Seroprevalence of HBsAg, Anti-HCV and Co-infection among Liver Disease Patients: A Prospective Observational Trial

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ABSTRACT

Introduction: The blood borne pathogens which are of considerable public health concern are HBV (Hepatitis B virus), HCV (Hepatitis C virus) and Co-infection. The mechanism of transmission for these are similar but the risk is much higher for HBV and HCV due to high prevalence of their carrier and high infectivity stages. Study aimed to detect the prevalence of HbsAg, anti HCV and Co infetion in liver disease patients and to analysis the risk factors associated with liver disease patients.

Material and Methods: The study included patients of all age groups, visiting OPDs or admitted to the wards of Medicine, who were diagnosed as patients of liver disorders from 1st April 2014 to 30th Sept 2015 in AIMSR, Bathinda.

Results: Out of 100 cases studied, 70 (70%) patients were males and 30 (30%) patients were females and almost 58 patients had history of single whereas 30 patients had history of multiple risk factors like treatment from quacks, alcohol addiction, exposure to blood transfusion, history of dental procedures, history of previous surgical procedure, history of tattooing done and visiting barbers respectively. And out of studied patients, 6 (100%) patients were HBsAg positive and 44 patients were anti HCV positive cases.

Conclusion: It is concluded from the present study that HBV and HCV are the major factors in the development of liver diseases with a prevalence of 6% and 44% respectively in patients with liver illnesses.

Keywords: HBsAg antigen, Anti-HCV, Seroprevalence, Risk factors, Hepalisa, Hepacard

INTRODUCTION

The world has entered into a new millennium but there is a growing burden of blood borne diseases particularly in the developing nations. The blood borne pathogens which are of considerable public health concern are HBV (Hepatitis B virus), HCV (Hepatitis C virus) and Co-infection.[1,2]

Hepatitis B: Etiological agent HBV belong to hepadenavirus family. Its incubation period is 60-90 days, most common in 15 – 29 yrs of age but it can infect any age group. This virus spreads through body fluids and parentral route i.e by transfusion of blood and blood products, from mother to fetus and by sexual route. The outcome of infection with HBV varies from complete recovery to progression to chronic hepatitis and rarely death from fulminant disease.[3,4]

DNA polymerase activity, HBV DNA, and HBe Ag which are representative of viremic stage of hepatitis B, occur early in incubation period along with HBsAg.[3-5]

Hepatitis C: HCV belongs to genus hepacivirus in family of flaviviridae. HCV causes acute hepatitis of which many progress to liver cirrhosis with increased risk of HCC. It spreads by direct contact with an infected person's blood i.e needle stick injuries, cuts with sharps, use of contaminated blood and sexual intercourse. It is prevalent throughout the world, with a prevalence as high as 10 % in certain populations in Africa.[6-8]

Co-Infection: The two hepatotropic viruses share same modes of transmission, coinfection with the two viruses is not uncommon, especially in areas with a high prevalence of HBV infection and among people at high risk for parenteral infection.[9,10]

Study aimed to detect the prevalence of HbsAg, anti HCV and Co infetion in liver disease patients and to analysis the risk factors associated with liver disease patients.

MATERIAL AND METHODS

After obtaining approval from the Institutional ethical committee and written informed consent, the present observational study was conducted in the Department of Microbiology in collaboration with Department of Medicine of AIMSR, Bathinda.

The study included a total of 100 patients of all age groups who were diagnosed as patients of liver disorders and either HCV positive or HBsAg positive or both, from 1st April 2014 to 30th Sept 2015 and who were just diagnosed as liver disease but no viral markers positive were excluded from the study in this period of study.

These patients either were visiting as OPD patients or admitted to the wards of Medicine, AIMSR, Bathinda. After taking detailed history of patient about the risk factors, sign and symptoms, complete investigation were done and noted in the performa.

After taking consent, 6ml of blood sample was taken under complete aseptic conditions. Then it was added to two EDTA vaccutainer (3ml each). One blood sample was tested in the department of Microbiology for viral markers and 2nd was tested for routine investigations and LFTs.

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Method

Test for Detection of HBsAg: Technique used-Hepacard for detection of HBsAg (J mitra and Co.kits).

1) HBV elisa test: Hepalisa a solid phase enzyme linked immunosorbent assay (ELISA) based on the "Direct Sandwich" principle.

2) HCV elisa test: The 3rd generation HCV Microlisa is based on a highly sensitive technique, Enzyme Linked Immunosorbent Assay which detects antibodies against HCV in human serum and plasma.

