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Full Length Research Paper

Haryana in Grip of Hepatitis C

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Abstract

Hepatitis C virus (HCV) is a major cause of liver disease worldwide. The impact of this infection is just emerging in India. The focus of study was epidemiological profile of patients suffering from hepatitis C and major risk factors associated. The epidemiology of hepatitis C in India has not been studied systematically. The burden of hepatitis C infection in Haryana has reached a significant level. It is more common in the young males belonging to rural areas. Genotype 3 is the most prevalent followed by genotype 4 which has not been reported from Northern India till now to such an extent. There is lack of awareness, hygiene and shortage of health facilities and there is need to organize public awareness and health education campaigns targeting healthcare providers, private practitioners, and the public. The study aim to study Epidemiological profile in patients infected with Hepatitis C Virus reporting to Hepatitis C nodal center in Haryana and to assess the various risk factors, genotypes and geographic foci of the disease. It was an epidemiology based, prospective study conducted at medical gastroenterology department of our institute over a period of five years. The record of each patient was meticulously maintained in the department. In this study 2500 patients confirmed for hepatitis C infection by PCR analysis were enrolled. Majority of the subjects were married male and came from rural residential areas. The age distribution curve showed a sharp peak between the age group 20 to 35 years. The districts bordering Punjab were having more prevalence in comparison to other parts. History of previous surgery and tattooing appeared as major risk factors. Majority of the patients were asymptomatic. Most of them were found to have HCV infection at screening camps followed by screening during preanaesthetic checkups and blood donation. Genotype 3 was the most common followed by genotype 4 and Genotype 1. The burden of hepatitis C infection is more in the young males especially in the rural areas. The reason for this could be lack of awareness, hygiene and shortage of health facilities for which need is to organize public awareness and health education campaigns targeting healthcare providers, private practitioners, and the public. In order of the prevalence of disease we can formulate strategies and prioritize accordingly. The most important risk factors are use of unsterilized needles and other equipment. Tattooing has emerged as a major player here. It is a common practice and it is imperative to make people aware of the risks associated with it. Genotype 3 is the most prevalent. But genotype 4 is also emerging.

Keywords: Chronic hepatitis C, Genotypes, Viral load, Blood transfusion, Recycled syringes.

INTRODUCTION

Hepatitis C virus (HCV) is a major cause of liver disease worldwide and global prevalence of Hepatitis C virus (HCV) infection is around 2%, with 170 million persons chronically infected with the virus and 3 to 4 million persons newly infected each year. Although HCV is endemic worldwide, there is a large degree of geographic variability in its distribution. Countries with the highest reported prevalence rates are located in Africa and Asia. (*Shepard et al., 2005*).

The impact of this infection is just emerging in India. The risk factors most frequently cited as accounting for the bulk of HCV transmission worldwide are blood transfusions from unscreened donors, injection drug use,

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unsafe therapeutic injections, and other health-care related procedures. The worrying aspect of acute hepatitis C infection is that spontaneous viral clearance is unusual with nearly 54%-86% of the infected individuals progressing to chronic hepatitis (*Alter et al., 1992; Hoofnagle, 2002; Missiha et al., 2008*). Approximately a fifth of the patients with chronic hepatitis C progress to cirrhosis over a time spanning nearly a decade (*Liang et al., 2000*).

The focus of study was epidemiological profile of patients suffering from hepatitis C and major risk factors associated. The epidemiology of hepatitis C in India has not been studied systematically. The subjects were confirmed hepatitis C patients on Polymerase chain reaction (PCR) testing. The records of all these patients were meticulously maintained and since the patients visited the clinician every week under the treatment regime, contact with every patient and follow up was regular.

