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A Study of Clinical, Biochemical Profile and Risk Factor of Patients with Chronic Hepatitis C Virus Infection in Tertiary Care Centre in Kumaun, Uttarakhand.

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ABSTRACT

Background: Chronic Hepatitis C virus (HCV) infection is a major public health problem. It is a major cause for cirrhosis and hepatocellular carcinoma worldwide. HCV infection is recognized now days as a disease of global importance. It is considered a major health and economic burden in adults as well as children in both developing and developed countries. Objectives: To study the Clinical presentation, biochemical profile and risk factor of chronic hepatitis C virus infected patients. **Methods:** This prospective observational study was carried out in the Department of Medicine at STH, Haldwani, from August 2016 to July 2018.During these study period 110 patients with Chronic HCV infection were analyzed. **Results:** Out of 110 patients 60 (54.54%) were male and 50(45.45%) were female. Injection drug use (IDU) was the most common risk factor of HCV infection (20.90%). The abdominal discomfort symptoms seen in majority of patients (70%) followed by a fatigue (62.72%).and fever (60.90%). Males exhibiting more symptoms in comparison to females. **Conclusion:** Viral hepatitis is an important heath care problem in India as it occurs epidemically and sporadically. The variability in nature of the disease regarding its onset, presenting symptoms, clinical course and development of complications are important aspects. So, it is very essential for health care professionals to be aware of all aspects of it so that it is detected and treated early.

Keywords: ALT, AST, genotype, hepatitis C virus.

INTRODUCTION

HCV infection is recognized now days as a disease of global importance. It is considered a major health and economic burden in adults as well as children in both developing and developed countries.[1,2] Hepatitis C virus (HCV) infection is a major public health problem worldwide. About 170 million people are infected with HCV.[3] More than 3.5 million deaths occur annually due to HCV infection, most of death is due to development of cirrhosis of liver and hepatocellular carcinoma (HCC).[4]

Hepatitis C virus (HCV) is a small, enveloped, positive sense, single-stranded RNA virus of the Flaviviridae family.[5]

Lipid membrane formed by low density lipoproteins (LDL) and very low-density lipoproteins (VLDL) on the surface of the virion (given in grey). Viral core is given in blue and viral RNA is shown in orange. Heterodimers of glycoproteins E1 and E2 are partially embedded in the lipid bilayer and are forming 6 nm long spikes (projections) on the surface of the virion. As a result of association with LDL and VLDL, the morphology of the virion is not icosahedral. Depending on the viral source, the shape and size of the particles might vary.[5]

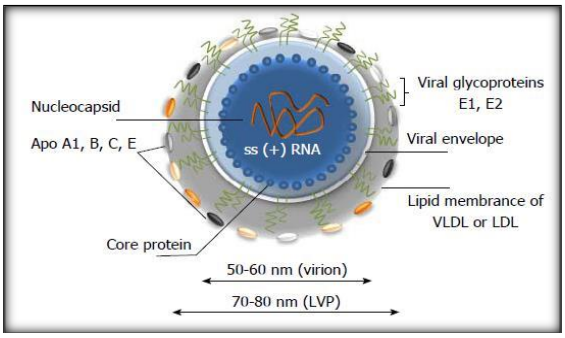

Figure 1: A model of hepatitis C virus lipoviral particle.

HCV was first cloned in 1989 after more than 6 years of work to extract the virus from infected

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patients by a group of scientists from California in the United States.[6] Viral hepatitis is the most common cause of liver disease in the world. Acute infections with their sequelae are responsible for 1-2 million deaths/year. Of them 54000 deaths are due to acute HCV infection.[2]

After acute infection with HCV, as many as 50%-85% of patients fail to clear the virus resulting in chronic infection with 350000 deaths/year and 955000 disability due to related complications such as cirrhosis and liver cancer.[7]

A recent systematic review found that globally between 1990 and 2005, the prevalence of people with anti-HCV has increased from 2.3% to 2.8%.[2] It is estimated that approximately 210 million individuals, i.e., approximately 3% of the world population, are chronically infected with HCV and 3-4 millions are newly infected each year.[1,8] Available data indicate that infection with HCV varies considerably by country and region, and the true burden of disease is not well known in many countries, because the capacity is often limited for collecting epidemiologic data.[4]

