Original Article

HCV exposure in spouses of the index cases

Huma Qureshi, Ambreen Arif, Waquaruddin Ahmed, S. Ejaz Alam
Pakistan Medical Research Council , Research Centre, Jinnah Postgraduate Medical Centre, Karachi.

Abstract

Objective: To study the exposure of HCV in the spouses of patients suffering from chronic hepatitis C virus infection attending the outpatients department of medical research center running a liver clinic.

Methods: Index patients were defined as patients suffering from hepatitis C related chronic liver disease. HCV infection was confirmed by a 3rd generation kit, chronic liver disease by raised alanine amino transferase for over 6 months. PCR was done in a selected group who could afford the test. Serum albumin, endoscopic confirmation of varices and ultrasonography were done to evaluate any evidence of decompensation. Spouses were checked for anti HCV and ALT, those found positive were considered as exposed. Those with negative HCV were defined as not exposed.

Results: A total of 153 index cases, 127 chronic liver disease compensated liver disease and 26 with cirrhosis (signs of decompensation) and their spouses entered the study, of whom 58 spouses were anti HCV positive (38%). Of 153 patients with chronic HCV infection,127 patients had raised ALT and fulfilled the criteria of chronic liver disease (CLD). One hundred and three of 127 (81%) cases were PCR positive and 69 (67%) were candidates on interferon therapy. Of 26 cirrhotics 7 were PCR positive with advanced disease. Out of 127 patients with CLD, 50 spouses were HCV positive, 21 of whom had raised ALT. Sixteen spouses (76%) were PCR positive. Spouses of 8 cirrhotic patients were found to be PCR positive.

Conclusion: An overall HCV positivity of 38% in the spouses of index cases with 42% showing raised ALT indicates a high disease transmission. With a 5% exposure of the virus in general population, reasons for this high intra-spousal transmission needs to studied further (JPMA 57:175;2007).

Introduction

Hepatitis C infection in USA is one of the commonest causes of chronic liver disease About 3.9 million Americans carry the antibody to HCV, while 2.7 million have detectable virus in the blood indicating that about 1-2% of USA population has hepatitis C.[1] Many clinical studies suggest that in Pakistan about 4-7% (56-96 million) of the population may be suffering from HCV.[2,3] Of the 6 genotypes identified, 77-79% of the Pakistani HCV infected patients have genotype 3.[4,5]

Hepatitis C is transmitted parentally, the major risk factor being unscreened blood transfusion, reuse of infected syringes, needles and surgical instruments including dental treatment and accidental needle stick injury. Other causes include I.V. drug abuse, sexual transmission. perinatal transmission, dialysis, transplant and haemophilia / thalassaemia. Uncommon risk factors include body piercing, tattooing, and sharing of house hold items. Needlestick injury in health care workers may lead to transmission but this is lower then that with hepatitis B. After needle stick injury there is no prophylactic role of gamma globulin or hepatitis B immune globulin in the prevention of HCV infection.

Sexual transmission of hepatitis C in USA is 2-3%.[6] Risk factors for sexual transmission include multiple sex partners, prostitutes, rectal intercourse and intercourse during menstruation. Studies in married couples have indicated a higher risk of spousal transmission with increasing duration of marriage. Numerous studies have shown a limited transmission of HCV between monogamous sexual partners.[7-12] The infection rate increases to almost 4-6% in multiple sexual partners.[6] An Italian study followed the spouses of HCV infected individuals for 10 years. Genotyping and sequence analysis of the NS5b region of the HCV genome coupled with phylogenetic analysis showed that corresponding partners carried different viral isolates thus excluding the possibility of intraspousal transmission of HCV.[13]

Data available on the possibility of sexual transmission of the virus from the index case to the spouse in Pakistan is scarce[2,3] therefore the present study was done to see the exposure/infection rate in the spouses and also see if both husband and wife need to be treated simultaneously to achieve a sustained response.

