

Urban Load of Hepatitis B: A Kolkata Based Study

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Abstract

Background: Kolkata is a populous and congested city prone to viral hepatitis of all types in general. Since hepatitis B is the most serious and also the most life-threatening among all types of hepatitis virus infections; a study was done for 1 year to find out the hepatitis B prevalence in a North Kolkata based medical college.

Materials and Methods: Blood was taken from all patients in the medicine outpatient department and indoor wards who were referred to get a blood test for detection of hepatitis B surface antigen (HBsAg) as also from pre-operative and ante-natal patients who needed routine testing for screening of HBsAg. They were tested 3 times with HBsAg card test method and a person testing positive for HBsAg on all the three tests were taken as positive.

Results and Discussion: Out of 8520 persons tested, 97 were found to be positive for HBsAg. Of them, 51 had a history of needle injury, 27 had multiple blood transfusions, 13 had tattoo markings or acupuncture, 4 had a family history of hepatitis B, and only one had concomitant HIV. 89.7% of the patients tested were married and 10.3% were unmarried.

Conclusion: Although Kolkata is an area prone to hepatitis virus infections in general, only 1.13% of the population in our study was positive for hepatitis B proving that Kolkata is a low epidemic area for hepatitis B. The culture here of using only new syringes, taking vaccinations and other education might be responsible for this low epidemic of this disastrous disease, in this region.

Key words: Epidemiology, Hepatitis B surface antigen, Hepatitis B, Urban load

INTRODUCTION

As the name suggests, hepatitis B is an infectious disease of the liver caused by the hepatitis B virus (HBV). This disease is of two types: Acute and chronic. Usually, the disease starts in an asymptomatic manner. However, in some cases, jaundice starts early and is accompanied by nausea, vomiting, weakness, loss of energy, high colored urine, and abdominal pain along with yellow discoloration of the skin and mucous membrane. Mostly these symptoms run a course of 2–3 weeks, and the morbidity continues as mortality is very rare in the initial stages of the disease. In some cases, it has also been seen that the above-mentioned symptoms take even up to 6 months to be manifested completely. There is also a vertical way of

transmission of the disease in which 90% of the patients develop chronic active hepatitis. Hepatitis B is a DNA virus, in contrast to the other liver-related viruses such as hepatitis A, C, D, or E which are all RNA viruses.^[1] Most of the time, a hepatitis B infection is a mono-infection, but often it is subservient to an infection with a delta hepatitis virus. The latter cannot work unless there is an infection concomitantly with hepatitis B.^[2] Apart from going into a state of chronic active Hepatitis, infection with hepatitis B often leads to two major complications both of which are almost fatal, namely, cirrhosis of liver and hepatocellular carcinoma. It is reported that though hepatitis B is a preventable disease by following some simple precautions and taking the full course of its vaccine also, this is being observed as a progressively increasing infection in both Asia and sub-Saharan Africa.^[2] Normally, HBV is transmitted horizontally from an affected person to a healthy victim through exposure to or contamination of blood or body fluid for that matter. It is most common in children, probably because they have less immunity.^[2]

This disease hepatitis B affects, in a year, about 350–400 million people as measured globally.^[3] As a result of that,

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it gives rise to almost permanent morbidity and mortality, mostly due to cirrhosis of liver and hepatocellular carcinoma. Due to this, it is important to emphasize early detection and prompt treatment of hepatitis B as modern day treatment has grossly improved both morbidity and mortality of hepatitis B.^[4,5] It has been outlined by recent international guidelines that the most important target to treat these patients is seroconversion of a positive hepatitis B e antigen to a negative state of serum to that antigen, i.e., to HBeAg, that is, a hepatitis B e antigen-free state of serum.^[6-8] This gives a much more impactful prognosis in as much as it produces much less relapse and lesser rates of complications such as chronic active hepatitis, cirrhosis of liver, and hepatocellular carcinoma. It, therefore is regarded as the first-line treatment option in hepatitis B with a high e antigen in all international guidelines.^[9,10]

Under these contexts, it is imperative that one should know the viral type, load, incidences, and prevalence of hepatitis B in an epidemic-prone area. Now that, Kolkata is often an epidemic-prone area in relation to the disease viral hepatitis in general, it has been decided by us to go for a study on the hepatitis-B burden in a North Kolkata based medical college. Even though it is a tertiary care super-specialty hospital and medical college, it basically caters to the health needs of urban low- to middle-income population and a huge number of slum dwellers. Kolkata, as is unfortunately known as a highly populous, congested, polluted and with a high infectious disease occurrence rate and one of the largest cities of the world, so an in-depth epidemiological study is definitely needed here.

MATERIALS AND METHODS

Study Period

From January 1, 2018, to December 31, 2018, that is one full calendar year covering all seasons of the year. 8520 patients (both male and female) who came for treatment of jaundice or suspected to be suffering from viral hepatitis, at least clinically, in the medicine outpatient department

Table 1: Number of HBsAg positive cases compared to patients tested

| No. of samples received for suspected hepatitis | No. of HBsAg positive cases | Percentage of positive cases |
|---|-----------------------------|------------------------------|
| 8520 | 97 | 1.13 |

HBsAg: Hepatitis B surface antigen

Table 2: Relationship of positive cases with risk factors

| Associated risk factors | Needle injury | Multiple blood transfusion | Family history | HIV/HCV present | Tattoo or Acupuncture | Total |
|--------------------------------|---------------|----------------------------|----------------|-----------------|-----------------------|-------|
| No of +ve patients | 51 | 28 | 4 | 1 | 13 | 97 |
| Percentage (%) of the patients | 52.57 | 28.87 | 4.12 | 1.03 | 13.4 | 100 |

(OPD) were tested for hepatitis B surface antigen (HBsAg), using a standard card test. Many pre-operative and antenatal patients are also routinely tested for HBsAg and so these patients were also included in our study.