Prior to the 1990s, the principal routes of HCV infection were via blood transfusion, unsafe injection procedures, and intravenous drug abuse. These modes of acquisition are estimated to account for approximately 70% of cases in industrialized countries. Currently, new HCV infections are primarily due to intravenous or nasal drug abuse, and to a lesser degree to unsafe medical or surgical procedures. Parenteral transmission via tattooing or acupuncture with unsafe materials is also implicated in occasional transmissions.[8] The risk of heterosexual transmission is low, while recent data indicate that promiscuous male homosexual activity is related to HCV infection.[9]

In developing countries, insufficient screening of blood, blood products and parenteral exposure, continue to be the major causes of HCV transmission and are still reported among Egyptian children.[10]

Unsafe use and reuse of injection equipment in hospitals is still a threat in many parts of Africa.[11] Intra-familial transmission may occur, but specific immune responses may be protective against house-hold infection in some children.[11,12]

Hepatitis C virus infection can present as acute or chronic hepatitis. Acute hepatitis usually is asymptomatic and rarely leads to hepatic failure. Symptomatic acute HCV has a mild clinical course with <25% of patients presenting with jaundice. About 60–80% people with acute infection develop chronic infection.[13]

The rate of spontaneous viral clearance in patients with chronic HCV is very low. Approximately one fifth (20–30%) of patients with chronic HCV develop cirrhosis over a time period of 10–30 years. Among those with cirrhosis, 1–4% per year develops hepatocellular carcinoma.[14,15]

Deaths associated with chronic HCV are usually a result of the complications of decompensated cirrhosis and hepatocellular carcinoma. Survival rates decline rapidly with the onset of decompensation. The 5-year survival rate for patients with compensated cirrhosis is as high as 90% as compared to 50% for those with decompensated cirrhosis.[16,17]

Most patients with chronic HCV are asymptomatic or may present with nonspecific symptoms such as fatigue or malaise. Some of them may have arthralgia and myalgia. Patients with decompensated disease may display peripheral manifestations of cirrhosis, such as palmar erythema, spider nevi, Dupuytren's contracture, gynaecomastia, parotid enlargement, temporal muscle wasting, ascites, hepatosplenomegaly or testicular atrophy.

The diagnosis of HCV is made by the presence of anti-HCV antibody and HCV RNA in the blood. Further evaluation includes genotyping and quantifying HCV viral level, which usually is in the range of 0.2–5 million IU/ ml.

Basic laboratory tests like liver function tests, prothrombin time and hepatitisB as well as HIV serologies should be performed. Liver biopsy is often useful in making the correct diagnosis and determining the severity of inflammation and stage of fibrosis,[18] Since HCV prevalence is increasing and there is lack of knowledge and awareness regarding hepatitis C virus infection particularly in kumaun region and there is paucity of such data from this region. Our aim was to study the clinical profile of ANTI HCV antibody positive cases at our tertiary care hospital.

MATERIALS AND METHODS

This prospective observational study was carried out in the Department of Medicine at Susheela Tiwari Hospital(STH), Haldwani, Kumaun ,Uttarakhand from August 2016 to July 2018 .All the included patients were positive for Anti-HCV by ELISA. Patient's clinical details like age, gender, possible risk factors for HCV transmission, clinical profile and biochemichal parameter were recorded.

Inclusion criteria

All the patients diagnosed with anti HCV antibody positive presenting with or without symptoms and signs of hepatitis C infection. Symptoms includes either non-specific symptom like fever, myalgia, weakness, nausea, vomiting, jaundice, loss of appetite or specific feature like Hepatomegaly, Cirrhosis, Ascites, Hepatocellular carcinoma, and/or and increased in serum transaminase etc.

Exclusion criteria

These Patients were excluded who had a –

1. History of any illness which may result chronic liver disease like -
   a) Chronic alcoholism (significant)
   b) Metabolic causes

c) Co infection with HIV, HBV
d) HCV positive patient on antiviral therapy

2. Unwillingness of patient

The data obtained was entered in Microsoft Excel and exported to further statistical analysis was done using statistical package for social sciences (SPSS) version 20.