Patients and Methods

Patients suffering from chronic hepatitis C infection, who were either HCV-RNA positive or had more than twice raised alanine amino transferase(active hepatitis) or had decompensated liver disease (cirrhosis) were defined as index cases of hepatitis C. Spouses of all these cases were checked for anti HCV and ALT was done to see the disease activity. Those with raised ALT and positive anti HCV were considered for treatment, those with positive HCV and normal ALT were followed every six months to monitor the disease activity, while negative HCV and normal ALT were considered as unexposed individuals. PCR in spouses was done in only selected cases who could afford, and who agreed to have the test done.

Anti HCV was done with EIA, ALT with autoanalyser and PCR was done from and outside Laboratory using Amplicor version II (Roche Diagnostics, Basel, Switzerland) . HCV RNA was extracted by Promega plasmid extraction kit. Reverse transcription was done by using specific primers.

Results

A total of 153 index cases of chronic HCV were seen. There were 105 (68.6%) males and 48 (31.3%) females with a mean age of 42 ± 9.7 years (Table 1). All cases were positive for Anti HCV, 127 cases had more than twice raised ALT for a duration of six months or more(chronic liver disease) and 103 were positive for HCV RNA. Interferon plus ribavarin was given to 69 (67%) cases to treat HCV infection indicating active disease requiring treatment. Cirrhosis with decompensation was present in 26 (17%) cases and all these cases had normal ALT, though 7 were PCR positive .

Of the spouses, 48 were males, 105 females. Anti HCV was positive in 58 spouses (38%) while 21 (42%) had raised ALT indicating the presence of disease. Twenty nine (58%) spouses had positive HCV but normal enzymes. Of 21 spouses with raised ALT, 16 (76%) were PCR positive. Of 26 cirrhotics who were HCV positive, 8 spouses were also HCV positive. Seven cirrhotics were PCR positive and of these 2 spouses were PCR positive too (Table 2).

Table. 1 Patients with HCV Infection (n=153).

Gender : Male	105 (69%)
Female	48 (31.3%)
Age: Range	24 - 72 years
Mean S.D.	42 ± 9.7 years
Active disease with ALT raised	127
PCR positive	103 (81%) out of 127
On interferon	69 (45%) out of 103
Cirrhosis	26
PCR positive	7 (27%) out of 26

Table 2. Comparison of Index cases with spouses.

	Index HCV +ve (n=153)		Spouse HCV +ve (n=58)	
CLD	127	(83%)	50	(86%)
Cirrhosis	26	(17%)	8	(14%)
CLD - Raised ALT	127	(100%)	21	(42%)
PCR +ve	103	(81%)	16	(76%)
IFN	69	(67%) out of 103	11	(69%) out of 16
Cirrhosis	26	(17%)	8	(14%)
PCR +ve	7	(27%)	2	(25%)
IFN	-		2	(100%)

CLD = Chronic Liver Disease
PCR = Polymerase Chain Reaction
IFN = Interferron

Discussion

In the presented study 58 (38%) spouses were anti HCV positive, of whom 21 (42%) had raised ALT indicating the disease activity. PCR was positive in 16 of 21 spouses (76%).

HCV exposure in the general population in Pakistan is around 5%, therefore this high exposure of spouses is unlikely to be an exposure from the general population. Most studies show that transmission of the disease is more if the index case is PCR positive, may it be mother to child transmission or sexual transmission. Keeping the same scenario in mind 110 of our index cases (103 with chronic hepatitis and 7 cirrhosis) were PCR positive and of these 23 spouses were positive for the disease i.e. had a positive HCV and raised ALT. A 38% exposure and 42% disease in the spouses is very alarming and is a finding never thought of or expected in our setting. As over 75% of the cases in our population have a genotype 3 therefore there is no point in checking the genotype to confirm sexual transmission. Sequence analysis of the NS5b region of the HCV genome, coupled with the phylogenetic analysis may be helpful to clarify the source of infection as was seen in the Italian study where dental treatment and needle stick injury were found to be source of infection.[13]

Internationally to prevent sexual spread of hepatitis C it is recommended that (a) person who is involved in high risk sexual practices should adopt safety measures, (b) partner should be advised that the risk of HCV transmission by sexual activity between stable partners is low, but not absent, but no change in sexual practice is advocated for those in a stable sexual relationship.[1,13]

In the present study as many of the index cases and their spouses had an active disease therefore spouses if found positive were considered for treatment simultaneously.

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