The estimated global prevalence of HCV infection is 2.2%, corresponding to about 130 000 000 HCV-positive persons worldwide (Shepard et al., 2005). Because many countries lack data, this estimate is based on weighted averages for regions rather than individual countries. Region-specific estimates range from < 1.0% in Northern Europe to > 2.9% in Northern Africa. The lowest prevalence (0.01%-0.1%) has been reported from countries in the United Kingdom and Scandinavia; the highest prevalence (15%-20%) has been reported from Egypt (Alter et al., 1992; Hoofnagle, 2002). An estimated 27% of cirrhosis and 25% of HCC worldwide occur in HCV-infected people (Missiha et al., 2008).

The epidemiology of hepatitis C in India has not been studied systematically and prevalence of hepatitis C is blood banks based with the assumption that the blood donors are a surrogate for the population at large. However, with the advent of professional donors this assumption may be a fallacy.

Hepatitis C is an emerging infection in India whose long term implications will be felt in the decades to come. It is a pathogen that is already responsible for a significant proportion of liver disease in various regions of India. The advent of the HIV epidemic may further add to the existing load of HCV infection in the country. Stringent blood banking laws need to be introduced and sterilization and reuse of needles discouraged. All this is not possible without increased public awareness of the magnitude and implications of this chronic infection and its mode of spread. Health authorities have to consider hepatitis C as a disease which can result in significant morbidity and mortality in the years to come. The high risk of chronicity of this blood-borne infection and its association with hepatocellular carcinoma underscores its public health importance. To study Epidemiological profile in patients infected with Hepatitis C Virus reporting to Hepatitis C nodal center in Haryana and to assess the various risk factors, genotypes and geographic foci of the disease.

MATERIALS AND METHODS

It was an epidemiology based, prospective study conducted at medical gastroenterology department of our institute over a period of five years. The record of each patient was meticulously maintained in the department. In this study 2500 patients confirmed for hepatitis C infection by PCR analysis were enrolled.

OBSERVATIONS AND RESULTS

In this study 2500 records were reviewed and the information was analyzed.

Demographic profile

Majority of patients (65%) were males (Figure1), 81% patients belonged to rural areas (Figure 2) and 84 % were married (Figure 3). The age distribution curve shows a sharp peak between the age group 20 to 35 years. 38% patients lie in this age group. About one fourth (26.02%) of the patients lie in the age group 35 to 45 years. 3.32% patients belong to age group 11-20 yrs. and 1.03% of the patients are over 60 years of age, (Figure 4).

More than one third (37.37%) of the patients were from Kaithal alone. Kaithal and Fatehabad together made up 60% of the subjects attending the hepatitis C clinic in our sample. Patients from Karnal (10.6%), Jind (9.84%) and Panipat (8.08%) also have substantial representation in the sample. The districts bordering Punjab were having more prevalence in comparison to other parts (Figure 5).

In our sample of patients history of previous surgery and tattooing appear as major risk factors. 31.73 % patients have a history of a major or a minor surgery and 31% of patients have history of tattooing. A substantial number (12%) of patients have history of receiving blood transfusion, 23.46% of the patients had a history of jaundice sometime in the past. Only 4.26% of the patients had a history of I.V drug abuse and 4% had a history of sexual relations with multiple partners. None of the patients in this sample had a history of dialysis (Figure 6).

60% of the patients were asymptomatic. Most of them were found to have HCV infection at screening camps followed by screening during preanaesthetic checkups and blood donation. Malaise (10.25%), pyrexia of unknown origin (7.25%), diffuse abdominal pain (5.75%) and joint pain (4.5%) were the major complaints in the symptomatic patients. Figure 7.

In this study sample genotype 3 is the most common (68 %). Curiously even genotype 4 (16 %) and Genotype 1(13.30%) has substantial presence. Genotype 5 and 6 was seen only in 0.2% and 0.1% respectively. There was only one case of genotype 2. Genotype could not be determined in 2.40% patients due to low viral load. Figure 8.