Standard descriptive statistical analysis was carried out as per demographic, biochemical and HCV viral load. The relationship was analyzed by comparing variables using Student t-test. Results were considered significant if p-value was less than 0.05.

RESULTS

Among 110 patients, 60 (54.54%) were male and 50 (45.45%) were female. The mean age of the study population was 41 years ± 15.84. The highest numbers of cases i.e. 26.36 % were found in the age group between 26 to35 years.

The probable risk factors for transmission of HCV infection was observed to be intravenous drug user (IDU) in 23 (20.90%) patients, history of blood transfusion in 10 (9.09%) patients, history of surgery in 18 (16.36%) patient, and injury with sharp instrument 7 (6.36%).Among 43(39.09%) patients with chronic HCV infection, risk factor for HCV transmission could not be identified. [Table 1]

Table 1: Distribution of patients on the basis of their risk factors

Risk factors	Number of patients (N=110)	Percentage (%)
History of blood transfusion	10	9.09
History of previous surgery	18	16.36
History of unprotected sexual exposures	9	8.18
History of use of percutaneous sharp instruments for various purposes	7	6.36
Unknown source	43	39.09
Intravenous drug abuser	23	20.90

Table 2: Nature of Symptoms of Chronic HCV infected patients

Symptoms	Number of patients (N=110)	Percentage (%)
Abdominal discomfort	77	70.00
Abdominal distension	19	17.27
Nausea	10	9.09
Blood mix vomiting	18	16.36
Black tarry stool	22	20.00
Jaundice	38	34.54
Diarrhea	3	2.72
Convulsion	7	6.36
Altered sensorium	12	10.90
Fever	67	60.90
Fatigue	69	62.72
Loss of appetite	24	21.81
Joint pain	5	4.54
Itching	16	14.54
Rashes	6	5.45
Dark urine	37	33.63
Asymptomatic	14	12.72

Among all the patient abdominal discomfort were reported by majority of patients 77 (70.00%) followed by Fatigue 69 (62.72%), Fever 67 (60.90%), & Jaundice 38 (34.54%), loss of appetite 24 (21.81%), Abdominal distention 19 (17.27%). Least common symptom was diarrhea, seen only in 3 (2.72%) cases. [Table 2]

In this study, Icterus 67 (60.90%) was most common sign, followed by Pallor 63(57.27%), Hepatomegaly 49 (44.54%), Ascites 20(18.18%), Splenomegaly 20 (18.18%). No clinical sign observed in 20 (18.18%) cases. [Table 3]

Table 3: Distribution of clinical signs of patients.

Signs	Number of patients (n=110)	Percentage (%)
Icterus	67	60.90
Hepatomegaly	49	44.54
Pallor	63	57.27
Lower limb edema	32	29.09
Flapping tremors	18	16.36
Ascites	20	18.18
Scratch mark	16	14.45
Splenomegaly	20	18.18
No clinical signs	20	18.18

Table 4: Distribution of hematological profile of patients

Hematological parameter	Range	Number of patients N=110	Percentage (%)
Hemoglobin (gm%)	<7	20	18.18
	>7	90	81.81
Platelet count (x104/cmm)	<1.5 lakhs	17	15.45
	>1.5 lakhs	93	84.54
Total leukocyte count (x103/cmm)	<4000	3	2.72
	4000 - 10000	99	90.00
	>10000	8	7.27
Total bilirubin (mg/dl)	<2	43	39.09
	>2	67	60.90
Alkaline phosphatase(U/L)	>180	40	36.36
SGPT (IU/L)	<40	49	44.54
	>40	61	55.45
SGOT (IU/L)	<40	41	37.27
	>40	69	62.72
Serum albumin (gm%)	<3.5	43	39.09
	>3.5	67	60.90
Prothrombin time (sec)	<18	83	75.45
	>18	27	24.54
Serum creatinine (mg%)	<1.4	98	89.09
	>1.4	12	10.90

