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Study of Clinicoserological Profile in Hepatitis B Infection.

Medical Science

KEYWORDS : Hepatitis B infection, Clinicoserological correlation,Biochemical parameters.

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ABSTRACT

Introduction: Hepatitis B Virus is probably the most important chronic viral infection affecting Indians. The present study was conducted to study clinicoserological correlation & biochemical parameters with various stages of hepatitis B infection, along with epidemiological pattern & various complications in hepatitis B infection.Methods The study was carried out at the Microbiology Department, N.H.L. Municipal Medical Collage, Ahmedabad, during the period November 2009 to November 2011.A total 100 cases of HBsAg reactive patients were studied. The blood samples from these patients were tested for antiHepatitisB c IgM, anti HBc total and/or HBeAg and clinical history with investigations were obtained simultaneously.
Results and Observations. The maximum anti HBc IgM positive cases were in age group of 31-45 years. In cases with non-reactive anti HBc IgM, SGPT & S. bilirubin were found statistically significantly raised in cases with HBeAg reactive than in cases with HBeAg non-reactive.

Introduction:
Despite the development of an effective vaccine against HBV, this infection remains a serious threat to public health in India.1 HBV reported to be responsible for 70% of cases of chronic hepatitis and 80% of cases of cirrhosis of liver.About 60% of patients with hepatocellular carcinoma are HBV marker positive.3 HBV infection is a global public health problem.It is estimated there are more than 350 million HBV carriers in the world, of whom roughly one million die annually from HBV related liver disease.2The spectrum of clinical manifestations of HBV infection varies in both acute and chronic disease.Extrahepatic manifestations also can occur with both acute and chronic infection.4The aim of this study was 1) to study clinicoserological correlation in acute & chronic infection of hepatitis B,2)to study epidemiological pattern , various complications in hepatitis B infection 3) biochemical parameters with various stages of hepatitis B infection.

Material & method:
The study was carried out at the Microbiology Department, N.H.L. Municipal Medical Collage, Ahmedabad, during the period November 2009 to November 2011.A total 100 cases of HBsAg reactive patients were studied. The blood samples from these patients were tested for anti HBc IgM, anti HBc total and/or HBeAg .For every case, clinical history with relevant examination & investigations were obtained & written in preformed proforma.

The Anti HBc Total & Anti HBc IgM tests were based on the principle of Micro particle Enzyme Immunoassay, with the kits named Abbott AXSYM SYSTEM CORE & Abbott AXSYM SYSTEM CORE-M respectively .The HBeAg test was based on the principle of Rapid Immunochromatography with the kit named Insight DEVICE.

Result
The total 100 cases were studied.

Among the total 42 anti HBc IgM Positive cases, male were 27(64%) & Female were 15(36%).Among the total 58 anti HBc IgM Negative & anti HBc total Positive cases male were 39(67%) & Female were 19(33%).Thus, cases presented with acute & chronic hepatitis B show male preponderance with Male: Female ratio was 1.8:1 & 2:1 respectively. The relationship between gender and anti HBc IgM status was found statistically not significant. (p>0.05).

Among the total 34 anti HBc IgM positive cases studied for HBeAg, 11(31%) were found positive for HBeAg, while among the total 48 anti HBc IgM Negative & anti HBc total Positive cases studied for HBeAg 8(17%) were found positive for HBeAg. The relationship between HBeAg status and anti HBcIgM status was found statistically not significant. (p>0.05)

Table No.1:Age groupwise distribution of anti HBcIgM positive patients

Age group(years)	Total anti HBcIgM Positive patients	anti HBcIgM Positive patients in percentage
0-15	2	5%
16-30	8	19%
31-45	15	36%
46-60	9	21%
>60	8	19%

Table No.1 shows the maximum (36%) anti HBcIgM positive cases were in age group of 31-45 years, followed by 46-60 years & least were in below 15 years.

Table No. 2 :Billirubin level in anti HBc IgM positive cases

Billirubin level in blood(mg/dl)	Anti HBcIgM positive cases	%		Anti HBcIgM negative & anti HBc total positive cases	%
0.2-1.2 (normal range	3	7%		35	70%
1.2-5	9	21%	62%	8	16%
5-10	10	24%		1	2%
10-15	7	17%		1	2%
15-20	6	14%	31%	2	4%
>20	7	17%		3	6%
Totalcases studied	42			50	

Table No.2 shows, among the cases presented with acute hepatitis B infection (anti HBc IgM positive) with raised bilirubin level, bilirubin was found above 15mg/dl in 13(31%) cases: while in 3(7%) cases bilirubin level was found normal. Among the patients presented with chronic hepatitis B infection (anti HBc IgM negative & anti HBc total positive), bilirubin level were found normal in maximum cases(70%).

Table No. 3: Comparison of SGPT level

SGPT	Anti HBc IgM positive cases	Anti HBc IgM negative & Anti HBc total positive cases
Cases within normal range (0-55 U/L)	5 (12%)	37(71%)
>500 U/L	28 (68%)	8 (15%)
>1000 U/L	16 (39%)	5 (10%)

Table No. 4: Radiological changes in liver

	Anti HBc IgM positive cases	Anti HBc IgM negative & Anti HBc total positive cases
Cirrhosis	3(7%)	7 (12%)male-5,Female-2
Fatty changes	2(5%)	0
Fulminant Hepatic failure	1(2%)	0
?Liver Carcinoma? cirrhosis	1	0
Hemangioma	0	2
Few cysts	0	1

Out of 7 anti HBc IgM Negative cases with cirrhosis, 5 were found HBeAg negative suggest importance of HBV DNA test for detection of viral load.