3) Biochemistry tests: Another half of the sample were sent to the biochemistry department for LFT and CBC and results were recorded in the proforma.

1. SGOT 2. SGPT
3. Alkaline phosphatase 4. Bilirubin levels
5. Sr. Proteins 6. Hb 7. TLC

(These tests had been done using the Erba kits).

STATISTICAL ANALYSIS

Microsoft Excel and Microsoft word (version 7) were use to generate the tables and figures. Results are based on descriptive statistics. The result was present on mean ± (S.D.) median (interquartile range) or number of patients as appropriate. For statistical comparision t test and chi-square tests were used and 'P' value < 0.05 was considered statistically significant

RESULTS

The following observations were made in the study of seroprevalence of hepatitis B surface antigen and anti- HCV antibodies in liver disease patients conducted in Department of Microbiology of Adesh hospital, Bathinda from 1st April 2014 to 30 September 2015. In our study, we took 100 liver disease patients and our findings were as following;

Demographic profile

a) Age Distribution: 55(55%) patients were in the age group of 41-60 years, 29 cases(29%) were in the age group of 21-40 years, while 16 cases (16%) were in the age group of 61-80 years. The age ranged from 20-80 years with mean age of 42.50 yrs.

b) Sex Distribution: 70 (70%) patients were males and 30 (30%) patients were females, with male to female ratio being 2.3:1.

c) Residence Distribution: 32(32%) patients were from urban areas and 68(68%) patients were from rural areas.

d) Occupation Distribution: 70(70%) cases were male patients and 30(30%) were female patients. Male patients were, farmers 42(60%), followed by drivers 12(17.14%), business men 11(15.7%), Govt /pvt. job holder 4(5.7%) and labourers 1(1.4%) respectively. Whereas, Female patients were house wives 25(83.33%), followed by 5(16.67%) patients were Govt/ Pvt. Job holders.

Risk Factors in Patients of Liver Diseases

12 patients had no history of risk factors. Whereas 58 patients had history of single risk factor exposure and 30 patients had multiple risk factor exposure

a) Single Risk Factors: Out of 58 patients, 46 were male patients and 12 were female patients. Whereas 7 patients had history of treatment from quacks, 33 had the history of alcohol addiction, 4 had history of exposure to blood transfusion and 5 had history of dental procedures, while 5 had history of previous surgical procedure,3 had tattooing done, while 1 had history of visiting barbers respectively.

b) Multiple Risk Factors: Out of 30 patients 18 were male patients and 12 were female patients. whereas 5 patients had history of treatment from quacks and blood transfusion, 5 patients had history of IV drug abuse and alcohol ingestion, 10 patients had history of treatment from quacks and alcohol ingestion, 4 patients had a historof blood transfusion and alcohol ingestion, while 4 had history of dental procedures and treatment from quacks, 2 had history of sexual exposure and alcohol consumption respectively.

HBsAg positivity in relation to Liver Diseases

6 (100%) patients were HBsAg positive. Out of these, 3(50%) patients were of viral hepatitis, 2(33.33%) patients were of alcoholic hepatitis and 1(18.18%) patient was of cirrhosis respectively (Table-1).

Anti-HCV positivity in relation to Liver Diseases

44 (100%) patients were anti HCV positive cases. Maximum positivity was seen in patients of cirrhosis of liver i.e. 22 (50%) patients were anti HCV positive, followed by patients of viral hepatitis 10 (22.72%), then patients of alcoholic liver disease 6 (13.63%) and 3 (6.81%) patients each of fatty liver and chronic liver disease (Table-1).

HBsAg positivity in relation to Various High Risk Factors

6 positive HBs Ag patients to various risk factors as exposure of patients to single risk factors or multiple risk factors as per their occupation and life style (Table-2).

Anti-HCV Positivity In Relation To Various High Risk Behavior

In Table-2, out of 100 liver disease patients, we showed the relation of 44 anti-HCV positive patients to various risk factors as exposure of patients to single risk factors or multiple risk factors as per their occupation and life style.