The mean of hematological parameter in study population was- hemoglobulin(gm %) 11.7±1.5, Platelet count (x104/cmm) 309.7±79, Total leukocyte count (x103/cmm) 9.5±1,Alkaline phosphatase (U/L) 251.4±28.4. 18.18 % patients were having Hb< 7 gm%, 15.54 % cases were having platelet count < 1.5 lakhs , Total leucocyte count >10000 was observed in 7.27 % cases, Total bilirubin >2 in 60.9 %, Alkaline phosphatase >180 in 36.36 %, SGOT >40 in 62.72%, SGPT >40 in 55.45

%, Serum albumin <3.5 in 39.09 %, Prothrombin time >18 sec in 24.54 % and Serum creatinine>1.4 in 10.9% cases. [Table 4]

DISCUSSION

In this study 110 patients with chronic HCV infection were included. Among these patients 54.54% were male and 45.45% were female. More males were attending our OPD, it may be because of greater awareness than females. This can also be explained by greater number of male involved in drug abuse and having multiple sexual partners.

The mean age of the study population was 41 years ± 15.84. The highest numbers of cases i.e. 26.36 % were found in the age group between 26 to 35 years. Similarly study done by Piyush Mahajan et al had also reported similar result that the large proportion of our sample i.e., about 95% were in the age group of 15-44 years. Of these, maximum number (45.15%) of subjects belonged to the age group of 25-34 years.[19] In study by Dipesh Gurubacharya et al the mean age of the study population was 38.34 years ± 9.64.[20] The highest numbers of cases i.e.52.6% were found in the age group between 30 to 40 years. Similar result obtain from- NHANES , Dionysus and Singh et al studies.[21-23] Large numbers of patients were in younger age group in most of studies because they were physically active and were more prone to accidental injury, sexual transmission exposure and exposure to blood/blood product.

Among 110 patients, 67 (60.90%) patients had identifiable risk factors for HCV transmission. In our study major risk factor was IUD, seen in 23 patients (20.91%), other source of infection of hepatitis C was history of previous surgery 18 (16.36%), History of blood transfusion 10 (9.09%) and 9 (8.18%) of history of unprotected sexual exposures. The mode of transmission was not identifiable in 39.09% of patients in this study population. A similar result was obtained from Gerlach et al and Wiegand et al studies.[24,25]

In our study commonest symptoms reported was abdominal discomfort (70.00%) followed by fatigue (62.72%), fever (60.90%), Jaundice (34.54%), dark urine (33.63%) etc .i.e 96 (87.27%) cases were symptomatic and 14 (12.72%) were asymptomatic. Joint pain, arthritis, pruritus are extrahepatic complication of hepatitis C. In a prospective study done by Villano S.A, et al.[26] HCV-infected subjects with a history of illicit drug use, subject's with viral clearance were more likely to have symptoms of jaundice. In another report of 200 patients with previously compensated cirrhosis, the most common forms of decomposition over the mean follow-up of 34 months were ascites (48.0%), gastrointestinal bleeding (32.5%), severe bacterial infection (14.5%), and encephalopathy (5%).[27]

Only 25%-30% of HCV patients with mixed cryoglobulinemia developed clinical symptoms, ranging from fatigue, skin rashes, purpura, arthralgias, Raynaud's phenomenon, vasculitis, renal disease, and peripheral neuropathies.[28]

In our study symptoms were reported more in younger age group (15-45 years) and especially more in male patients than female. In our study, 14 (12.72%) cases were asymptomatic and 20 (18.18%) cases had no clinical signs because they may have been chronic healthy carrier. The majority of the patients of age group 15-45 yrs were males. Consequently clinical signs were more prominent in this group.

The haematological profile of patients in our study showed severe anemia (Hb% <7gm%) in 20 (18.18%) cases .(may be due to recurrent blood loss by upper GI bleeding or Chronic liver disease), raised TLC >10000/cmm 8(7.27%), thrombocytopenia (platelet count < 1.5 lakhs) 17 (15.45%),Total bilirubin >2 mg% 67(60.90%), SGOT >40 IU/L 69 (62.72%), SGPT >40 IU/L 61 (55.45%).