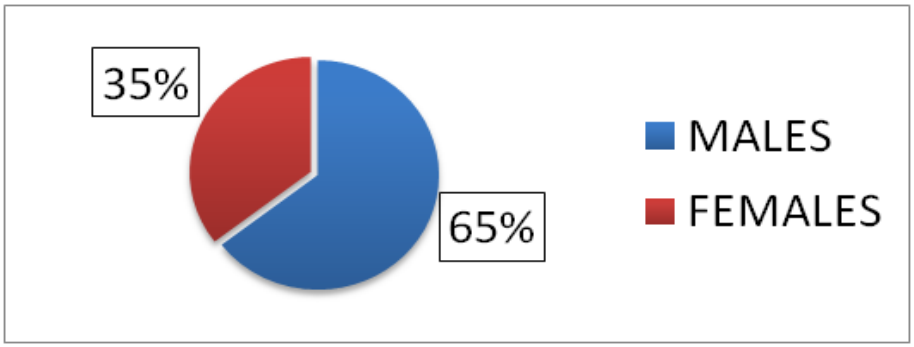

Figure 1. Majority of the subjects (65%) were male. Only 35% of the participants were females

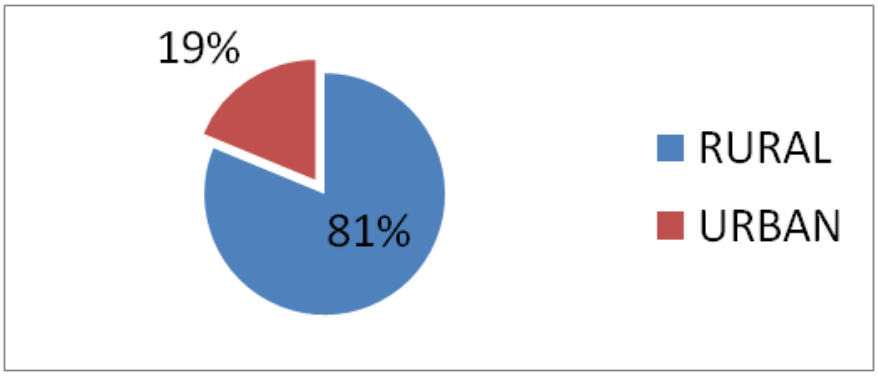

Figure 2.81% of the subjects came from rural residential areas

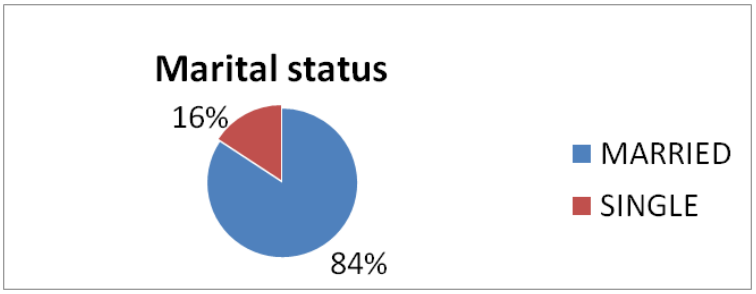

Figure 3. 84% of the subjects were married

