



Short Communication

# Outbreak of hepatitis-B, epidemiology, and transmission in provinces of Pakistan

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## ABSTRACT

Hepatitis B virus (HBV) is recorded as frequent and major problem in the world because HBV infection endures serious and common infectious disease of liver and it is lately cause of death due to innumerable complications such as HIV infection, diabetes, cardiac infection, and many other secondary infections. HBV is one of the supreme communicable diseases can transmit from individual to individual. HBV is a particular disease that is developed in dumpy time era and clue to cause cancer in population because people do not know about transmission of HBV and the major role accomplish in the transmission of HBV is hospitals and its staff. Transmission of hepatitis B happens by blood and blood items, sexual contact. The intrafamilial transmission is likewise reported sometimes. A total of 350 million individuals have hepatitis B infection (HBV) contamination around the world. HBV is remained a severe problem in public health worldwide and about 2.5 billion peoples are currently reported that get infection of hepatitis-B. These cases include that 3.65 million peoples are suffer with chronic hepatitis b and 630,000 deaths are reported annually that is relate with liver failure and HCC hepatocellular carcinoma worldwide. Disease of HBV is imperative for bringing about constant hepatitis and being one of the significant reasons for the cirrhosis and hepatocellular carcinoma. About 33% (2 billion individuals) of the total populace has been spoiled with HBV and 400 million individuals have interminable ailment, out of these 75% of people are living in Asia and Western Pacific edge.

**Keywords:** Overview of hepatitis, Epidemiology, Transmission and province wise distribution

## INTRODUCTION

Hepatitis word is derived from Greek “hepar” means “liver” and “i” is means “inflammation.” Hepatitis is an infection which causes inflammation and enlargement of the liver. Viral hepatitis has five main types A, B, C, D, and E. Hepatitis A and E are largely transmitted through contaminated food and water, while hepatitis B is largely increases through infected blood, sex, or childbirth. Hepatitis C and D are mainly transmitted through blood. Transmission of hepatitis B happens by blood and blood items, sexual contact. The intrafamilial transmission is likewise reported sometimes. A total of 350 million individuals have hepatitis B infection (HBV) contamination around the world.<sup>[1]</sup> Pakistan is a stand out among the most awful impacted countries of the world having hepatitis B.

Hepatitis B virus (HBV) is recorded as frequent and major problem in the world because HBV infection endures serious and common infectious disease of liver and it is lately cause of death due to innumerable complications such as HIV infection, diabetes, cardiac infection, and many other secondary infections. HBV is one of the supreme communicable diseases can transmit from individual to individual. HBV is a particular disease that is developed in dumpy time era and clue to

cause cancer in population because people do not know about transmission of HBV and the major role accomplish in the transmission of HBV is hospitals and its staff.<sup>[2]</sup> Transmission of hepatitis B happens by blood and blood items, sexual contact. The intrafamilial transmission is likewise reported sometimes. 350 million individual have hepatitis B infection (HBV) contamination around the world.<sup>[1]</sup>

Hepatitis-B is belonged to the family Hepadnaviridae. It is also called serum hepatitis based on discovery. It was 1<sup>st</sup> time isolated from serum of the human. It can also called “Dane” particles. It is the smallest enveloped animals virus with 40–46 nanometer in diameter. It has icosahedral nucleocapsid core that containing partially double-standard DNA genome. They contain surface abided glycoproteins which help in entry of the virus and binding with host cell.<sup>[3]</sup>

Enveloped also contains a protein called surface protein (HBsAg), these proteins are very important in diagnosis and immunization. With core DNA dependent, DNA polymerase is contemporaneous. The genome comprises four genes and four open reading frames that encoded five proteins; E, X, S, C, and P. E antigen, S genes encode the surface antigen, C genes encode the core antigen, P genes encode the polymerase, and X genes are act as activator of viral RNA transcription. There is also polymerase enzyme which has reserve transcriptase activity. HBV can transmit through blood, semen, saliva, and body fluid that serve as source of infection. Viral infection vital dose to causes disease in host. HBV can allocate through infected blood transfusion, breastfeeding, needle sticking and sexual contact, and vertical transmission from parent to offspring. About 95% of cases are reported if the mother is infected, then fetus will get infection.<sup>[3]</sup>

### Worldwide epidemiology

HBV is remained a severe problem in public health worldwide and about 2.5 billion peoples are currently reported that get infection of hepatitis-B. These cases include that 3.65 million peoples are suffer with chronic hepatitis b and 630,000 deaths are reported annually that is relate with liver failure and HCC hepatocellular carcinoma worldwide.<sup>[4]</sup> Disease of HBV is imperative for bringing about constant hepatitis and being one of the significant reasons for the cirrhosis and hepatocellular carcinoma. About 33% (2 billion individuals) of the total populace has been spoiled with HBV and 400 million individuals have interminable ailment, out of these 75% of people are living in Asia and Western Pacific edge. All around the hepatitis B normality is different which is more (>8%) in Africa, Asia, and Western Pacific to low (<2%) in Western Europe, North America, and Australia. The condition is intense in Asia, Southern Africa, Latin America, and Europe. It is assessed that more than 2 billion individuals

are contaminated with HBV around the wide.<sup>[5,6]</sup> Out of these 2 billion patients around, a 400 million are experience the ill effects of unending HBV.<sup>[7]</sup>

### Epidemiology of Pakistan

Pakistan is a stand out among the most awful impacted countries of the world having hepatitis B. Different surveys have been performed to look into the transcendence of HCV and HBV in various areas of Pakistan.<sup>[8]</sup>

HBV endemic in Pakistan is precisely high; 8 to 10 million peoples are infected with HBV infection.<sup>[8]</sup> About 0.22% of population of Darband are infected with HBV due to lack of health education, infected person matrimones, lack of awareness, poor sanitation, malsocioeconomics, and close interaction.

