**SEXUAL TRANSMISSION OF HEPATITIS C VIRUS IN SPOUSES OF PATIENTS SUFFERING FROM HEPATITIS C VIRUS**

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**ABSTRACT**

**Objective:** To find out whether sexual transmission is an important source of transmission of Hepatitis C Virus between spouses.

**Material and Methods:** This cross-sectional study was carried out in the department of Obstetrics and Gynaecology, Khyber Teaching Hospital and Department of Medicine, Lady Reading Hospital, Peshawar from January to December 2010. Serum samples from 92 index patients and their spouses were assayed for Hepatitis C Virus (HCV) antibodies and HCV RNA. In the couples positive for both, further HCV genotyping was done. A questionnaire addressing points such as additional risk factors for HCV infection, sexual behaviour or duration of partnership was completed by all couples.

**Results:** Sixty-three (68.5%) of the 92 spouses were male and 29 (31.5%) were female. Their mean age was 41.97 years ± 7.742. All had a sexual relationship with the study patient. Of them 14 (15.2%) were positive for anti-HCV antibodies, and eleven (12%) were also positive for HCV RNA. All the spouses’ positive for anti-HCV had no history of extramarital relationship and premarital hepatitis. In six couples the genotype was concordant (four had genotype 3a while two had 3b) and in five, the genotypes were discordant.

**Conclusion:** The heterosexual transmission of HCV is possible but infrequent in monogamous sex partners of patients with HCV viraemia. The risk of sexual transmission does not seem to correlate with intensity and duration of sexual exposure.

**Key words:** HCV RNA (Hepatitis C virus ribonucleic acid), genotypes, viraemia.

**INTRODUCTION**

The characteristics of HCV were firstly made possible through advanced gene technology in 1989 by Choo and coworkers. It was established as a major cause of non-B and non-C virus.¹⁻⁴ The most efficient routes of transmission is parenteral, by transfer of blood or blood products, by IV drug abuse, occupational needle stick injuries, hemodialysis and organ transplantation. Previous studies and systemic review has generally concluded that Hepatitis C Virus can be transmitted between spouses but the risk of transmission is low. In about 30-40% of HCV cases, the route of transmission remains unclear.⁵

Sexual Transmission or other close contacts could play a role in these sporadic or common acquired infections. Many studies have addressed this question and achieved somewhat conflicting results. The high prevalence of HCV found in prostitutes,⁶ male homosexuals,⁷⁻⁹ sex partners of patients infected with both HCV and Human Immunodeficiency Virus¹⁰ and patients attending sexually-transmitted-disease clinics,¹¹⁻¹² suggests that sexual transmission may be a route of infection. Other studies, however, having investigated monogamous sex partners of HCV-infected transfusion recipients and of patients with acute or chronic hepatitis C, reveal infrequent or no sexual HCV transmission.¹³⁻¹⁹

**MATERIAL AND METHODS**

From January to December 2010, spouses of 92 patients with chronic HCV-associated liver disease were screened for HCV infection in Gynaecology department Khyber Teaching Hospital and department of medicine, Lady Reading Hospital, Peshawar. A total of 92 patients were enrolled: 63 women (68.5%) and 29 men (31.5%) with a mean age of 41.97 years ± 7.742. In the majority of cases the etiology and duration of HCV infection were unknown; in about 50 (54.4%), parenteral exposure was considered to be the source of infection.

The couples completed a questionnaire addressing the occurrence of premarital non-A,
non-B hepatitis or other liver diseases, history and timing of blood transfusion or injuries by needle stick, use of illicit intravenous drugs, tattoos and piercings, duration of their present marriage, sexual activity, such as weekly frequency of intercourse, the use of condoms, extramarital relationships, sharing of personal hygiene implements such as toothbrush or razor, and at least weekly alcohol intake and nicotine consumption. Patients with extramarital affairs, HCV positivity before marriage, associated HBs Ag and HIV infection were excluded from the study.

Serum samples from study patients and their spouses were collected and assayed for anti-HCV with a second-generation assay (Abbott Laboratories). Serum HCV RNA was detected by reverse-transcription nested polymerase chain reaction (PCR) with primers deduced from the 5'-noncoding region (Amplicor, Roche Diagnostic Systems). HCV genotypes in spouses and corresponding patients were determined by a PCR typing assay (Inno-Lipa HCV 2, Innogenetics).

RESULTS

Sixty three (68.5%) of the 92 spouses were male and 29 (31.5%) were female. Their mean age was 41.97 years ± 7.742. All had a sexual relationship with the study patient. The couples were divided into five groups according to the duration of partnership as shown in Table 1. The mean length of sexual relationship was 21.4 years. The average rate of sexual intercourse was 1.6 per week. All the 92 spouses were negative for hepatitis B surface antigen. Of them fourteen (15.2%) were positive for anti-HCV antibodies, and eleven (12%) of them were also positive for HCV RNA. All the spouses positive for anti-HCV had no history of extramarital relationship and premarital hepatitis. All were sexually active with the study patient.

The genotyping was done in spouses who were HCV RNA positive. In 6 couples the genotype was concordant (4 were having genotype 3a while 2 were having 3b) an another 5 spouses Genotype was discordant. In two of the discordant cases the partners were nurses who had suffered several needle-stick injuries and were infected with genotype 3b, while their partners were infected with genotype 3a. Other cases were also giving history of blood transfusions in the past. Analysis of the questionnaires completed by the six couples with concordant HCV genotypes showed that no case had an additional risk factor for HCV infection.

DISCUSSION

The heterosexual transmission of HCV is possible but infrequent in monogamous sex partners. Previously transfusion of blood and blood products was the classical source of infection, but now it is believed that drug and sexual exposure accounts for most of HCV transmission. The source of infection is unknown in 30-40% of all HCV infections. It is believed that sexual and interfamilial transmission are possible routes of transmission. Reported risk of heterosexual transmission is between 0.27%.13-17

The highest rate for heterosexual transmission is reported in Far East or south East Asia20,21 which was between 17-27%. Older age and long duration of marriage were reported as most evident risk factors. In western societies there is little evidence to show that sexual transmission of HCV is of epidemiological importance. Few studies reported high rates of transmission between 11 to 14%22,23,24 but the sample size was small and unreadable screening methods (First generation Elisa) were used. Other studies13-19,24,25 showed there low or absent risk of sexual transmission.

Our study finds no convincing evidence for the heterosexual transmission of Hepatitis C. The HCV seroprevalence in spouses of patient with chronic HCV infection is 12%. Sexual transmission appears possible in only 6.5% assessed on the basis of HCV genotyping. This is some what comparable to the study conducted in Turkey where it is only 2%.26 Thus there is no increased risk of couples acquiring HCV through sexual relationship. This finding is also supported by the fact that there was long lasting sexual partnerships (median sexual relationship was for 21.4 years) and unprotected sex in the study sample. Evaluation of the questionnaires and statistical analysis revealed no risk factors for HCV transmission in the everyday life of couples. Sex, duration of marriage, sexual behavior and condom use do not influence the risk of interspousal transmission. However our sample size is small and studies on larger samples are needed to draw more conclusions. Larger studies from Italy conclude that sexual transmission does not play a significant role.24,25

CONCLUSION

The heterosexual transmission of HCV is possible but infrequent in monogamous sex partners of patients with HCV viraemia.
REFERENCES