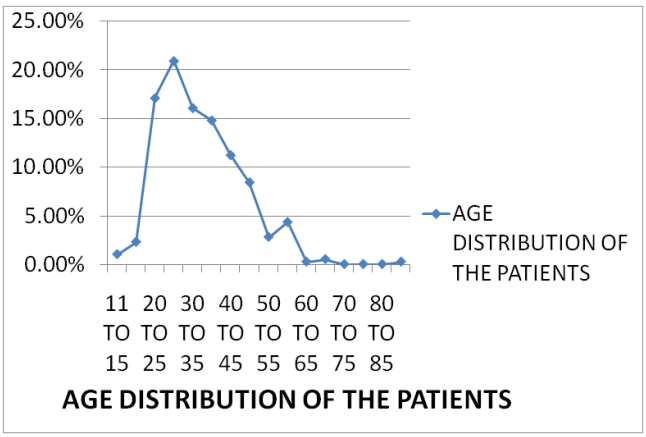

Figure 4. Showing characteristic peak in younger age group

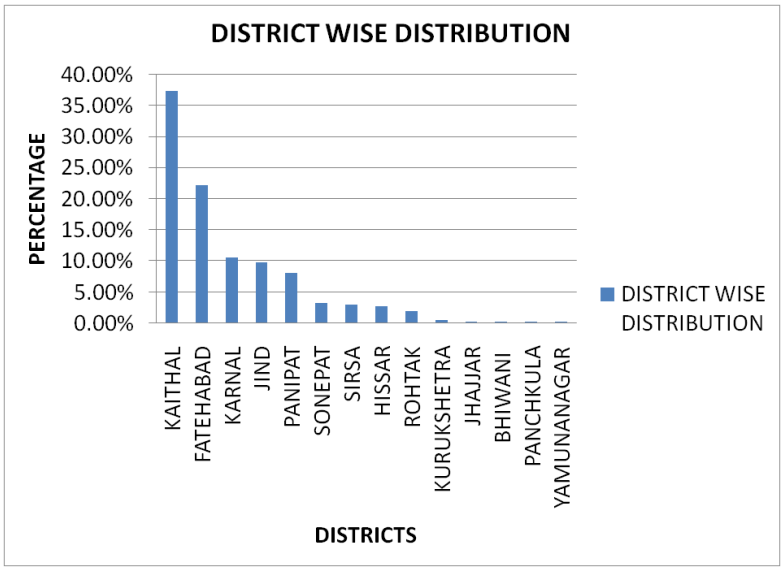

Figure 5. Districts bordering Punjab have highest prevalence

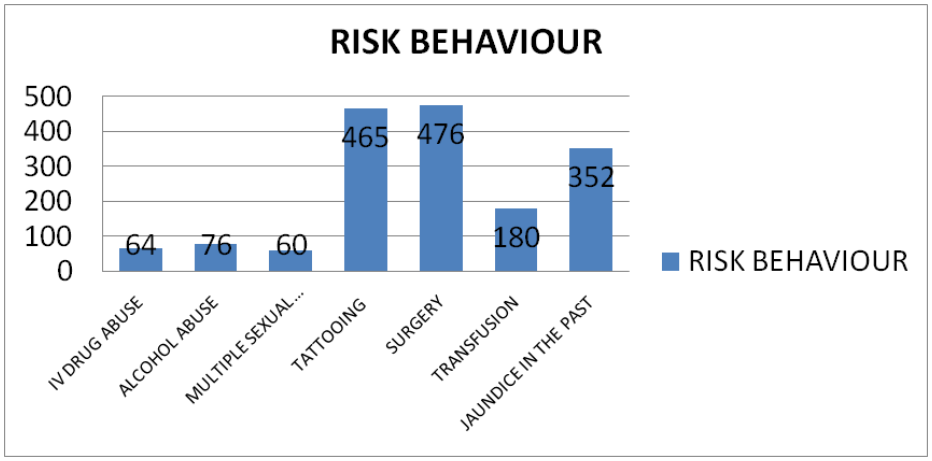

Figure 6. Previous history of Tattooing and blood transfusion are important risk factor