From July 2007 to May 2008, a study of the entire nation was directed by Pakistan Medical Research Council (PMRC, 2009) exhibits that the prevalence of hepatitis B is 2.5% in like way people of Pakistan. Examination on sexual orientation astute demonstrates that it is somewhat more normal in guys all over Pakistan (PMRC, 2009). On the premise of territories, hepatitis B was astoundingly typical in Baluchistan (4.3%) while in Sindh, it was 2.5%, in Punjab, it was 2.4%, and 1.3% in Khyber Pakhtunkhwa. The total HBsAg consistency in region Punjab was 2.4%. Up to date, investigation shows that 9 million people are infected from the disease and there is a fast enhancement in the rate of infection.<sup>[9]</sup>

For the most the HBV fundamental in Vehari, Okara, Jhang, Islamabad, Attock, Rahim Yar Khan, Mandi Bhauddin, Gujranwala and Mianwali regions of Punjab district. People who are living in sullied ranges have high extent of viral hepatitis.<sup>[10]</sup> HBV infection is a global public health problem with an estimated 400 million people chronically infected and greater than 500,000 deaths per year (book). HBV infection is the most prevalent disease in developing countries like Pakistan. Nearly 15 million people are infected with hepatitis B virus. HBV genotyping was done were HBV chronic patients from all the four provinces (Punjab, Sindh, Baluchistan, and KPK) of Pakistan for a period of 2 years (2007–2009). Out of the total 3140 consecutive patients, 301 (175; 58.3% of males and 126; 41.7% of females) were indiscriminately selected for HBV genotype A through H determination using molecular genotyping methods. Genotyping of 270 (89.6%) isolates was successfully done, whereas 30 (10.3%) samples failed to generate a type-specific PCR band and were found untypable. Out of the successfully genotyped samples, 40 (14.8%) were with type A, 56 (20.5%) were with type B, 82 (30.2%) were with type C, 41 (15%) were with type D, 2 (0.7%) were with type E, 6 (2.2%) were with genotype F, and total 42(15.6%) were with mixed HBV infections. The prevalence of HBsAg in the four provinces with 95% confidence interval is shown in Table 1. The HBsAg

prevalence was highest in Baluchistan (4.3%). The overall prevalence of HBV in the population was 2.5%.<sup>[11]</sup>

### Transmission of hepatitis B virus

Distinctive parental ways of the transmission of HBV and HCV have been guaranteed which joins sharing of needles, razors, toothbrushes, implantations, unscreened blood transfusions, coincidental needlestick wounds in human administrations providers and organs of transplantation from positive for HBsAg and 440 (3.13%) were found positive for against HCV. The transmission of hepatitis is possible through blood and other body fluids are known since long time. One of the major health problems is hepatitis B virus (HBV).<sup>[2]</sup> Pakistan is highly endemic for HBV.

Transmission of Hepatitis B virus occurs through number of ways. Mostly, it is transmitted through blood that is why it is also known as blood-borne virus. Other modes of transmission include body fluid (breast milk, semen, and saliva), perinatal transmission, endoscopic transmission, and contaminated materials (i.e., needles and syringes) contaminated with body fluids. It is also transmitted through urine and feces.

### Through blood transfusion

HBV transmission occurs when the blood of HBV-infected person is transfused to a healthy person. The clinical consequences of HBV transmission by blood transfusion chiefly depend on strength of recipient immune system and the load of HBV DNA copies present in the transfused blood. The hazard of HBV infection is lessen 5 times due to the presence of donor anti-HBs in the transfused blood.<sup>[4]</sup> Transfusion transmission of HBV is common among the major blood-borne pathogens.<sup>[12]</sup>

### Sexual transmission

HBV found in body fluids such as saliva, vaginal secretion, and semen, thereby it can easily be transmitted while having sex. It is transmitted through saliva and semen during oral and vaginal sex. In adults, unprotected sexual activities are the most common mode of HBV transmission. Sexual transmission can be prevented using dental dams and condom. Never share personal care items such as razor.<sup>[11]</sup>

**Table 1:** Province wise distribution of HBV.

Province	Number of subjects	n (%)	Confidence interval
Sindh	8909	227 (2.5)	2.2–2.9
NWFP	7637	606 (2.4)	2.2–2.6
Baluchistan	5291	97 (1.3)	1.0–1.5
Punjab	25,206	236 (4.3)	3.7–4.8
Total	47,043	1156 (2.5)	2.3–2.6

### Maternal/perinatal transmission

Perinatal transmission means transmission during or around the time of birth. Since HBV is present in vaginal secretion, so virus is transmitted to baby during birth. HBV can also cross the placenta and infect the fetus. Perinatal transmission is the most frequent source of hepatitis B virus (HBV) transmission in prevalent areas and still occurs despite immunoprophylaxis with hepatitis B immunoglobulin (HBIG) (passive immunization) and infant HBV vaccination (active immunization)<sup>[8]</sup> or in spite of prevention (active and passive immunization), perinatal transmission occurs.

### Transmission through contaminated constituents

Hepatitis B infection is common in barbershop visitors; it is due to lack of knowledge about HBV transmission. In Pakistan, there are no proper sterilization facilities in salon even educated medical staff use improperly sterilized materials such as dental equipment and laboratory apparatuses. Contaminated non-single use of instruments such as razors, clippers, and nail brushes is common in salon which is major cause of transmission of HBV. Endoscopy is also a source of HBV transmission because channels of endoscopes came in contact with body fluids.

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