CO -Infection of HBV and HCV In Liver Disease

Out of total 100 patients, 48 patients were positive, 30 patients

Disease	No. of cases	HBsAg positivity	Percentage (x/6)(x=+case)	Anti HCV positivity	Percentage (x/44)
Fatty liver	5	0	0	3	6.81%
Viral hepatitis	25	3	50	10	22.72%
Alcoholic hepatitis	29	2	33.3	6	13.63%
Cirrhosis	33	1	18.18	22	50%
Chronic liver disease	8	0	0	3	6.81%
Total	100	6	100	44	100%

Table-1: HBsAg and Anti-HCV positivity in relation to Liver Diseases

Risk factor	Total Cases	M	F	Total HBsAg +ve cases	Total Anti-HCV+ve cases
No risk factor	12	6	6	0	0
IV drug user	0	0	0	0	0
IV drug user + Alcohol ingestion	5	5	0	1	4
Treat from Quacks	7	4	3	0	7
Treat from Quacks + Blood trans.	5	2	3	2	4
Treat from Quacks + Alcohol ingestion	10	5	5	1	4
Blood transfusion	4	1	3	0	3
Blood trans + Alcohol ingestion	4	4	0	0	2
Sexual trans + Alcohol ingestion	2	2	0	0	0
Alcohol ingestion	33	33	0	1	5
Dental extraction	5	0	5	1	5
Dental extraction + Treatment from Quacks	4	0	4	0	4
Surgical intervention	5	4	1	0	3
Tattooing	3	3	0	0	2
Barber	1	1	0	0	1
Total	100	70	30	6	44

Table-2: Various High Risk Behavior in relation to HBsAg and Anti –HCV postivite cases

were male and 18 patients were female. Whereas out of these 48 patients, 4 patients were only/exclusively HBsAg positive, 42 patients were only/exclusively anti-HCV positive and Co-infection was found in 2 cases, both were male patients.

DISCUSSION

Present study comprised of 100 patients of liver disease who attended OPD or were admitted in wards of department of Medicine in Adesh medical college, Bathinda, Punjab. The HBsAg and anti -HCV antibodies were tested in these patients.

In the present study (2015), out of 100 patients, the age ranged from 21-80 years with a mean±SD of 42.50±10.8 whereas Singh et al[16] from Chandigarh found that out of 100 patients the age ranged from 16-75 years with a mean ± SD of 46.5±16.46, Chakravarti et al[17] from Delhi found that out of 130 patients, the age ranged from 16-72 years with a Mean ± SD of 43.5±17 and Gill et al[20] from Patiala found that out of 100 patients, the age ranged from 12-75 years with a Mean ± SD of 41.15±16.46. The P value is ≥ 0.05 and insignificant.

We found that male to female ratio was 2.3:1, whereas Gill et al[20] in their study, done in patiala, found that male to female ratio was 1.9:1, Chakravarti et al[17] in their study, found that male to female ratio was 3.7:1, Singh et al[16] in Manipur, in their study, found that male to female ratio was 2.3:1 and Kumar et al[14] in their study, done in Aligarh, found that male to female ratio was 1.6:1.

In present study(2015),out of 100 patients, 68(68%) patients were from rural areas and 32(32%) patients were from urban areas, whereas Gill et al[20] reported that out of 100 patients, 54(54%) patients were from rural areas and 46 (46%) patients were from urban areas and Ayele et al[22] reported that out of 120 patients, 29(24.2%) patients were from rural areas and 91 (75.8%) patients were from urban areas

In the present study (2015), maximum male personnel were farmers, followed by driver, business men, govt./pvt. job holders and laborer, whereas female patients were housewives, whereas Gill et al[20] reported that majority of their study group male personnel were labourers, farmers, business men, govt/ pvt. job holders, students and health care worker, while in female patients, were housewives followed domestic helpers and student.

This study included 100 cases with liver disease comprising of 5 cases of Fatty liver, 25 cases of Viral hepatitis, 29 cases of Alcoholic hepatitis and 33 cases of Cirrhosis and 8 cases of Chronic liver disease whereas Devi et al[15], in their study, included 100 cases with liver disease comprising 30 cases of Viral hepatitis, 36 cases of Alcoholic hepatitis and 33 cases of Cirrhosis and Gill et al[20] found, in their study that out of 100 cases with liver disease comprising 27 cases of Viral hepatitis, 38 cases of Alcoholic hepatitis and 35 cases of Cirrhosis.

Out of 100 liver disease patients, 12 patients had no history of risk factors. Whereas 58 patients had history of single risk factor exposure and 30 patients had multiple risk factor exposure**.** Whereas**,** Singh et al[16] founded, Out of 100 patients, 30 patients had history of blood transfusion and 15 patients had history of alcohol ingestion, Devi et al[15], out of 100 cases of hepatic diseases, 34 patient had history of risk factors like blood transfusion, IV drug abuser (IDU) and multiple sexual contact etc. Gill et al[20] founded that out of 100 cases of liver disease, 28 had history of risk factors. like blood transfusion, drug addicts, needle prick, perinatel transmission and history of sexual contact. So, Devi et al[15], Singh et al[16] and Gil et al[20] all studied 100 cases of liver diseases, but in their maximum patients, the common mode of transmission was by blood transfusion followed by IV drug abusers but in present study maximum cases had history of alcohol consumption (47) followed by treatment from quacks (26), so the difference in study was may be due to difference in the type of patients under study.

