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HEPATITIS B ANTIGENAEMIA

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ABSTRACT... Introduction: The prevalence of hepatitis B virus infection is a global health issue including Pakistan, causing considerable morbidity and mortality from its chronic sequelae including chronic chronic hepatitis, cirrhosis and liver cancer particularly when HBV infection is acquired early in life. **Objective:** The present study was undertaken with the object to find out the current HBV infection rate and any age and sex differentiation in the population of Faisalabad. **Place and Duration:** This studied was carried out at Madina Teaching Hospital, Faisalabad, from May 2005 to April 2007. **Study Design:** A descriptive, hospital based study. **Methods:** Blood was collected by approved medical techniques for HBsAg immunochromatographic devices were used to screen blood. **Results:** HBs antigen positivity in Faisalabad is currently 1.55%. A significant majority of reactive cases belonged to the male gender (72.91%) and the young age groups 2-4 (43.75%). **Conclusion**: Upon analyzing the results of this study, it was revealed that the number of HBV infected subjects isolated is rather low in this area but the given figure is still notable in view of its high prevalence in the young age groups.

Key words: HBsAg, Hepatitis B Antigenaemia, Hospital Based Population, Faisalabad.

INTRODUCTION

Since its discovery during world war II, infection by hepatitis B virus (HBV) has become a major health issue globally causing considerable morbidity and mortality from both acute infection and chronic sequelae including chronic hepatitis, cirrhosis and liver cancer. Over two billion people show evidence of past or current HBV infection and more than 350 million people are chronic carrier's world wide. About three quarters (3/4)of the world's population lives in regions with high levels of infection[1]. WHO estimates that over five million new hepatitis B virus infections occur yearly. HBV has been ranked as one of the top 10 leading causes of infection disease deaths world wide with 1 to 2 million deaths per year from HBV associated chronic hepatitis cirrhosis or liver cancer[1,2] .

The risk of the developing chronic HBV infection is closely related to age at the time of infection. The average adult with acute disease spontaneously recovers with only 5% developing chronic infection, whereas 90% of HBV infected infants (from mother to child transmission) develop chronic infection with only 10% suffering acute disease from which they then recover[2,3].

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Hepatitis B virus infection is a global public health problem. This disease is most common in the Southern Europe, Africa, Middle and Far East and the means of transmission varies according to the region[2-3]. About 15 to 20% of acute hepatitis B cases are acquired from a known infected contact and could have been prevented by timely pre- or post-exposure prophylaxis.

HBV is usually transmitted by parenteral rout through infected blood or products or by sexual contact and is present in saliva, semen and vaginal secretions. In Europe and US, it is now mainly spread via sexual intercourse and parenteral rout while in many developing countries, almost all children are infected by mother to infant transmission[1-3].

HBs antigen positive mothers may transmit HBV to their neonates at the time of delivery; the risk of chronic infection in the infant is as high as 90 %. HBV is highly prevalent in homosexuals and I/V drug users, but most cases reported in the USA, now result from heterosexual transmission[1,2,5]. Other groups at high risk include medical and paramedical staff in hospitals, clinics, clinical laboratories and blood banks.

Hepatitis B virus is able to survive for up to 7 days outside the human body. It is 50-100 % more infectious than HIV[3]. The incubation period of hepatitis B is 6 weeks to 6 months (average 12- 14 weeks). Primary HBV infection in susceptible (non-immune) hosts can be either symptomatic or asymptomatic. The latter is more common than the former, especially in young children. Most primary infections in adults, whether symptomatic or not, are self-limited, with clearance of virus from blood and liver and the development of lasting immunity to reinfection[1,3,5,6]. Symptoms of acute infection begin to develop when the HBs antigen level rise to peak. About 80% of adults are unaware of their disease. Early symptoms of chronic liver disease are often ignored or the association with the liver disease is not recognized which may lead to serious complications. Persons with chronic hepatitis B, particularly when HBV infection is acquired early in life and viral replication persists, are at substantial risk of cirrhosis and hepato-cellular carcinoma (upto 25- 40%)[3,5,6].

AIMS AND OBJECTIVES OF THE STUDY

Present study was undertaken to:

1. Find out the prevalence rate of HBV infection in the randomly selected individuals reporting to Madina teaching hospital and

2. To evaluate any age and sex differentiation in the prevalence of HBV infection in the above subjects.

SUBJECTS AND METHODS

Location and duration of Study

The study was conducted in the department of clinical pathology, Madina teaching hospital, Faisalabad, from May 2005 to April 2007. This hospital is a newly established teaching and tertiary care hospital located in the suburb of Faisalabad and associated with the University Medical College, Faisalabad. Subject's data: In the present study, subjects in the age group of less than 60 years reporting to the hospital clinical laboratory were screened for HBsAg along with other routine tests and include subjects of both genders and all ages. Subjects, whose history (age, sex, address, etc) was not recorded properly or with duplicate data, were excluded from the study. No attempt was made to obtain any history of contact or likely mode of infection associated with those whose blood tested was HBsAg reactive.

Distribution of Subjects According to Age: Subjects were divided into six different age groups: Group 1 (< 10 years), Group 2 (10-19 years), Group 3 (20-29 years), Group 4 (30-39 years), Group 5 (40-49 years), and Group 6 (50-59 years). [Table-II] Specimen Collection and Preparation: Blood was collected by approved medical techniques. Sera were separated and analyzed on the same day of collection.

Immunoassays

Hepatitis B surface antigen (HBsAg) immunochroniatographic kits/ devices were used to screen blood. The results were recorded as 'Reactive or Non- Reactive.

