

Seropositivity and pattern of viral hepatitis in clinically suspected cases of hepatitis in Dhaka city

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Abstract

An attempt was made to see the seropositivity and pattern of four common hepatotropic viruses (HBV, HCV, HEV, HAV) in patients suspected to have been suffering from viral hepatitis. Blood samples from 2,995 cases of suspected HBV infection, 331 from HCV, 155 from HEV and 24 from HAV were tested for these viral markers. Of these a total of 245 (8.1%) were positive for HBsAg, 18 (5.4%) for HCV, 87 (56.1%) for HEV and 8 (33.3%) were positive for HAV infection. The predominant age group affected in HBV is 25-40 years, for HCV >61 years, HEV 26-50 years and HAV under 11 years. Seropositivity for HBsAg was statistically higher (near double) in males than females ($p < 0.05$). HCV showed more seropositivity in males than females. HEV showed slight male preponderance and for HAV the female showed preponderance. The seropositivity rate was higher in Bangladesh in comparison to other developed and developing countries.

Introduction

Viral hepatitis a major public health problem globally, Bangladesh is no exception. The hepatotropic viruses are the most important cause of viral hepatitis and can cause hepatocellular injury ranging from subclinical inflammation to hepatic failure, cirrhosis, cancer and death apart from other causes like excessive alcohol consumption, use of certain hepatotoxic drugs and other types of infectious and nutritional agents. Among the most important hepatotropic viruses, hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis A virus (HAV) and hepatitis E virus (HEV) are commonly prevalent in the world and also in Bangladesh. Overall HAV accounts for 25% of clinically evident acute hepatitis worldwide, HBV has infected over 2 billion people worldwide with a carrier of 350 million¹⁻³. HEV accounts for about 50% of cases of sporadic acute hepatitis in India and epidemics have also been reported in Indian subcontinent, sub-Saharan Africa and Mexico⁴⁻⁶. The global prevalence varies from high >8% in Africa, Asia, Western Pacific region, intermediate 2-7% in South Eastern Europe and low <2.5 in Western Europe, North America and Australia. Prevalence of HCV is 1.8% in general population in USA, increasing up to 50% in

unexplained cirrhosis and hepatocellular carcinoma (HCC) and is the most common cause of chronic liver disease⁴⁻⁶.

The exact prevalence of hepatitis viruses varies from country to country and no exact data is available in Bangladesh. However some isolated studies on general population showed prevalence of 8.0% and different subpopulation like heterosexuals with multiple partners the prevalence was high 19.0%⁷⁻⁹. As the exact prevalence of hepatitis viruses are not known in Bangladesh, the present study was undertaken to determine the seropositivity of HBV, HCV, HEV, HAV in patients suspected clinically of having these infections. This will throw some light on the seropositivity of various types of hepatitis in Bangladesh and will try to help to define better preventive and curative measures.

Materials and Methods

Between March 2003 to September 2005 a total of 2995 patients suspected to have been suffering from HBV infection, 331 cases of suspected HCV, 156 cases of suspected HEV and 24 cases of suspected HAV infection based on clinical examination and history seen by clinicians at

different centers of Bangladesh Institute of Health Science at Dhaka were included in this study. Clinically suspected patient means the patients have clinical symptoms like anorexia, nausea, vomiting, diarrhea, itching, yellow discoloration of skin and mucous membrane, high colored urine, pale stool, past history of blood transfusion, unsafe sex, sharing of needles, razors etc. In all these patients 5 ml of blood were taken aseptically and sent to Immunology department of Bangladesh Institute of Health Sciences central laboratory at Mirpur for testing. Sera were subjected to Enzyme Linked Immunoabsorbant Assay (ELISA). HBsAg, anti-HAV IgM were assessed using commercially available ELISA kits from Diasorin, Italy, anti-HCV IgM antibodies were detected by kits from MBS (Medical Biological Services, Italy). Positive samples of HBsAg, anti-HCV, anti-HEV, anti-HAV were reconfirmed by repeat ELISA (Organon Technica, Netherlands).

Results

A total of 245 (8.1%) out of 2,995 cases of suspected HBV infection were found positive for HBsAg. The seropositivity was higher in males n=167 (68.2%), almost double than females n=78 (31.8%) which was statistically significant ($p<0.05$). Most of the positive cases were between 25-40 years of age group. The mean age \pm SE of the patient was 39.3 ± 0.2 years.

Among the total 331 cases of suspected HCV and tested for anti-HCV IgM 18 (5.4%) came out as positive. The seropositivity is higher in males n=10 (55.5%) than females n=8 (45.5%). The predominant positive age group was 40-70 years n=17 (94.4%), n=1 (5.6%) was under 40 years.

Among 155 suspected cases of HEV infection 87 (56.1%) showed seropositivity. The predominant age group of positive cases was 26-50 years n=43 (49.4%), 23 belong to age group 51-70 years n=23 (26.4%) with slight male preponderance, male n=46 (52.9%) and female n=41 (47.1%). The mean age \pm SE of the patient was 38.2 ± 1.3 years.