Among the Anti HBcIgM positive cases, cases found with splenomegaly- 2 (5%),Hepatic encephalopathy -2(5%).

Among the Anti HBc IgM negative &Anti HBc total positive cases, cases found with spleeenomegaly- 8 (14%),Hepatic encephalopathy -1(2%), ascites-8(14%).

Among the Anti HBcIgM positive cases, 5(12%) were having the past history of blood transfusion,while Among the Anti HBc IgM negative &Anti HBc total positive cases, 6 (10%) were having the past history of blood transfusion.

Table No. 5: biochemical parameters

Tests	Normal range	Anti HBc IgM positive cases			Anti HBc IgM negative & Anti HBc total positive cases		
		Total cases observed	No. of cases beyond normal range	Cases beyond normal range in percentage	Total cases observed	No. of cases beyond normal range	Cases beyond normal range in percentage
S.Alkaline Phosphatase	Child-<500 Adult 50-150U/L	39	18	46%	50	11	22%
S. Total Protein	6.6-8.7 gm/dl	23	13	57%	25	14	56%
A : G ratio	1.3-1.7	22	14	64%	23	15	65%

Table No. 6: Comparison of biochemical parameters with the status of HBeAg & Anti HBc IgM

HBeAg	Anti HBcIgM	Anti HBc total (IgM+IgG)	Percentage of cases beyond normal range				
			SGPT	S. ALP	S.billirubin	S.protein	A:G ratio
NR	NR	R	25.0%	20.6%	23.5%	52.9%	68.7%
R	NR	R	42.9%	14.3%	42.9%	33.3%	33.3%
R	R	R	100%	50%	100%	66.7%	33.3%

NR-Non-reactive, R-Reactive

In cases with non-reactive anti HBc IgM, SGPT,S.billirubin were found statistically significantly raised in cases with HBeAg reactive than in cases with HBeAg non-reactive($p<0.01$).

S.ALP was found to be not statistically significantly associated with HBeAg status in cases with non-reactive anti HBc IgM. ($p>0.05$)

Discussion

In present study anti HBc IgM positive & anti HBc IgM negative cases are considered to be having acute & chronic infection respectively, for the interpretation of data. However, index value of anti-HBc IgM may increase to levels usually detectable in acute infection in 10-20% of chronic hepatitis B patients with acute exacerbation or hepatitis flare that often leads to a misdiagnosis of acute hepatitis B. So, some trivial variation may exist in actual observation.

In present study among the total anti HBc IgM positive cases, Male: Female Ratio was 1.8 :1,while study done by Brayn J. et al (done in America)[5] & Maria Lucia Gomes Ferraz et al(done in Brazil)[6] shows Male: Female Ratio 2.6 : 1& 1.3 : 1 respectively. Most study have shown a sex ratio of 1.3: 1 to 2: 1[7, 8].Thus difference exist in different studies in different geographic areas.

Comparative study of age group in acute hepatitis B infection

In present study highest incidence of anti HBc IgM positive cases present in age group between 31-45 years(36%), which correlates with study done by Bryan J. et al(done in America)[5] which shows highest incidence rate in those between 35 to 44 years ,while in Germany, the peak incidence is found in males aged between 20-29 years pointing to i.v. drug use and male homosexuality as major risk factors.[9] Another study done by Maria Lucia Gomes Ferraz et al (done in Brazil)[6] shows most patients with acute hepatitis B infection were in the age group between 20 to 40 years.

Study done by Brayn J. et al (done in America)[5] shows 82% cases of acute hepatitis B were between 15-44 years of age, while in present study only 55% cases of acute hepatitis B were between 16-45 years of age. Thus, difference exists in different studies in different geographic areas. In most cases, the peak incidence of the disease occurs among adolescents & young adults.[8]

Prevalence of anti-HBc, the best marker for current or previous infection, is highly variable in different geographic regions, ethnic or behavioral groups. There are no hints that certain races are most susceptible to persistent infection. There may be very large differences within a country. In areas of low or moderate endemicity, prevalence increases gradually with age, being very low during childhood. In areas of high prevalence, most individuals have acquired the infection before school age.[9]

Comparative study of SGPT

In present study 68% of the anti HBcIgM positive cases shows SGPT>500 IU/L, which correlates with what is said in literature.[9] In present study 71% of the anti HBc IgM negative cases shows SGPT within normal range which correlates with study done by Chowdhury A. et al in West Bengal,India,[11] which shows most (78%) had normal levels & only 22% had elevated levels.

Literature suggest 0.2% of clinically apparent cases of acute hepatitis B are turn in to fulminant hepatic fail*ure.[9] In our study* 1(2%) cases of fulminant hepatic failure was noted.

Splenomegaly was found in 5% antiHBc IgM cases ,which correlates with literature.(5% written in British Medical Journal,SD Ryder et al.)[10]

Role of HBeAg test in case of chronic hepatitis B

Out of seven anti HBc IgM negative cases with cirrrhosis, five were HBeAg negative ,that suggests importance of a quantitative HBV DNA assay for detection of viral load.

A typical feature of late phase chronic hepatitis B virus infection is the selection of variants with deletions or mutations leading to an altered expression of hepatitis B virus or to altered gene products. Most frequent are mutations that abolish expression of HBeAg. Therefore, absence of HBeAg suggests low viremia ($<10^6$ hepatitis B virus particles/ml) but does not exclude higher levels. Positive HBeAg suggests high viremia (10^8 hepatitis B virus particles/ml). A quantitative HBV DNA assay is therefore recommended.[9]

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