

A Survey on Knowledge and Awareness of Hepatitis B among the slum Dwellers of Bangladesh

This research paper is submitted to the Department of Pharmacy, East West University in the partial fulfilment of the requirements for the Degree of Bachelor of Pharmacy

Submitted by,
Farzana Afroz Rima
ID: 2012-3-70-029



Department of Pharmacy
East West University

Declaration by the Research Candidate

I, Farzana Afroz Rima, ID: 2012-3-70-029, hereby declare that the dissertation entitled “A Survey on Knowledge, Awareness and Attitude of Hepatitis B among the slum people of Bangladesh” submitted by me to the Department of Pharmacy, East West University and in the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, under the supervision and guidance of Nishat Nasrin, Assistant Professor, Department of Pharmacy, East West University, Dhaka.

Farzana Afroz Rima

ID: 2012-3-70-029

Department of Pharmacy,

East West University

Certificate by the Supervisor

This is to certify that the thesis entitled “A Survey on Knowledge and Awareness of Hepatitis B among slum dwellers of Bangladesh” submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy is a bonafide record of original and genuine research work carried out by Farzana Afroz Rima, ID: 2012-3-70-029 in 2016 of her research in the Department of Pharmacy, East West University, under the supervision and guidance of me.

Nishat Nasrin

Assistant Professor

Department of Pharmacy

East West University

Certificate by the Chairperson

This is to certify that the thesis entitled “A Survey on Knowledge and Awareness of Hepatitis B among slum dwellers of Bangladesh” submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy is a bonafide record of original and genuine research work carried out by Farzana Afroz Rima, ID: 2012-3-70-029 in 2016 of his research in the Department of Pharmacy, East West University, under the supervision and guidance of Nishat Nasrin.

Dr. Shamsun Nahar Khan, PhD
Associate Professor and Chairperson
Department of Pharmacy
East West University

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Dedication

This Research Paper is Dedicated to My Beloved Parents and My Friends.

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Abstract

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus. Hepatitis B (HB) is a serious global public health problem which affects liver. Hepatitis viruses are the most common cause of hepatitis in the world but other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis. Slum people are at high risk of Hepatitis B infections. Therefore, awareness is needed to control and prevent the transmission of Hepatitis B. The present study was aimed to assess slum dweller's knowledge about Hepatitis B and Hepatitis B Virus, their perception of risk factor and their attitude towards patient hepatitis B infected person. It was a survey based study and 569 slum dwellers (both male and female) from Meradiya, Badda, Vashantek, BRP and Kalshi were interviewed with structured questionnaire. Most of the respondents were aged between 15-36 years. In this study all respondents confirmed that they have heard about Hepatitis B. About 48.51% of the slum people were conscious about the organ. Among the respondents, 50.97% said that Hepatitis B vaccine is available. According to 75.75% and 74% of the respondents, Hepatitis B can be transmitted through unprotected sex and from mother to fetus respectively. Among the respondents 72.23% mentioned that Hepatitis B can be transmitted through blood transfusion or by sharing infected needle (73.64%). Majority of them had misconception about the mode of transmission like mosquito bite (44.29%), eating or drinking from same glass or plate (43.06%) and wearing same dress (42.53%). Most the respondents (65.00%) thought that using condom can be a mode of prevention of Hepatitis B and about 66.78% thought by avoiding needle sharing, 60.28% think by increasing knowledge and awareness can help to prevent Hepatitis B. Most respondents showed positive attitude towards infected person. About 79% of them wanted to take care in home or community and 70.47% participants told that they would like to continue relationship with the patient. Since only five slums (Meradiya, Badda, Vashantek, BRP, Kalshi) are not sufficient to get a satisfactory data about their perception of the disease so we need to collect more data of slum people throughout the country. Government and different health related organization should take necessary steps to increase knowledge and awareness about Hepatitis B virus and its infection.

Key Words: Hepatitis B/HBV; knowledge; Mode of Transmission; Prevention; Attitude; Slum Dwellers; Bangladesh.

Chapter 1

Introduction

1.1 Overview

The liver is the second largest organ in body and is located on the right upper quadrant of abdomen. It weighs about three pounds and is shaped like a football that is flat on one side. The liver performs many jobs in body. It processes what eat and drink into energy and nutrients that body can use. The liver also removes harmful substances from blood. It performs many critical functions that affect metabolism throughout the body, including: bile production that's essential to digestion, filtering of toxins from the body, excretion of bilirubin, cholesterol, hormones, and drugs, metabolism of carbohydrates, fats, and proteins, activation of enzymes, which are specialized proteins essential to metabolic functions, Storage of glycogen, minerals, and vitamins (A, D, E, and K), synthesis of plasma proteins, such as albumin synthesis of clotting factors. (Liverfoundation.org, 2016).

