SEROPREVALENCE OF HEPATITIS B IN OUTDOOR FEMALE PATIENTS OF REPRODUCTIVE AGE GROUP AT AYUB TEACHING HOSPITAL ABBOTTABAD

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Background: Hepatitis B is inflammation of the liver caused by a Hepatitis B virus, having a parenteral mode of entry and infecting millions of people around the world. **Objective:** The present study was planned to assess the seroprevalence of Hepatitis B in women of reproductive age in Hazara in order to promote disease prevention in the perinatal period by vaccination against Hepatitis B. **Subjects and Methods:** Women 15–45 years old belonging to Hazara Division were included in this descriptive, cross-sectional study conducted over a period of one year at the Department of Microbiology, Ayub Medical College, Abbottabad in collaboration with the Department of Pathology, Ayub Teaching Hospital, Abbottabad from 1st March 2006 to 28th February 2007. Non-probability convenience sampling was done to select 500 females from those visiting Ayub Teaching Hospital Abbottabad as outdoor patients or accompanying person. History, examination, and serum alanine aminotransferase estimation were followed by the initial screening for Hepatitis B surface Antigen (HBsAg) using immunochromatographic device. Enzyme linked Immunosorbent assay was used to confirm the presence of HBsAg. **Results:** HBsAg was detected in 3% of the women. History of multiple injections was present in 100%, blood transfusion in 22%, dental procedure in 46% and surgical procedure in 43% of the subjects. Only 1% women had been vaccinated. **Conclusion:** Seroprevalence of the Hepatitis B is not different from the figures reported by the studies previously conducted on general population in Pakistan. However it is different from those reported for the special groups.

Keywords. Hepatitis B, Viral Hepatitis, Chronic liver disease, HBsAg, immunochromatographic device, ELISA

INTRODUCTION

Hepatitis is inflammation of the liver. Viral infection is one cause of hepatitis. Common viruses causing hepatitis in man include hepatitis A, B, C, D and E viruses. Hepatitis B Virus (HBV), which is a Deoxyribonucleic Acid (DNA) virus, is the cause of hepatitis B. Its mode of transmission is parenteral. Sexual mode of transmission is also known.[1] Mother to child transmission during perinatal period has also been reported and preventive measures are recommended during this period.[2] Eight genotypes of Hepatitis B virus have been found till now, they are named A to H.[3,4] All of them can cause infection in humans.

HBV infection is a global health problem and has been the subject of several studies previously conducted in Pakistan including Hazara division. According to an estimate, 350 million population worldwide is chronically infected with HBV.[5] The prevalence of Hepatitis B Virus varies from region to region and ranges from 1 to 20 percent in different parts of the world.

Varying prevalence rates of Hepatitis B have been reported from different parts of Pakistan.[6–9] The incubation period of infection is from 50 to 180 days. It can survive outside the body for long periods.[10] Hepatitis B virus infection can cause several disease conditions which may be clinically evident or silent. These include acute hepatitis, chronic hepatitis B, inactive HBsAg carrier state, resolved hepatitis B, Acute exacerbation or flare of hepatitis B, reactivation of hepatitis B, cirrhosis of liver and hepatocellular carcinoma.

The present study aimed at determining the prevalence of this disease in the women of reproductive age in this region.

SUBJECTS AND METHODS

Women of 15 to 45 years of age coming to Ayub Teaching Hospital as outdoor patients or accompanying persons were included in this descriptive cross sectional study. The study was conducted at the Department of Microbiology, Ayub Medical College in collaboration with the Department of Pathology, Ayub Teaching Hospital, Abbottabad from 1st march 2006 to 28th February 2007 on 500 females selected by non-probability convenience sampling technique.

A detailed history was obtained from each individual including general particulars, history of present and past illnesses, family history, history of blood transfusions, vaccinations, past history of jaundice or hepatitis and any history of hepatitis B

in other family members. History of ear or nose piercing, tattooing or frequent use of intravenous or intramuscular medicines or fluids was recorded next. General physical examination was performed for any evidence of jaundice, anaemia, stigmata of chronic liver disease, ear or nose piercing, tattooing or scars of previous surgery. Systemic examination was carried out next with particular focus on gastrointestinal, hepatobiliary, respiratory, cardiovascular, nervous system and haemopoietic systems.

