

RISK FACTORS OF HEPATITIS C INFECTION IN PATIENTS OF CHRONIC LIVER DISEASE IN A RURAL AREA OF UTTAR PRADESH

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ABSTRACT

Hepatitis C is an infectious disease affecting the liver, caused by the hepatitis C virus (HCV). The infection is often asymptomatic, but once established, chronic infection can progress to scarring of the liver, and advanced scarring cirrhosis which is generally apparent after many years. In some cases, those with cirrhosis will go on to develop liver failure or other complications of cirrhosis, including liver cancer. HCV infection is chronic in 75% to 85% of infected individuals, approximately 18 million people in India are estimated to be infected with HCV. The present study was carried out to detect the prevalence of HCV infection in patients of chronic liver diseases and find out risk factors responsible for transmission of infection in central part of rural UP. A total number of 300 patients, in the age range between 10 - 70 years of either sex admitted in Major SD Singh Medical College hospital, Farrukhabad (UP) were included in the study. 12 cases (4%) were detected to be positive for anti-HCV antibodies, of which 7(58.3%) were males and 5(41.7%) females showing a sex ratio of 1.4:1. Presenting symptoms were loss of appetite, nausea, vomiting, headache etc. Major risk factors identified in the study were needle prick, dental procedures, blood transfusion, major surgery etc. Study revealed a lower prevalence of HCV infection in this part of country, than what was reported earlier from other parts of country. Study reaffirmed that risk factors attributable to causation of hepatitis C infection are preventable and prevalence of infection with hepatitis C virus can be reduced by health education and basic hygiene measures aiming at general population and medical personnel.

KEYWORDS : Chronic Liver Diseases, HCV, Risk Factors

Hepatitis caused by Hepatitis C virus (HCV) has become a major emerging infectious disease of liver and is a cause for large number of cases of parenteral non-A non-B hepatitis. Hepatitis C Virus was discovered in the year 1989 and has structure different from prevailing hepatitis A and B virus, hence named as hepatitis C virus (HCV). HCV is an RNA virus of the family Flaviviridae, with an approximate diameter 40-50nm.

Hepatitis C virus infection has been identified as a major health problem worldwide. Epidemiological data with regard to HCV infection is limited; hence prevention and treatment have limited options. Despite various preventive measures with regard to blood screening, health education, awareness and other hygienic measures, HCV poses danger to human health in developing world and is one of the most common blood-borne infections (Lo Re, 2005).

In majority of cases, HCV remains undetected, due to its asymptomatic nature. Once established, chronic infection can progress to fibrosis of the liver tissue, and advanced scarring cirrhosis which is generally apparent after many years. In some cases, those with cirrhosis will go

on to develop liver failure or other complications of cirrhosis, including liver cancer (Ryan KJ et al., 2004). Infection with HCV like hepatitis B infection is associated with reduced survival and main cause of death among these patients is liver failure.

The HCV infection is a major cause of chronic liver disease, with >185 million infections worldwide. HCV infection is chronic in 75% to 85% of infected individuals. It has been estimated that approximately a quarter of a million deaths per annum occur due to chronic liver disease associated with HCV (Lo Re, 2005).

Various workers have reported prevalence of HCV in liver disease patients to be between 5-10%. Amarapurkar et al., (1992) from western India reported that among 126 patients of chronic liver disease, 21(16.6%) were anti-HCV positive and out of it 8(38%) had received blood transfusion previously. HCV was present in 15-20% of patients with chronic liver disease in Kashmir (Khuroo et al., 1993).

In a study conducted at Indore, prevalence of 4.85% among patients of acute viral hepatitis (AVH) and 25.64% among patients of chronic liver disease was reported (Jaiswal et al.,1996).10.8% patients of cirrhosis

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were HCV positive and dual infection of HCV and HBV was seen in 13.5% patients as reported by Sarin et al., (1996). Chatterjee et al., (2001) conducted a study in Calcutta among 84 patients (62 of cirrhosis, 22 of chronic hepatitis) and reported that 8.33% patients with chronic hepatitis, 8.06% patients with cirrhosis and 9.09% of chronic active hepatitis were HCV positive.

At the beginning, it was presumed that HCV is primarily transmitted through blood transfusion and intravenous drug abuse. Epidemiological studies revealed that HCV infection can be transmitted by other routes also, like unsafe injections (reuse of glass syringes or needles by unqualified medical personnel), vertical transmission from mother to child, non-sexual contacts in households, tonsuring, face or armpit shaving at community barber shops, ear piercing, tattooing and inadequately sterilized surgical or dental instruments. Studies from Pakistan reported re-used syringes and frequent therapeutic injections as major risk factors (Waheed et al., 2009), who identified use of contaminated syringes as leading risk factor for causation of HCV infection. Dental and medical procedures also carry a significant risk of transmission of Hepatitis C infection. In Turkey, the most common risk factor for transmission of HCV is surgery (Karaca et al., 2006). In one study, blood transfusion was found to be a major risk factor and frequency was almost same as with one transfusion (13.2%) as with multiple transfusions (15.4%) (Rizvi and Fatima, 2003). In a study in Pakistan, shaving by barber was found to be a major risk factor, barbers in rural areas use the same blade on different customers, they are unaware that transmission of infection can occur through unhygienic use of shaving tools. Mele et al., (1995) in Italy reported that tattooing, ear-piercing and barber shop shaving were associated with transmission of hepatitis virus infection. In China, prevalence of infection with anti-HBc was found to be high (39.2%) among barbers.

