with other studies[6,7,11]. Dore et al showed that route of transmission from a hepatitis C positive source is also highest after blood transfusion 83% while vertical transmission and needle stick injuries were 6.2% and 6.1% respectively and sexual contact has low rate of transmission[12].

High seroprevalence is found in multitransfused patients and therefore the number of units of blood components transfused is suspected to have strong associate[13]. It is important to consider that inspite of the systematic screening of blood donors, some patients transfused with screened blood were found positive for HCV. This demonstrated that efforts should be continued in other directions, in order to improve blood transfusion safety. New screening methods employing direct screening of pooled samples by (PCR) polymerase chain reaction assay like Nuecleic acid amplification tests (NAT) decrease the window period after infection to 3 weeks but due to its cost it is difficult to implement in third world countries[3,13].

History of multiple injection was found as a significant risk factor in our study as reported by other authors[6,7,14]. Although most of the time these injections were received from local family physicians and were given by disposable syringes, so causative factor in the transmission of HCV in such cases needs further studies in relation to contamination or sterilization of these disposable syringes and the infectious waste disposal. The people should be educated regarding the injudicious use of injection for simple reasons.

Positive past history of Jaundice was found to be significant in our study but jaundice has not been reported as associated risk factor in literature. Body piercing as nose prick was also found to be significant factor in the causation of hepatitis C which is in accordance to reports in literature[15]. Sexual contact with an individual positive for HCV which is frequently associated with contact with multiple sexual partners reported as significant transmitting factor for HCV[15]. Association with sexual transmission was very low in this study as only one patient's spouse has multiple sex partners and all women were monogamous. Therefore this is not a significant factor in our setup.

Although we have not assessed the vertical transmission in children but literature reveals 3.6% transmission in mothers with viraemia , while none of the children born to non-viraemic mother became infected[16]. There is a debate going on regarding screening of hepatitis C during pregnancy as diagnosis can result in significant psychological morbidity, stigmatization and discrimination and if it dose not effect pregnancy outcome then nothing has to be done during pregnancy. But study from Mexico showed cholestasis of pregnancy was increased in HCV antibody positive women[17]. A Swiss study concludes pregnancy may not be the right time to offer this universal screening programme[18]. But for our country with poverty, lack of facilities and poor access to hospitals this does not hold true and antenatal HCV testing provides an opportunity to identify asymptomatic women with chronic disease who may be counseled and followed up for antiviral therapy after delivery. Also preventive measures may be taken during delivery in such cases.

Hepatitis C infection is preventable and avoidable disease with serious implications as up to 20% chronically infected individuals develop cirrhosis of liver and hepatocellular carcinoma. It is recommended that routine prenatal screening for hepatitis C should be carried out in all pregnant women and proper sterilization of instruments at all levels of health care should be ensured. Large community based surveys regarding epidemiology, awareness and prevention should be carried out.

CONCLUSION

Prevalence of hepatitis C in pregnant women was 3.4% and the past history of blood transfusion and I/V injections were found to be the most important risk factors for transmission of infections. I/V drug abuse and sexual contact were insignificant and past history of jaundice and nose prick were also associated with transmission. Proper screening of blood should be ensured (taking into account of window period) and injudicious use of injectables should be discouraged to reduce transmission. As vaccine against it is not yet available and antiviral therapy is very expensive and most of the people can not afford it, hence prevention is the only way to limit its spread and this can be achieved by increasing awareness among the general public by health education.

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