Hepatitis B, one of the major and common infectious diseases of the liver worldwide is caused by a small enveloped DNA virus, the hepatitis B virus (HBV). The virus was first discovered as "Australia antigen", later named hepatitis B surface antigen (HBsAg), in patient blood. Hepatitis B e antigen (HBeAg) was identified several years later as a marker for patients at high risk for transmission of the disease (Tong *et al*, 2005).

1.2 Hepatitis

Hepatitis refers to an inflammatory condition of the liver. It's commonly caused by a viral infection, but there are other possible causes of hepatitis. (Kidshealth Organization, 2016). These include autoimmune hepatitis and hepatitis that occurs as a secondary result of medications, drugs, toxins, and alcohol. Autoimmune hepatitis is a disease that occurs when body makes antibodies against liver tissue. Hepatitis B is a liver disease caused by the hepatitis B virus (HBV). HBV causes the liver to swell and prevents it from working well (Mayoclinic.org, 2016).

1.3 Types of Viral Hepatitis

There are 5 main hepatitis viruses, referred to as types A, B, C, D and E. These 5 types are of greatest concern because of the burden of illness and death they cause and the potential for outbreaks and epidemic spread. In particular, types B and C lead to chronic disease in hundreds of millions of people and, together, are the most common cause of liver cirrhosis and cancer.

Hepatitis A and E are typically caused by ingestion of contaminated food or water. Hepatitis B, C and D usually occur as a result of parenteral contact with infected body fluids. Common modes of transmission for these viruses include receipt of contaminated blood or blood products, invasive medical procedures using contaminated equipment and for hepatitis B transmission from mother to baby at birth, from family member to child, and also by sexual contact.

1.3.1 Hepatitis A

This type derives from an infection with the hepatitis A virus (HAV). This type of hepatitis is most commonly transmitted by consuming food or water contaminated by feces from a person infected with hepatitis A. (Healthline, 2016). Symptoms include: fever, dark urine, light stool, jaundice. Proper hand washing is a good way to prevent hepatitis A (Southernnevadahealthdistrict.org, 2016).

1.3.2 Hepatitis B

This type derives from an infection with the hepatitis B virus (HBV). This type is transmitted through puncture wounds or contact with infectious body fluids, such as blood, saliva, or semen. Injection drug use, having sex with an infected partner, or sharing razors with an infected person increase your risk of getting hepatitis B. It's estimated by the CDC that 1.25 million people in the United States have chronic hepatitis B and 350 million people worldwide live with this chronic disease. Symptoms can include: abdominal pain, jaundice, fever, joint pain (Healthline, 2016).

1.3.3 Hepatitis C

This type comes from the hepatitis C virus (HCV). Hepatitis C is transmitted through direct contact with infected body fluids, typically through injection drug use and sexual contact. HCV is among the most common blood-borne viral infections in the United States. Approximately 2.7 million Americans are currently living with a chronic form of this infection. Symptoms for HCV are similar to other types of hepatitis, and like HBV, a blood test is needed for diagnosis. Both HBV and HCV increase a person's risk for liver cancer.

1.3.4 Hepatitis D

This is also called delta hepatitis. Hepatitis D is a serious liver disease caused by the hepatitis D virus (HDV). HDV is contracted through puncture wounds or contact with infected blood. Hepatitis D is a rare form of hepatitis that occurs in conjunction with hepatitis B infection. It's very uncommon in the United States.

1.3.5 Hepatitis E

Hepatitis E is a waterborne disease caused by the hepatitis E virus (HEV). Hepatitis E is mainly found in areas with poor sanitation and is typically caused by ingesting fecal matter. This disease is uncommon in the United States. However, cases of hepatitis E have been reported in the Middle East, Asia, Central America, and Africa, reports the CDC. Hepatitis A and E are normally contracted from eating contaminated food or drinking contaminated water. Hepatitis B, C, and D are contracted through contaminated blood. These forms of hepatitis can be either acute or chronic. Types B and C usually become chronic (Kidshealth Organization, 2016).

1.4 Common Symptoms of Hepatitis

If hepatitis is occurred that are usually chronic (hepatitis B and C), may not have symptoms in the beginning. Symptoms may not occur until liver damage occurs. Signs and symptoms of acute hepatitis appear quickly. They include: fatigue, flu-like symptoms, dark urine, pale stool and abdominal pain, Loss of appetite, unexplained weight loss, Yellow skin and eyes, which may be signs of jaundice. Since chronic hepatitis develops slowly, these signs and symptoms may be too subtle to notice (Mayoclinic.org, 2016).