Serum albumin <3.5gm% in 43 (39.09%) indicating chronic liver disease or hypoalbuminemia of another causes. Prothrombin time >18sec / coagulopathy in 27(24.54%), Serum creatinine>1.4mg% in 12(10.90%) (May be due to hepatotenal syndrome or renal failure due to shock.).

Severity of the liver disease was assesed by Child-Pugh classification, which is based on serum bilirubin, serum albumin, Prothrombin time, Ascites and Encephalopathy grade. If score >10 then greater severity of disease.

CONCLUSION

Viral hepatitis is an important heath care problem in India as it occurs epidemically and sporadically. The variability in nature of the disease regarding its onset, presenting symptoms, clinical course and development of complications are important aspects. So, it is very essential for health care professionals to be aware of all aspects of it so that it is detected and treated early.

Limitation

This study was hospital-based, as only patients who presented to the hospital were studied. Some of the patients with HCV-related liver diseases patronize traditional and spiritual healing homes, patent medicine vendor stores and private clinics closer to their homes.

The descriptive nature of the study was recognized by the researchers. However, this study stimulated the need for further detailed analytical and longitudinal studies in this area.

The sample size was relatively small, but this was more than the minimum estimated sample size for

the study and was the number of patients seen within the study period.

REFERENCES

1. Lavanchy D. The global burden of hepatitis C. Liver Int 2009; 29 Suppl 1: 74-81 [PMID: 19207969 DOI: 10.1111/ j.1478-3231.2008.01934.x]
2. Mohd Hanafiah K, Groeger J, Flaxman AD, Wiersma ST. Global epidemiology of hepatitis C virus infection: new estimates of age-specific antibody to HCVseroprevalence. Hepatology 2013; 57: 1333-1342 [PMID: 23172780 DOI: 10.1002/ hep.26141]
3. Lavanchy D. Evolving epidemiology of hepatitis C virus. Clin Microbiol Infect. 2011; 17:107-115
4. Averhoff FM, Glass N, Holtzman D. Global burden of hepatitis C: considerations for healthcare providers in the United States. Clin Infect Dis 2012; 55 Suppl 1: S10-S15 [PMID: 22715208]
5. Zaltron S, Spinetti A, Biasi L, Baiguera C, Castelli F. Chronic HCV infection: epidemiological and clinical relevance. BMC Infect Dis 2012; 12 Suppl 2: S2 [PMID: 23173556 DOI: 10.1186 /1471-2334-12-S2-S2]
6. Choo QL, Kuo G, Weiner AJ, Overby LR, Bradley DW, Houghton M. Isolation of a cDNA clone derived from a blood-borne non-A, non-B viral hepatitis genome. Science 1989; 244: 359-362 [PMID: 2523562 DOI: 10.1126/science.2523562]
7. Perz JF, Armstrong GL, Farrington LA, Hutin YJ, Bell BP. The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide. Journal of hepatology. Oct 2006;45(4):529-538.
8. European Association for the Study of the Liver. EASL Clinical Practice Guidelines: management of hepatitis C virus infection. J Hepatol 2011; 55: 245-264 [PMID: 21371579 DOI: 10.1016/j.jhep.2011.02.023]
9. van de Laar TJ, Matthews GV, Prins M, Danta M. Acute hepatitis C in HIV-infected men who have sex with men: an emerging sexually transmitted infection. AIDS 2010; 24: 1799-1812 [PMID: 20601854 DOI: 10.1097/ QAD.0b013e32833c11a5]
10. Esmat G, Hashem M, El-Raziky M, El-Akel W, El-Naghy S, El-Koofy N, El-Sayed R, Ahmed R, Atta-Allah M, Hamid MA, El-Kamary SS, El-Karaksy H. Risk factors for hepatitis C virus acquisition and predictors of persistence among Egyptian children. Liver Int 2012; 32: 449-456 [PMID: 22098096]