Statistical analysis

Data was analyzed using SPSS version 12.0. Percentages were calculated directly for HBV infection in different age groups. Statistical significance was accepted as $P < 0.05$.

RESULTS

A total of 3096 persons comprising of 1571 males and 1525 females were included in the study- 50.74 % of the subjects were males and 49.25 % females respectively. Large numbers of subjects were in 4th, 5th and 6th decade of life in both sexes. Forty eight (1.55 %) individuals were found reactive for HBsAg [Table-I]. A higher percentage of male subjects (72.91 %) showed sero-positivity for HBsAg, as compared to females (27.09 %). The difference was significant (p value < 0.05). The Female: Male Ratio was 1: 2.69 [Table-II, III]. Exposure to HBV infection was common (43.75 %) in young age groups 2-4 and highest in those in the age group 4 (2.68 %) and zero % in age group 1 [Table-II]. The youngest baby included in our study was two (2) months old.

Table-I. Frequency of HBsAg reactive cases

Subjects		HBsAg	
Sex	Subjects screened	No.	%age
Male	1571 (50.74%)	35 (72.91%)	2.22
Female	1525 (49.25%)	13 (27.09%)	0.85
Total	3096	48	1.55

Table-II. Age group of subjects screened for HBsAg.

Age group	Age (years)	Subjects Screened	HBsAg reactive cases	%age
Group 1	<10	94	0	00
Group 2	10-19	242	5	2.07
Group 3	20-29	357	4	1.12
Group 4	30-39	448	12	2.68
Group 5	40-49	747	7	0.94
Group 6	50-59	1208	20	1.66
Total	-	3096	48	1.55

Table-III. Sex wise distribution of HBS Ag reactive cases

Age group	Subjects screened	Male	HBsAg reactive	Female	HBsAg reactive
Group 1	94	61	00	33	00
Group 2	242	147	5 (3.40%)	95	00
Group 3	357	216	2 (0.92%)	141	2 (1.41%)
Group 4	448	188	8 (4.25%)	260	4 (1.53%)
Group 5	747	329	5 (2.16%)	418	2 (0.47%)
Group 6	1208	630	15 (2.38%)	578	5 (0.86%)
Total	3096	1571	35 (2.22%)	1525	13 (0.85%)

Limitations of the study

This study took place in Faisalabad, a textile city of Pakistan and the results may not apply to other geographic areas.

DISCUSSION

The frequency of HBV infection (1.55 %) in this study is less than that reported in many previous studies from Pakistan where HBsAg marker was reactive in upto 8.4 % of cases and nearly equal to that reported from Egypt.

But on the other hand, this study also shows that prevalence is quiet high (43.75 %) in the young age groups 2- 4 (in 2nd,3rd and 4th decade of life) and this is different from results from countries in South East Asia and Saudi Arabia where a large percentage of chronic carriers were noted to be children and which has resulted from perinatal transmission[1-3, 7-8].

A lot of studies have been conducted globally on different population groups to detect HBsAg and other HBV markers in the blood but most of the reported studies were conducted on blood donors and the frequency of HBV infection was found to be very low in healthy blood donors as compared to professional and paid donors. The prevalence rates in healthy blood donors are 0.01-0.02% in the UK and Northern Europe, 1.0 -1.5 % in Southern Europe and 6.5 % in parts of sub-Saharan Africa[1-3]. In Pakistan, HBV positivity values are extremely variable, depending on the age and geographic location of the population being analyzed.

Several reported studies from Pakistan show widely varied figures ranging from as low as 1.52 % to as high as 8.4 % in healthy blood donors[9-17] and prevalence of upto 25 % in patients of hepatitis[16]. Like other countries, most of the studies from Pakistan, collect data from blood banks that represents only healthy population-predominantly young male blood donors, so these results cannot be applied to general population for the very obvious reason. Our study represents a hospital based general population that may show an actual prevalence in Faisalabad.

According to various studies, persistent endemic state of HBV infection within a community particularly in developing countries, can be due to therapeutic injections and improperly sterilized surgical instruments[1-2,4-5]. Occupational exposure to percutaneous injuries is also a substantial source of infection with blood borne pathogen of Hepatitis B among health-care workers. This infection is highly preventable and should be eliminated by adopting recommended preventive measures and education of the masses[7,8]. The silent nature of the disease prompts the need for early detection - particularly for those receiving or donating blood or planning surgery.

Hepatitis B surface antigen (HBsAg) is the primary diagnostic marker for HBV infection and of greatest concern is the development of mutant strains that can be more difficult to detect and therefore can result in a false negative test result. High specificity and sensitivity of hepatitis B markers will help to minimize the risk of further transmission by ensuring that those infected with hepatitis B virus are identified as early and as accurately as possible. Clinical laboratories assaying blood specimens for HBV are now increasingly required to recognize the different genotypes and subtypes and detect very low levels of HBsAg[18,19].

According to globally published reports and studies, the primary focus of prophylactic measures should be safer blood supply, safe injection practices in health care settings and decreasing the number of infected health care providers who promote injectable therapy[1-5]. Immunization is also one of the most important strategies to control hepatitis B infection and is recommended for children and adults who are at risk for acquiring HBV infection[7,8]. Preventing HBV infection in women of childbearing age prevents transmission of infection to infants and eliminates risk to the woman of HBV infection.

CONCLUSION

It can be concluded that prevalence of HBV infection is rather low in the studied population but the given figure is still notable in view of its high prevalence in the young age groups. This reservoir of HBV infection in the young population provides an opportunity to investigate risk factors for transmission and raises concern about the prospects of an increasing incidence of its chronic sequelae in future.

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