1.5 Hepatitis B virus

Since the discovery of hepatitis B virus in 1966, (Blumberg *et al.*, 1967). Our understanding of its intricacies has continued to unfold. A major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma, hepatitis B virus ranks as an important pathogen throughout the world. Although potent antiviral agents have now emerged, the virus itself and the diseases it causes continue to evolve. The availability of new treatments is currently resulting in new interest in and understanding of the importance of treatment. Coupled with effective vaccines and risk

avoidance, these treatments should begin to diminish the burden of chronic hepatitis B in the near future. This review will highlight our current understanding of hepatitis B virus, including both its virology and clinical features (Lu *et al.*, 2004a).

1.5.1 Morphology of Hepatitis B Virus

The virion of hepatitis B (Dane particle) consists of surface and core. The core is formed in hepatocyte nucleus and the surface particles are made in the cytoplasm. The core contains a DNA polymerase. The structure is double-stranded and circular. It is approximately 3200 nucleotides in length and has a single-stranded gap of 600-2100 nucleotides (Sherlock and Dooley 2002). The DNA-polymerase reaction appears to repair the gap. The core contains a core antigen and another antigen called “e” is a protein subunit of the core (Shindo *et al.*, 2004). Hepatitis B virus is spherical with a diameter of 42nm. Using negative staining of virions adsorbed to the electron microscopic grids, a double-shelled structure of the virions becomes apparent. The outer protein shell (or envelop) is formed by the HBs proteins (Kumar and Agrawal, 2004). Surface structure details such as knobs or spikes as observed on many other enveloped viruses are found on HBV (Sugauchi *et al.*, 2004). The inner protein shell is referred to as the core particle or capsid, having a diameter of 34nm in cryoelectron microscopy (Hanazaki, 2004). It is composed of HBc protein and encloses the viral DNA, which is often positively stained (Tsitsilonis *et al.*, 2004)

Hepatitis B virus

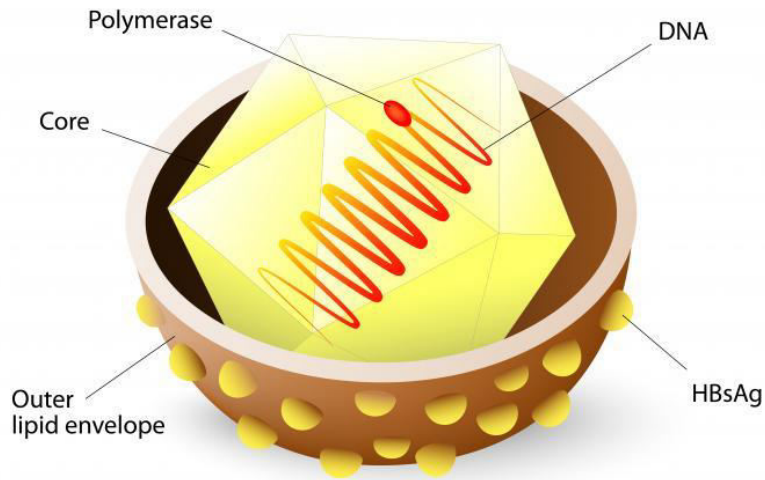


Figure 1.1: Hepatitis B virus (Davis FNP, 2016).

1.5.2 Genotypes of hepatitis B

Hepatitis B virus has been classified into 8 genotypes, A to H, based on genetic sequence variability between genotypes of more than 8%. Certain genotypes predominate within different geographic, regional, and racial groups. Different genotypes are associated with somewhat disparate clinical outcomes, treatment responses, and mutations. The role of genotypes in the clinical management of chronic hepatitis B virus is still under evolution (Kumar and Agrawal, 2004).

1.5.3. Immunopathogenesis

Hepatitis B virus does not cause direct cell injury except in unusual circumstances. The immune response of the host, both cellular and humoral, determines the course of infection and the degree of liver injury in targeted virus-infected hepatocytes. Recognition of hepatitis B virus determinants by cytotoxic T lymphocytes (CD8+ cells) leads to destruction specific to infected hepatocytes, with augmentation by CD4+ cellular responses. If there is abrogation of the immune

response, such as in patients receiving immunosuppressive therapy, control of infection may be lost, hepatitis B virus replication is exaggerated, and a direct cytopathic effect is produced, leading to fibrosing cholestatic hepatitis. On the other hand, severe hepatitis is sometimes observed on withdrawal of immunosuppression, presumably the result of an enhanced immune response (Mao *et al.*, 2004).

1.5.4 Natural history of hepatitis B virus

Because the host immune status governs whether hepatitis B virus infection is resolved or sustained, perinatal infection, which is associated with a partial immune tolerance, leads to chronic ongoing infection in 95% compared with 30% in children 1 to 5 years and less than 5% in adult cases. Neonatal transmission of infection is prevented by treatment of the newborn with hepatitis B immunoglobulin and/or vaccination, although nearly equal efficacy is obtainable with vaccination alone (Lee *et al.*, 2004).