Before the commencement of the study, permissions from college authorities and ethical committee were obtained. A signed informed consent form was also obtained from each patient or their nearest kin as the case may be. Apart from the OPD patients, the study was also done on the already admitted but relevant patients. The in patients in whom HBsAg detection was advised on the basis of clinical findings or risk factors, as a part of pre-operative screening and antenatal screening were included in the study irrespective of their age, sex, or marital status. The presence of HBsAg was taken as an indication of hepatitis B infection. However, the patients who were already immunized against the disease by hepatitis B vaccine were excluded from the study.

To 3 ml of blood was collected from each patient by aseptic venepuncture, and the said sample was transferred in a glass vial to the laboratory for detection of HBsAg using the standard card test. In cases where the delay was conjectured, serum was separated from the blood sample, and the separated serum was kept stored in a refrigerator at a temperature of 4–8°C. Serum was separated from the blood by allowing the latter to clot and then subjecting to centrifuge for ½ h at a speed of 3000 r.p.m. Analysis of the sera was done by an immunoassay method based on the antigen capture or sandwich principle using “one step HBsAg rapid card test” for the qualitative detection of HBsAg as per the manufacturers’ instructions. The kit has a sensitivity of 99.8% and a specificity of >99%. The samples which were positive for HBsAg consecutively for 3 times were regarded as positive. The finding were tabulated and analyzed.

RESULTS

The following tables and figures give a glimpse of the results obtained in our study [Tables 1-3].

DISCUSSION

Our study shows that out of 8520 patients tested for HBsAg in their blood, only 97 patients were found to be positive

Table 3: Relationship of HBsAg positivity with marital status

| Marital status | Married (%) | Single (%) |
|------------------------------------|-------------|------------|
| Percentage of HBsAg positive cases | 89.7 | 10.3 |

HBsAg: Hepatitis B surface antigen

for HBsAg. Percentage wise it was 1.13% of the population tested for such a purpose. Out of those 97 patients 51 (52.57%) had a history of needle injuries, 28 (28.87%) had multiple blood transfusions, 4 (4.12%) had family history of hepatitis B, 1 (1.03%) had HIV/HCV present, and 13 (13.4%) had undergone tattoo or acupuncture on them. Furthermore, 89.7% of the hepatitis-B sufferers were married and only 10.3% were single.

Geographically, however, the burden of HBV infection is different in different places. The reasons are that different modes of transmission are prevalent in different population and also the age matters.^[11] Affection at an early age leads to the continuation of chronic active hepatitis B for a long period, increasing the prevalence rate. Furthermore, the epidemiology changes as time advances, particularly in a developed country, most importantly due to the advent of vaccines, peoples', education, and various programs. In countries such as the Asia Pacific and the sub-Saharan African countries, hepatitis B infection is maximum, that is, more than 8% of the population, compared to 1.13% in the case of ours. Majority of infections in those regions are interestingly infected at birth or in early childhood.^[12] According to Mahoney,^[13] 45% of the world's population lives in an area of high prevalence. Again, vertical transmission is more common in Asia than in Africa.^[14] Regions of the world where there is an intermediate range of HBV prevalence (2–7%) include South Asia, the Middle East, North Africa, Eastern, and Southern Europe, and parts of Latin America. Rest of Asia, Northern and Western Europe, North America, and some countries in South America comprise the low prevalence (<2%) populations. Hepatitis B prevalence is maximum in the African region and the Western pacific region, where the disease prevalence is 6.2% and 6.1%, respectively, of the total adult population. The same in North America is 0.7%, European countries 1.6%, Southeast Asia region 2.0%, and Eastern Mediterranean Region is 3.3%. In 1982, the vaccine against hepatitis B was globally introduced. 37 years later also, it is not ubiquitous in practice. HBV is not 100% dependent for survival to our body environment. Even outside our body, it remains alive and active for at least 7 days. Hence, an injection needle used to inject an infected person will remain infective for days hereafter. Therefore, its' use in healthy persons subsequently might lead to infection of the latter. Strict rules of using disposable syringes and that also for once only and thereafter their

proper disposals without chances of harming a person accidentally which can cause incidences of hepatitis B. It is also to be noted that two important causes of infection are through vertical transmission during childbirths and also through vaginal and seminal fluids. Prompt diagnosis and treatment of hepatitis B and making prevalent the practice of safe sex could grossly, therefore, reduce the incidences of hepatitis B.^[15] It is good to know from our studies that our region belong to the low prevalence area but that should not rest us assured, and we should go for education, vaccinations, and other preventive measures. However, it is not found through internet searches that such study was ever done in our region of the world, at least in the recent past. Ours is, therefore, possibly, a novel finding which says that Kolkata is placed among the low hepatitis B prone areas of the world, at least in the present days and within the context of our limited study. The reason for this could be our newer culture of using only new syringes and needles, proper vaccinations and following other related rules to prevent hepatitis B. However, a qualitative study on knowledge, culture, and practices of the general population in Kolkata regarding hepatitis B could reveal many actual points particularly when compared with similar studies done in disease-prone areas in the world.

CONCLUSION

Kolkata is an area prone to frequent epidemics of hepatitis in general. Since hepatitis B is the most serious and threatening among all the different types of hepatitis a study was done to know the burden of hepatitis B in a tertiary care medical college in North Kolkata. It was found that though overall hepatitis incidences were pretty high, the prevalence of hepatitis B here is comparatively low. Further qualitative studies on knowledge, culture, and practice might throw deeper light on this issue.

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