In the present study, out of 100 liver disease patients, 6 patients were HBsAg positive. Out of 100 liver disease patients, 6 patients were HBsAg positive, so prevalence was 6%. The results of the present study in regards to HBsAg prevelance were comparable to study of Mathur et al[12] who had prevalence 5.9% and Singh et al[16] had 4%. While Gill et al[20], Ayele et al[22] and Sharma et al[23] reported higher prevalence of HBsAg i.e 18%, 35.8% and 36.3% respectively. It may be due to higher prevalence of HBsAg in those areas.

In our study, we found multiple risk factors like IV drug abusers + alcohol consumption, blood transfusion + treatment from quacks, blood transfusion+ alcohol consumption and dental procedures+ treatment from quacks were the major risk factors.

In the present study, Out of 100 liver disease cases, 44(44%)

Author	Year of Study	Place	IV drugs	Blood Trans.	Treat. Quacks	Sexual Trans.	Dental / tatto	Sx Inv./ Nedl Prick	Multi Risk factor
Arora et al[19]	2007	Amritsar	3.5%	7.14%	-	3.57%	-	7.14%	17.8%
Gill et al[20]	2009	Patiala	16.6%	5.5%	-	5.5%	-	5.5%	
Saravanan et al[21]	2009	chennai	23.2%	-	26.7%	8.9%	37.5%		61.6%
Sharma et al[23]	2014	Farrukha bad	1.8%	6.4%	-	5.5%	9.1%	50%	-
Present study	2015	Bathinda	-	-	-	16.6%	16.6%	-	66.6%

Table-3: HBsAg positivity in relation to High risk factors

Auth.	Yrs.	Place	IV Drug Addict %	Blood Trans. %	Treat From Quacks %	Alcohol Addict %	Dental/ tattoo/ Barber %	Sexual Trans.%	Sx Inv/ Ndl. Stick%	Multi Risk Fac-tors%
Sood et al[13]	2002	ludhiana	-	18.2	-	15.5	20	-	16.7	
Arora et al[19]	2007	Amritsar	7.7	-	-	-	-	7.7	15.35	46.15
Gill et al[20]	2009	Patiala	17.4	13.2	-	-	-	-	4.4	-
Saravanan et al[21]	2009	Chennai	19.4	-	25.3	-	43.3	10.4	-	64.1
Sharma et al[23]	2014	Farrukhabad	8.4	8.3	-	-	8.3	8.3	42	-
Pr.study	2015	Bathinda	-	6.9	18.4	11.5	18.4	-	6.9	46

Table-4: Anti-HCV positivity in relation to high risk behaviour

patients were anti HCV positive cases. Whereas Devi et al[15] had 30%, Singh et al[16] found 48%, Seyad et al[18] found 40.7%, Saravanan et al[21] found 43% and Gill et al[20] found 23% anti-HCV positive cases (Tables-3,4).

In the present study, out of total 100 patients, Co-infection were found in 2 cases, both were male patients. Whereas, Devi et al[15] found HCV positivity around 5%, Singh et al[16] found 5%, Gill et al[20] found 3%, Saravanan et al[21] found 5.9% and Sharma et al[23] found 0.33%.

Limitations of the study

This is a basically a prospective observational study, with a relatively smaller sample size. So some biases and pitfalls may have been left while designing and executing the study trial

CONCLUSION

In the present study that HBV and HCV are the major factors in the development of liver diseases with a prevalence of 6% and 44% respectively in patients with liver illnesses. Maximum liver disease patients being in age group 41-60. Whereas, 2% of patients had Co-infection with HBV and HCV, which can be attributed to low prevalence of HBV as well as to the prevalence of occult HBV in HCV infected patients. HCV infection appears to have a suppressive effect on the replication of HBV which could be another reason for low HBV prevalence and co-infection.

The major risk factors associated were found to be alcohol consumption and treatment from quacks and blood transfusion. So alcohol consumption could be an aggravating factor for causing impaired liver functions in addition to HBV and HCV. The transmission of HCV could be curtailed by the awareness of the general public about his mode of transmission.

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