11. Okwen MP, Ngem BY, Alomba FA, Capo MV, Reid SR, Ewang EC. Uncovering high rates of unsafe injection equipment reuse in rural Cameroon: validation of a survey instrument that probes for specific misconceptions. Harm Reduct J 2011; 8: 4 [PMID: 21299899 DOI: 10.1186/1477-7517-8-4]
12. Hashem M, El-Karaksy H, Shata MT, Sobhy M, Helmy H, ElNaghi S, Galal G, Ali ZZ, Esmat G, Abdelwahab SF, Strickland GT, El-Kamary SS. Strong hepatitis C virus (HCV)specific siblings of HCV chronically infected children. J Infect Dis 2011; 203: 854-861 [PMID: 21257736 DOI: 10.1093/infdis/jiq123]
13. Hoofnagle JH et al. Course and outcome of hepatitis C. Hepatology. 2002 Nov; 36(5 Suppl 1):S21-9. (PMID: 12407573 DOI:10.1053/jhep.2002.36227)
14. Thomas D L and Seeff L B , Natural History of Hepatitis C Clinics in Liver Disease, August 2005, Volume 9, Issue 3, pp. 383-398
15. Fattovich G, Stroffolini T, Zagni I, Donato F. Hepatocellular carcinoma in cirrhosis: incidence and risk factors. Gastroenterology. 2004 Nov;127 (5 Suppl 1):S35-50.
16. Fattovich G et al, Morbidity and mortality in compensated cirrhosis type C: a retrospective follow-up study of 384 patients. Gastroenterology. 1997 Feb;112 (2):463-72.
17. Hu KQ, Tong MJ. The long-term outcomes of patients with compensated hepatitis C virus-related cirrhosis and history of parenteral exposure in the United States. Hepatology. 1999 Apr;29(4):1311-6.
18. Kleiner DE. The liver biopsy in chronic hepatitis C: a view from the other side of the microscope. Semin Liver Dis. 2005; 25(1):52–64. [PubMed: 15731997]
19. Mahajan P*, Manjit Singh, Garg A, Garg PD and Gurpreet Singh Prevalence of Hepatitis-C Viral Infection among Opioid Dependent Injectable Drug Users: A Study Conducted at Swami Vivekananda Drug De-Addiction and Treatment Centre, Amritsar. Dual Diagn Open Acc 1:26. (2016) doi: 10.21767/2472-5048.100006
20. Dipesh Gurubacharya, clinical, biochemical and virological profile of patients with chronic hepatitis c virus infection journal of Nobel College of medicine vol 4(1) 2015:32:35)
21. Alter M.J, et al. The prevalence of hepatitis C virus infection in the United States, 1988 through 1994. N Engl J Med, 1999. 341(8): 556-62.
22. Bellentani S and Tiribelli C. The spectrum of liver disease in thegeneral population: lesson from the Dionysos study. J Hepatol, 2001.35(4): 531-7.
23. Singh P, Kaur R, Kaur A. Frequency distribution of hepatitis C virus in different geographical regions of Punjab: retrospective study from a tertiary care centre in North India. J Nat Sci Biol Med. 2014; 5(1):56–58.)
24. Gerlach JT, DiepolderHM, ZachovalR, et al. Acute hepatitis C: High rate of both spontaneous and treatment-induced viral clearance. Gastroenterology 2003; 125:80–8.
25. Wiegand J, Buggisch P, Boecher W, et al. Early monotherapy with pegylated interferon alpha-2b for acute hepatitis infection: The HEP-NET acute-HCV-II study. Hepatology 2006; 43:250–6.
26. S.A. Villano, D. Vlahov, K.F. Nelson, S. Cohn, D.L. Thomas Persistence of viremia and the importance of long term follow-up after acute hepatitis C infection Hepatology, 29 (1999), pp. 908-914
27. Planas R, Balleste B, Alvarez MA, et al. Natural history of decompensated hepatitis C virus-related cirrhosis. A study of 200 patients. J hepatol. 2004; 40(5):823–830. [PubMed: 15094231]
28. Cacoub P, et al. Extrahepatic manifestations associated with hepatitis C virus infection. A prospective multicenter study of 321 patients. The GERMIVIC. Groupe d'Etude ET de Recherche en Medecine Interne ET Maladies Infectieuses sur le Virus de l'Hepatite C. Medicine (Baltimore), 2000. 79(1): 47-56-14.

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