Serum alanine aminotransferase (ALT) was estimated on fresh blood sample before storage, by the photometric method on RA50 semiautomatic chemistry analyzer[11]. Remaining part of each serum sample was stored in a clean plastic container at -18 °C and a code number was written on it as well as on the respective proforma for the patient for future use. Screening test was carried out in one go by immunochromatographic technique (ICT) using Acon's diagnostic kit of Acon Laboratories (USA).[12] Enzyme linked immunosorbant assay (ELISA) was used as confirmatory test.

The data was recorded in a computer and SPSS 11.0 for windows for statistical analysis. Percentages were calculated for different variables like age, District of residence, marital status and for the subjects positive for HBsAg confirmed by the ELISA test.

RESULTS

Results of the study are shown in Tables 1–7. Majority of the subjects (82%) belonged to the three districts, i.e., Mansehra, Abbottabad and Haripur while 16% subjects were from Battagram and Kohistan. Subjects belonging to neither of these districts were 2% (Table-1). As many as 218 out of 500 (44%) women were aged <25 years while 212 out of 500 (42%) belonged to the age group 26 to 35 years. Only 70 out of 500 (14%) females belonged to the age group 36 to 45 years (Table-2). Only one female was 45 years old (i.e., on the upper limit) while 4 females were aged 15 years (i.e., on the lower limit).

Out of 500 females, 457 (91%) were married while 43 out of 500 (9%) were unmarried (Table-3). Clinical evidence of hepatitis was present in 2 out of 500 (0.5%) individuals (Table-4). Initial screening by immunochromatographic technique (ICT) revealed HBsAg in 15 out of 500 (3%) while the test was negative in 485 out of 500 (97%) subjects (Table-5).

Initially ELISA test was done on 90 samples. It was repeated for one patient after three weeks time because the initial result was doubtful and ultimately turned positive. In this way a total of 91 ELISA tests were performed. ELISA is considered a confirmatory test for the detection of HBsAg, which is a marker of HBV infection. Therefore 15 out of 500 (3%) subjects were ultimately confirmed to be positive for hepatitis B (Table-6). Regarding serum ALT level, the result was within normal limits in 478 out of 500 (96%) and raised in 22 out of 500 (4%) individuals (Table-7). Out of these, 3 were HBsAg positive by ICT and ELISA while the remaining 19 were not.

Table-1: District wise distribution of the subjects (n=500)

District	No of subjects	Percentage
Mansehra	160	32
Abbottabad	130	26
Haripur	120	24
Battagram	55	11
Kohistan	25	05
Others	10	02

Table-2: Distribution of the subjects by age (n=500)

Age in years	No of subjects	Percentage
15-25	218	44
26-35	212	42
36-45	70	14

Table-3: Marital status of the subjects (n=500)

Marital status	No of subjects	Percentage
Married	457	91
Unmarried	43	9

Table-4: Clinical evidence of hepatitis (n=500)

Evidence	No of subjects	Percentage
Present	2	0.5
Absent	498	99.5

Table-5: Results of screening test for HBsAg by ICT (n=500)

Result	No of subjects	Percentage
Positive	15	3
Negative	485	97

Table-6: Results of ELISA test for HBsAg (n=91*)

Group	Tested	ELISA Positive		ELISA Negative	
		No.	%	No.	%
HBsAg positive by ICT method	15	15	100	-	-
HBsAg negative by ICT method, high Alt	19	-	-	19	100
Every 8th sample –ve for HBsAg by ICT method	56	-		56	100

*The test was repeated for one patient hence total number of ELISA= 91

Table-7: Serum aminotransferase level

Result	No. of subjects	Percentage
Normal	478	96
Raised	22	4

DISCUSSION

Seroprevalence of hepatitis B has been studied in pregnant females and young children. A few studies have also been conducted on perinatal screening. No study has been previously conducted on non-pregnant females of reproductive age group in Pakistan.

One hundred and three pregnant women with 35 to 40 weeks of pregnancy admitted in maternity units due to obstetrical reasons were screened for Hepatitis B at Hyderabad, Sindh from January 2003 to December 2003. Out of these 12.6% were positive for HBV.[13] The results of present study are different from this. Dried blood spots from 417 mothers and 538 children were screened for markers of Hepatitis B at Lahore. The results showed that 4% mothers and 3.35% children were positive for HBsAg.[14] A study conducted at Karachi during 1999 on 245 pregnant females revealed that 3.26% were positive for HBsAg.[15] The results of the present study are mostly in accordance with these. Mother to infant transmission of HBV was also studied on a sample of 150 mothers and infants in Karachi.[16] These studies however, focused upon the pregnant females only while the present study was conducted on females of reproductive age group. Two out of fifteen individuals were clinically jaundiced.