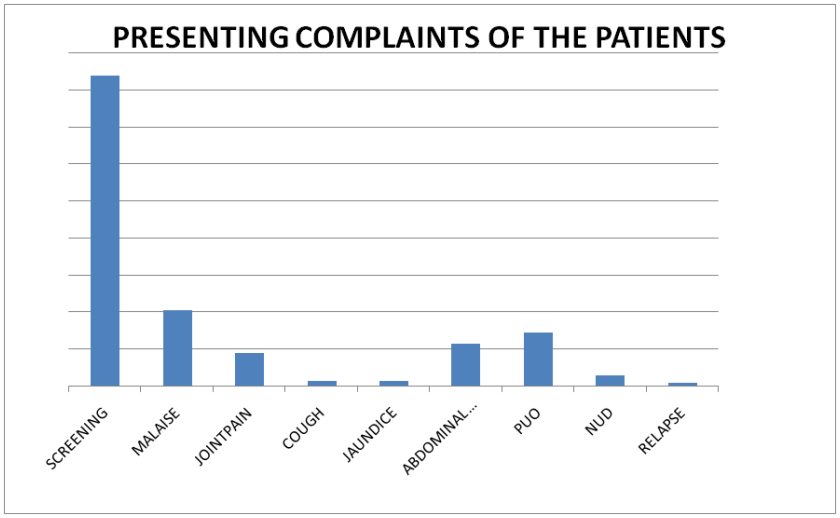

Figure 7. Majority of patients were asymptomatic and detected during screening camps

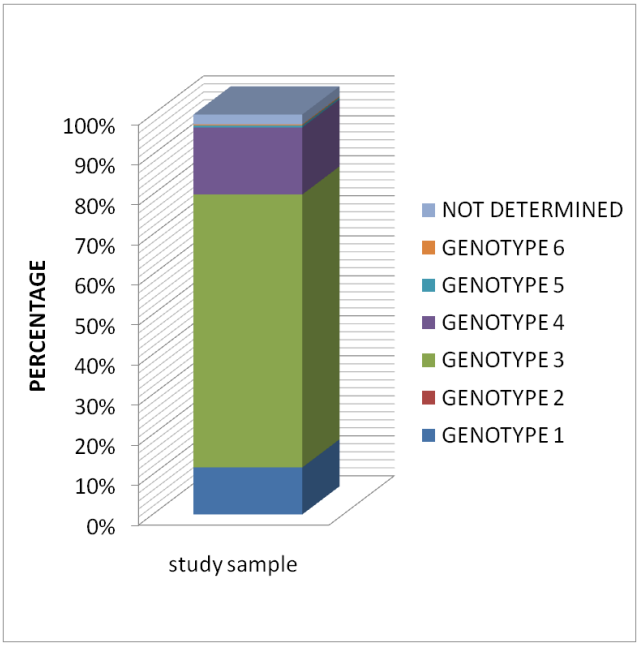

Figure 8. Showing Genotypic distribution among patients

Alternate medication

1750 (70%) patients out of cohort of 2500 patients had taken alternative medicines prior to starting of treatment from our center.

Co infections

Thirty five patients (1.4%) in the sample were having HBsAg co infection.
Twenty eight (1.1%) patients in this sample had HIV co infection.

DISCUSSION

HCV infection has likely been endemic in many populations for centuries. However, the wave of increased HCV-related morbidity and mortality that we are now facing is the result of an unprecedented increase in the spread of HCV during the 20th century. Two 20th century events appear to be responsible for this increase; the widespread availability of injectable therapies and the illicit use of injectable drugs.

There are both geographic and temporal differences in the patterns of HCV infection (Missiha et al., 2008). In the United States, prevalence is highest among persons 30-49 years old, who account for two-thirds of all infections, and lower than average among persons less than 20 and greater than 50 years old(Liang et al., 2000; Choo et al., 1989). This pattern indicates that most HCV transmission occurred in the last 20-40 years, and primarily among young adults, a pattern similar to that observed in Australia (Choo et al., 1989). In the United States(Martell et al., 1992; Simmonds et al., 2000), Australia (Global Burden Of Hepatitis C Working Group, 2004), and countries in western and northern Europe with similar HCV epidemiology (Shepard et al., 2005, Frank et al., 2000), the greatest variations in prevalence occur among persons with different risk factors for infection. In contrast, the age-specific prevalence of HCV infection increase steadily with age in Turkey, Spain, Italy, Japan, and China(Perz et al., 2006; Mukhopadhya, 2008; Donahue et al., 1992; Hazra et al., 2002; Jaiswal et al., 2001). In these countries, there are hyper endemic areas of the country in which older persons have an HCV prevalence 20-fold greater than the average overall and 1.5-2-fold greater than the prevalence among older persons in other areas of the country(Saha et al., 2000; Arankalle et al., 1995; Gosavi et al., 1997; Chandra et al., 2004). The highest HCV prevalence in the world occurs in Egypt, where the prevalence of infection increases steadily with age, and high rates of infection are observed among persons in all age groups (Alter et al., 1992; Agarwal et al., 1999). This pattern indicates an increased risk in the distant past followed by an ongoing high risk for acquiring HCV infection, although there are regional differences in average overall prevalence (Hoofnagle, 2002; Reddy et al., 2005).