With this background and HCV infection being identified as a major precursor of advanced liver pathology such as liver fibrosis, cirrhosis, liver cancer and liver failure, present study was planned to study prevalence of HCV infection in central part of rural area of UP and identify various risk factors, that are responsible for the transmission

of infection. Identification of risk factors would help in further consolidating the preventive measures aiming at reducing and eliminating HCV infection with serious consequences.

MATERIALS AND METHODS

The present study was undertaken over a period of two years from December 2012 to December 2014 on 300 clinically diagnosed cases of chronic liver disease with 3 to 6 months of history of liver disease. Detailed history was taken, presenting signs and symptoms were recorded, an in depth probe was made with regard to exposure to probable risk factors. Blood samples were also collected after obtaining written consent and pre-test counselling. Liver function test and liver biopsy of all patients were conducted and findings recorded. Anti-HCV antibody by invitro ELISA was done by 3rd generation Kit (ERBA ELISA TEST HEP C, TRANSASIA Biomedicals Ltd). The tests were performed according to the manufacturer's instructions provided in the kit. Tests were also carried out for detection of antibody against hepatitis B infection also, which has been analysed and reported separately. Present study results focus on Hepatitis C infection only.

RESULTS AND DISCUSSION

Out of 300 cases of chronic liver diseases included in study, 109 (36.3%) were positive for HBsAg. 11 no's (3.7%) were positive for antibodies against HCV, and one case (0.33%) has dual infection with hepatitis B and C (Table 1). Presenting symptoms are enumerated in table 2; main symptoms were anorexia, nausea, vomiting, headache, joint pains, loss of weight etc. (Table 2), all

Table 1: Serological Markers in Patients of Chronic Liver Disease

Elisa Test Performed	Study Group (n=300)		
	Total (%)	Male	Female
HbsAg only	109 (36.3)	77(70.6%)	32(29.4%)
Anti HCV only	11(3.7)	7(63.6%)	4(36.3%)
HBsAg and anti HCV	1(0.33)	0(%)	1(100%)
Total cases	121	84 (69.2%)	37(30.8%)

Table 2 : Signs and Symptoms in Hepatitis C Sero-Postive Patients

Common Symptoms Associated with HCV Cases	Patients No.	%
Anorexia	10	83.3
Fatigue	10	83.3
Nausea	9	75
Vomiting	8	66.7
Headache	8	66.7
Fever	8	66.7
Swelling of abdomen	8	66.7
Arthralgia	7	58.3
Loss of weight	5	58.3
Yellow Discoloration of Sclera	6	50
Pruritus	4	33.3

Table 3 : Risk Factors (Probable Mode of Acquisition) in HCV Seropositive Patients

Risk Factors	Patient No.	%
Needle prick	4	33.3
Dental procedure	1	8.3
Blood transfusion	1	8.3
Contact with sex workers	1	8.3
Major surgery	1	8.3
Injectable drugs	1	8.3
Unknown	3	25

suggestive of chronic liver pathology. These were corroborated with serological findings. A probe with regard to risk factors revealed that needle prick or multiple injection, dental procedure, Blood transfusion, contact with sex worker and surgery etc. as main cause of infection with hepatitis C virus, among patients under study (Table 3). Three patients could not recollect exposure to any listed risk factor even on repeated questioning.

Present study conducted among 300 patients of chronic liver diseases in a rural area of UP has found a prevalence of 4 % of HCV infection. Prevalence in present study has been found to be lower than that reported by other workers, 5-10% in northern India, in western India it was found to be 16.65 % among cases of CLD, 5.64% among patient of CLD in Indore by and 8.33% among patient of chronic hepatitis. Above mentioned findings corroborate the fact that there are regional variations of prevalence of HCV infection within country depends on exposure to local risk factors, attitude, practices and knowledge among

general populations and medical professionals, however one fact emerges from the studies that there is a gradual reduction in prevalence of HCV infection over a period of time. This can be attributed to better understanding of dynamics of transmissions of HCV infections and improved awareness, improved preventive practices among masses and medical professionals.

Present study has found needle prick as major risk factor for transmission of HCV, other risk factors identified were dental procedure, blood transfusion, and contact with sex workers, surgery etc. Three patients could not assign any specific risk factor.

Basu et.al.,(2015) reported that four risk factors found strongly associated with HCV positivity were sharing syringes, reuse of injections accessories, blood transfusions and drug abuse, they also observed that lower age of onset of drug use was independently associated with HCV risk. In the drug users HCV positivity was associated with several clinical, behavioural and personality risk factors.