Several groups have studied the seroprevalence of Hepatitis B in general public in different provinces of Pakistan. In a study conducted in Rawalpindi, HBsAg was positive in 190 out of 5371 (3.53%) persons. Prevalence rate varied among different ethnic groups. The risk factors and mode of spread were probably common but these differed in importance in various community groups. The importance of further community-based studies to find out specific risk factors in different Pakistani communities was highlighted in order to plan effective health education policy.[6]

The prevalence rate of HBsAg was lower (2.56%) and Alanine aminotransferase (ALT) normal in 84% healthy looking individuals in another similar study conducted in Islamabad.[17] Healthy looking adult males had a prevalence of HBsAg around 3.2% with variation in prevalence rate of HBsAg from city to city.[18] The significance of screening and immunization of the normal population was studied in Karachi, with a prevalence rate of 3% in the normal looking individuals.[19]

The results of the present study, especially regarding individuals from NWFP, are in accordance with those of the above-mentioned studies. However the present findings are different from those of an earlier study carried out in Quetta in which HBsAg was present in 392 out of 2466 (15.9%) individuals.[20] Such a high prevalence has not been reported from any other area of Pakistan. The exact reason of high prevalence rate remains unclear. Difference in the diagnostic techniques could be one of the possible factors. The results of a similar study conducted in Rawalpindi are in line with our observations and highlight the existence of considerable threat of HBV to our younger population, while stressing upon a genuine need for strict adherence to preventive measures.[9]

The results of the present study are also different from an earlier study conducted in Lahore revealing a prevalence of 2.04% among children 6 months to 15 years old. This difference seems to be due to the fact that the study was conducted exclusively on a group of children less than 15 years of age.[21] Findings of the present study are, however in accordance with those of another study conducted on adults from different areas of Pakistan with 3% sero-positivity of HBsAg.[22] The overall prevalence of hepatitis B in apparently healthy persons studied during a countrywide vaccination campaign was 3–4% in most of the cities of Pakistan.[23] Hepatitis-B screening of patients revealed a prevalence rate of 8.6% among surgical patients in Nawabshah and suggested a mandatory screening of all patients prior to surgery.[24] However, a lower prevalence of HBsAg was seen in another similar study conducted in Rawalpindi on surgical patients >20 years of age.[25] A study conducted in Karachi on 387 patients admitted for elective surgical procedure revealed that HBsAg was positive in 25 (6.5%) of patients.[26] A study conducted in Sialkot revealed a significantly higher prevalence of HBV in diabetics than normal population.[27] A study conducted on dental patients in Peshawar showed that the percentage of patients positive for HBsAg was 1.66%.[28] These studies stressed upon the pre-surgical screening of every patient in order to minimize the spread of HBV infection by surgical procedures. Results of the present study are different from these findings.

A study conducted on healthcare workers in Nepal concluded that nurses and non-medical hospital workers were found to be significantly more susceptible to HBV infection than others, thus highlighting the need to implement the internationally recommended measures to protect healthcare workers from blood borne infections.[29] In a study conducted in Peshawar on 80 thalassaemic children below 15 years of age with at least two blood transfusions, it was seen that 6 out of 80 children (7.59%) were positive for HBsAg, highlighting the importance of direct correlation between HBsAg positivity rate and number of blood transfusions.[30]

Why healthy blood donors are more vulnerable to HBV infection is not exactly known.

However, multiple needle pricks and lack of adequate measures for the protection of donor could be one factor, which has not yet been studied. Likewise, slackness on the part of medical staff involved in the process of blood donation and transfusion needs to be addressed in detail in future. The results of most of these studies vary from region to region and are different from the results of the present study. One obvious reason is that these studies focused on healthy blood donors while the present study was conducted exclusively on reproductive females. Difference in the screening techniques could be another reason.

CONCLUSION

Seroprevalence of Hepatitis B in reproductive women of Hazara division is almost similar to the figures already reported from other parts of Pakistan for the general population. It is, however different from the figures reported for special population groups across the country.

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