Out of total suspected cases of HAV infection, n=8 (33.3%) were anti-HAV IgM positive. 6 (75%) were under 17 years of age and a slight female preponderance was seen in HAV seropositive cases, female n=5 (62.5%) and male n=3 (37.5%). Seropositivity for anti-HAV, HEV IgM indicates suggestive of recent infection. Moreover we noticed an increase of HEV infection in rainy season (June to August) data not shown. Cumulative results are shown in Table I and II.

Table I: Status of hepatitis patients grouping of age cross distribution

Status of hepatitis patients	Grouping of age total				Total
	0-25 years	26-50 years	51-75 years	>75 years	
HBsAg -ve	525	1601	601	23	2750
HBsAg +ve	53	142	46	4	245
HAV -ve	4	7	5	0	16
HAV +ve	6	2	0	0	8
HCV -ve	28	184	99	2	313
HCV +ve	1	9	8	0	18
HEV -ve	20	32	15	1	68
HEV +ve	21	23	43	0	87
Total	658	2000	817	30	3505

Table II: Status of hepatitis pattern sex of the patient cross tabulation

Status of hepatitis patients	Sex of the patient		Total
	Male	Female	
HBsAg -ve	1322	1428	2750
HBsAg +ve	167	78	245
HAV -ve	8	8	16
HAV +ve	3	5	8
HCV -ve	193	120	313
HCV +ve	10	8	18
HEV -ve	38	30	68
HEV +ve	46	41	87
Total	1787	1718	3505

Discussion

The present study indicates a higher seropositivity of HAV, HEV, HBV, HCV in patients suspected of suffering from viral hepatitis due to these hepatotropic viruses in Bangladesh. It does not reflect the exact prevalence of hepatotropic viral hepatitis in Bangladesh but this probably reflects the current situation related to viral hepatitis in Bangladesh. The seropositivity of HAV and HEV are quite high and alarming in Bangladesh as evident from this study. It is well known that these two viruses cause infections in crowded residential areas and spread by feco-oral route. One important issue as evident from this study is very high seropositivity of HAV (75%) infection in young adults predominantly under 17 years of age. This indicates that HAV infection is acquired in early years of life. The younger population takes food and drinks from different fast food restaurants,

open hotels, restaurants in crowded, slum areas where the hygiene is not properly maintained. Also surface water of rivers and lake may be contaminated with HAV and may act as a source of HAV infection¹⁰. This is corroborative with other studies in India and Pakistan where they found that about 60% and 85% children acquired HAV infection mainly through sub clinical infection.

The higher seropositivity of HEV infection among adults (56.1%) compared to children and young adults is also similar to that of research work published on population based studies and in India¹¹, Pakistan⁹, Hong Kong¹² and Somalia¹⁰. It is not well known why this infection is common in adults, however one probable explanation is that the adults consumes more food, exposed to different food and drinks in comparison to children. This leads the adults more vulnerable to this infection through contaminated food and water. Added factors may include rainy season, flood, contaminated water supply but extensive studies are needed involving larger population from different geographical areas from different countries to establish these factors.

Although hepatitis B vaccine is available 25 years back still majority of the population of Bangladesh can not afford to buy this vaccine and take it because of its high price. More over unsafe use of blood and blood products, sharing of needles, unsafe sex and lack of proper knowledge regarding hepatitis B is prevailing in Bangladesh. This is well reflected by the high seropositivity of HBsAg (8.1%) in suspected cases of HBV infection. There is statistical significant difference in HBsAg seropositivity between male and female ($p < 0.05$). Also the mean age of HBsAg patients is 39.7 years which reflects the active part of life and suffering from this dreadly disease means reduced activity, more economic and social burden for the patient and his family. Our seropositivity is less than that of Pakistan⁹ and Kenya¹³ where the seropositivity found is 10% and 26.2% respectively. The prevalence is also higher in Italy where the prevalence of HBsAg is 13.4%¹⁴.

HCV transmits via unscreened blood, shared needles, hemodialysis and unsafe sex. These are also same for Bangladesh and the HCV seropositivity in the present study is 5.4%. The mean age of the seropositive cases is 44.9 years also indicating active part of life and like HBV it is also true that this positivity will create reduction in activity, induce economic and social burden for the patient and his family. This seropositivity for HCV is less than that of Pakistan⁹, Kenya¹³, Thailand¹⁵ and same in Italy¹⁴ where the prevalence of HCV is

6%, 7.1%, 7.8% and 5.7% respectively. This difference may be due to small sample number, not done in general population. Another survey in a small Mediterranean town¹⁶ showed the prevalence of HCV is 4.5% high in individuals over the age of 50. This is consistent with the present study where the mean age is around 45 years.

In conclusion, the present study indicates high seropositivity of hepatotropic viruses like HAV (33.3%), HEV (55.7%), HBV (8.1%), HCV (5.4%) in patients suspected to have suffering from hepatitis in Bangladesh. Seropositivity of HBV and HCV were more in the active period of life (the mean age of 39.7 years and 44.9 years respectively) and HBV positivity was significantly higher in females than males. Urgent and strict preventive measures mentioned are needed to combat this menace.

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Authors contribution

MTR: Preparation of the manuscript
RS: Performing the hepatitis panel tests
SRC: Compilation and analysis of data

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