Reuse of disposable syringes and needles after soaking in the boiler or bowl with tepid water is common. In a study in Pakistan, authors reported that the proportion of injections per prescription is very high when compared to some other countries. Giving intravenous drips, vitamin injections and antibiotics is common in the countryside. Lack of awareness of risks associated with injections and strong belief in the fast and powerful action of injections are driving injection overuse. Parenteral drug administration is a good monetary incentive for practitioners as well.

William (2011) in a review of HCV epidemiology in Asia noted that despite implementation of national blood policy by the government, blood transfusion in India carry a higher risk of infection through use of replacement blood donors, though paid donation is illegal, many professional donor posing as friend or relative donate blood. In their opinion private as well as government blood banks needs more stringent control and monitoring. There are significant nosocomial risk factors for hepatitis C transmission associated with clinical situations where patients receive blood. In one study, anti HCV frequency after one unit blood transfusion was almost the same (13.2%) as after multiple transfusions (15.4%).

It have also been reported that tattooing and history of minor and major surgery as major risk factors. In Turkey, the most common risk factor for the transmission of HCV infection is surgery. Various workers suggested that percutaneous exposure through minor routes of transmission like multiple uses of unsafe injections and procedures by private medical practitioners and dental surgeons, sharing of shaving kits, and visiting road side barbers play an important role in HCV transmissions.

While analysing the results of various study and comparisons with the results of present study brings out the fact that there is gradual reduction in prevalence of HCV infection, due to various risk factors. This can be attributed to improved knowledge with regard to transmission of infection, improved hygiene and practices etc. However there still exists a gap, that need to be addressed. Further improvement in basic hygiene and strict adherence to universal precautions is essential to prevent iatrogenic transmission of the infection. The prospects of a vaccine for HCV are still remote. So, great stress must be laid on proper preventive measures such as use of disposable syringes, strict instrument sterilization practices, stringent screening of blood donors, safe sexual practices, proper disposal of contaminated material etc. This will help in reducing the risk factors and incidence of infection with Hepatitis C Virus infection (Ryan and Ray, 2004).

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REFERENCES

- Amarapurkar D. N., Kumar A., Parikh S. S., Chopra K. B., Murti P., Kalro R. H. and Desai H. G., 1992. HCV infection in chronic liver disease in Bombay. *Ind J Gastroenterol.*; **11**(4): 162-3.
- Basu D., Sharma A. K., Gupta S., Nebhinani N. and Kumar V., 2015. Hepatitis C virus (HCV) infection & risk factors for HCV positivity in injecting & non-injecting drug users attending a de-addiction centre in northern India. *Indian J Med Res* **142**, 311-316.
- Chatterjee C., Mitra K., Hazra S. C., Banerjee D., Guha S. K and Neogi D. K., 2001 . Prevalence of HCV Infection among Patients of Chronic Active Hepatitis and Cirrhosis cases in Calcutta. *Indian Journal of Medical Microbiology*, **19**(1): 46-47.
- Jaiswal S. P., Chitnis D. S., Naik J. S., 1996. Prevalence of anti HCV antibodies in Central India. *Indian J Med Res.*, **104**:177-81.
- Karaca C., Cakalođlu Y., Demir K., Ozdil S., Kaymakodlu S. and Badur S., 2006, Risk factors for the transmission of hepatitis C virus infection in the Turkish population. *Dig Dis Sci.* **51**:36-59
- Khuroo M. S., Dar M. Y., Zargar S. A., Khan B. A., Boda Ml and Yattoo G. N., 1993. Hepatitis C Virus antibodies in acute and chronic liver disease in India. *Journal of Hepatology*, **17**:175-179.
- Lo Re 3rd, Kostman J. R., 2005. Management of chronic hepatitis C. *Postgrad. Med. J.* **81**:376-82.
- Mele A., Corona R., Tosti M.E, Palumbo F., Moiraghi A. and Novaco F., 1995. Beauty treatments and risk of parenterally transmitted hepatitis: results from the hepatitis surveillance system in Italy. *Scand J Infect Dis.*, **27**:441-4
- Rizvi T. J., Fatima H., 2003. Frequency of hepatitis C in obstetric cases. *J. Coll. Physicians Surg. Pak.* **13**:688-90
- Ryan K. J. and Ray C. G., 2004. *Sherris Medical Microbiology* (4th ed.), McGraw Hill. : 551-2.
- Sarin S. K., Gupta R. C., Banerjee K. and Khandekar P., 1996. Low prevalence of hepatitis c viral infection in patients with non-alcoholic chronic liver disease in India *JAPI*, **44**(4) 243-5.
- William Sievert1 et. Al., 2011. A systematic review of hepatitis C virus epidemiology in Asia, Australia and Egypt, *Liver International* . John Wiley & Sons A/S.
- Waheed Y., Shafi T., Safi S. Z. and Qadri I., 2009. Hepatitis C virus in Pakistan: A systematic review of prevalence, genotypes and risk factors. *World J Gastroenterol.*, **15**(45): 5647-5653.