In our study we found that infection is more prevalent in the young adults. There is a sharp peak in the age group 20 to 30 years and a substantial prevalence till 45 years of age. There are very few patients in the extremes of age groups that are less than 20 years and more than 60 years. In a population based study from Ratia showed that the maximum number of hepatitis C cases, 486 (29.8 per cent), were in the age

group 31–40 years and only 0.8 per cent of cases were in the 0–10 year age group. (Verma et al., 2014)

The maximum cases were from Kaithal district of Haryana followed by patients from Fatehabad. We assume a temporal association between the risk factors such using unsterilized needles, syringes, and equipment and the high incidence of patients from these areas as compared to the others. Determining the incidence of HCV infection (i.e., the rate of newly acquired infections) is difficult because most acute infections are asymptomatic, available assays do not distinguish acute from chronic or resolved infection, and most countries do not systematically collect data on cases of acute disease. Even in countries with well-established surveillance systems, acute disease reporting systems underestimate the incidence of HCV infection(Arankalle et al., 1995; Irshad et al., 1995; Ganju and Goel, 2000).

The most efficient transmission of HCV is through large or repeated direct percutaneous exposures to blood (e.g., transfusion or transplantation from infectious donors, injecting drug use (Simmonds et al., 2000). HCV is less efficiently transmitted by single small dose percutaneous exposures (e.g., accidental needle sticks) (Simmonds et al., 2000; 27) or by mucosal exposures to blood or serum-derived fluids (e.g., birth to an infected mother, sex with an infected partner (Simmonds et al., 2000; Ramesh and Panda, 1992; Sarin et al., 2001).There is also evidence that the environment can serve as a reservoir for infectious virus. HCV transmission by in apparent percutaneous exposures has been caused by cross-contamination from reused needles and syringes, multiple-use medication vials, infusion bags, and injecting-drug use paraphernalia(Radhika et al., 2004; Alter, 2007). These epidemiologic data implicating transmission from environmental sources of HCV are supported by an experimental study that demonstrated the infectivity of HCV in blood after exposure to drying and storage at room temperature (Alter et al., 2000).

Because of the wide variety of human activities that involve the potential for percutaneous exposure to blood or blood-derived body fluids, there are numerous other biologically-plausible modes of transmission besides those with clearly-demonstrated epidemiologic associations with infection. These include cosmetic procedures (tattooing, body-piercing), intranasal drug use, and religious or cultural practices such as ritual scarification, circumcision, acupuncture, and cupping. In most regions of the world, there are insufficient data to determine whether these risk factors make any measurable contribution to overall HCV transmission. In those countries where adequate studies have been done, none of these activities have been consistently associated with HCV transmission (Martell et al., 1992; Abdel-Aziz et al., 2000).

We found that tattooing and history of minor or major surgeries were the leading risk factors in the sample studied. We assume that percutaneous exposure through minor routes of transmission like multiple uses of unsafe injections and procedures by private practitioners and dental surgeons, respectively, sharing of shaving kits, and visiting roadside barbers have played an important role in HCV transmission in these areas.

Risk factors such as blood transfusion were seen in 12% of the sample. Multiple sexual partners and i.v. drug abuse are not common in this sample. There is also some doubt about sexual transmission of this infection because the spouses of most of the chronic HCV infection patients were found to be negative for antiHCV antibodies on screening. In fact the extent to which HCV is transmitted by sexual activity and under what circumstances is one of the most controversial aspects of the epidemiology of hepatitis C. The results of different types of studies have been inconsistent. The strongest evidence for heterosexual activity as a risk factor for HCV infection came from case-control studies of persons with acute non-A, non-B hepatitis (now known as hepatitis C) in the United States during the 1970s and 1980s, which identified sex with an infected partner or with multiple partners as independently associated with acquiring disease (Sagnelli et al., 2005; Zhang et al., 2005). In contrast, no association was found with male homosexual activity, and cross-sectional studies conducted since 1990 of men who have sex with men (MSM) and heterosexual persons in long term monogamous relationships with a partner with chronic HCV have found little evidence for sexual transmission of HCV(Simmonds et al., 2000; Sarin et al., 2001). One possible explanation for these apparent inconsistencies is that HCV is more likely to be transmitted by sexual intercourse when the infected partner is in the early phase of acute infection; virus concentration is high and there is no antibody to complex with antigen.

Most of the HCV-related disease burden in developed countries has resulted from injection drug use, receipt of transfusions before donor screening, and high-risk sexual activity. In contrast, most of the disease burden in developing countries is related to receipt of unsafe therapeutic injections and contaminated blood, which is also true in our area. Characterizing the epidemiology of HCV infection in individual countries is crucial to developing and implementing effective preventive measures. In some, ensuring safe blood supplies and health-care related procedures are the highest priorities.

Larger differences have been noted in the HCV genome between strains from different geographical regions allowing the virus to be classified into six major genotypes (Simmonds et al., 2000). Genotype of the virus does not appear to influence disease presentation or severity of disease but has been identified as a major predictor of response to antiviral therapy. Most of the reported studies from India seems to suggest a north south divide, where in genotype 3 predominates in the

north, east and west India, whereas genotype 1 is commoner in south India (Mukhopadhya, 2008; Jaiswal et al., 2001)

Genotype 3 (68%) is the most common genotype in the sample studied. This data corresponds with the existing studies conducted in India. Surprisingly genotype 4 (16%) is the next most common genotype. Genotype 1 also had a significant incidence of 13.30%. We could not find any other reported study to compare the threat of the rising incidence of genotype 4 in Northern India. In a study, HCV-RNA and genotyping was carried out in 398 patients with chronic hepatitis C. It was found that Severe liver disease was present in 17 of 38 (45%) with genotype 1; in 1 of 3 (33%) with genotype 2; in 128 of 236 (54%) with genotype 3; 7 of 10 (70%) with genotype 4; and in 1 of 4 (25%) with mixed genotype.

Both HIV and HCV infection share the same routes of transmission and it is not surprising that co-infection of these viruses is common. The prevalence of hepatitis C infection in patients with HIV infection has been very variable. Hepatitis C infection is expected to ride piggy-back on the HIV epidemic and is bound to be a significant cause of morbidity in India. Both HIV-HBV and HIV-HCV co infections increase morbidity and mortality beyond those caused by each disease alone and significantly complicates medical management and burden on health systems (Choo et al., 1989; Martell et al., 1992). In our study 1.2% of the sample had HBV co infection whereas only 1% had HCV-HIV co infection. The main reason can be due to lesser number of patients had history of HIV, drug abuse or multiple sexual partners.

Conflict of Interest

No conflict of interest

CONCLUSION

The burden of hepatitis C infection in haryana has reached really at a significant level. It is more common in the young males belonging to rural areas. Genotype 3 is the most prevalent followed by genotype 4 which has not been reported from Northern India till now to such an extent. There is lack of awareness, hygiene and shortage of health facilities and there is need to organize public awareness and health education campaigns targeting healthcare providers, private practitioners, and the public.

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