The natural course of hepatitis B virus infection has been described as occurring in 4 stages leading from immune tolerance to full immunity. This construct now requires revisions to include the therapies and mutants described. In the early stages, HBeAg is present as the replication marker, signifying at least 10^5 copies/mL present in serum. Patients who seroconvert to become HBeAg negative and develop anti-HBe will typically have DNA below this level, the threshold of positivity for earlier hepatitis B virus detection method (Shindo *et al.*, 2004).

1.5.5 Epidemiology

Two billion people worldwide have evidence of hepatitis B virus exposure, and an estimated 400 million are actively infected. Worldwide, the prevalence of hepatitis B virus varies greatly. In hyperendemic areas, such as China, Southeast Asia, Western Pacific, and sub-Saharan Africa, the carrier rate exceeds 8% and transmission occurs mainly from mother to child at time of parturition, as well as by horizontal transmission among children less than 5 years of age, and to a lesser extent between sexually active adults. In North America and Europe less than 1% are chronically infected, the result of injection drug use, sexual transmission, nosocomial infection, or emigration from endemic areas. In 30%, no clear mode of transmission is found. In the United States, 1.25 million have chronic hepatitis B virus infection, approximately half of whom are

Asian-Americans. The large quantities of hepatitis B virus in serum and other body fluids ($\sim 10^8$ copies/mL) allow spread by mucosal and percutaneous routes with greater efficiency than is observed with hepatitis C virus ($\sim 10^6$ copies/mL) or human immunodeficiency virus (HIV; $\sim 10^4$ copies/mL) (Tsitsilonis *et al.*, 2004).

1.5.6 Viral mutations

Because hepatitis B virus DNA polymerase replicates through RNA intermediates, it is prone to mutations similar to HIV or hepatitis C virus. Under pressure from external (drugs) or internal (immunologic) stimuli, the polymerase and core genes are most affected. Mutations in the P gene are observed in patients treated with antiviral nucleoside analogues such as lamivudine. Spread of lamivudine resistance beyond patients treated with the drug has been documented. Most mutations occur in the YMDD binding motif, a 4-amino acid sequence comprising the catalytic site for the replicating RNA strand. The presence of lamivudine in the chain interrupts replication. A single base pair substitution replacing methionine with isoleucine or leucine in the YMDD motif impairs binding of lamivudine, allowing renewed replication capacity. The C gene and its pre-core region encode the nucleocapsid (HBcAg) and HBeAg, a soluble secreted peptide associated with high levels of replication (Sugauchi *et al.*, 2004). Seroconversion of HBeAg with its loss and the appearance of anti-HBe are associated with greatly diminished replication and disease quiescence. However, patients with mutations in the pre-core or core region continue to replicate actively, failing to secrete HBeAg and show progressive liver disease. In Asia and southern Europe, 30% to 90% of patients demonstrate these HBeAg-negative mutations, compared with 10% to 40% in the United States. Antibodies to HBcAg appear early in infection; they are not protective but signify previous exposure. The immunoglobulin-M component of anti-HBc indicates acute infection or reactivation. Antibodies produced in response to the surface antigen (anti-HBsAg) are protective but evolve more slowly in acute infection and are the hallmark of resolved infection and immunity to hepatitis B virus. Vaccine preparations containing HBsAg result in formation of anti-HBs without concomitant anti-HBc (Lai *et al.*, 2003a).

1.6 Geographical distribution

Hepatitis B prevalence is highest in sub-Saharan Africa and East Asia, where between 5–10% of the adult population is chronically infected. High rates of chronic infections are also found in the Amazon and the southern parts of eastern and central Europe. In the Middle East and the Indian subcontinent, an estimated 2–5% of the general population is chronically infected. Less than 1% of the population of Western Europe and North America is chronically infected (World Health Organization, 2016).

1.7 Types of hepatitis B

Hepatitis B infection may be either short-lived (acute) or long lasting (chronic).

1.7.1 Acute infection

When we're infected with HBV as healthy adults, about 90 percent of us are able to get rid of the infection within six months. It can take up to six months for our immune systems to generate antibodies and eradicate the infection in our liver. This short-term infection is called acute hepatitis B (Livezey *et al.*, 2002).

To determine if have an acute or chronic infection, must be tested for hepatitis B over a six-month period. The specific test indicates who are infected is the hepatitis B surface antigen (HBsAg) test. This antigen covers the surface of the virus and usually there are lots of HBsAg in blood when you're infected. If you test positive for HBsAg for longer than six months, it means a chronic hepatitis B infection (Craxi and Cooksley, 2003).

But, if no longer test positive (or “reactive”) for HBsAg after six months and develop hepatitis B surface antibodies (HBsAb), then it clearly indicates hepatitis B after an “acute” infection. There are some additional blood tests that doctor may order to get a better understanding of the infection, but not everyone has access to these tests. Some tests are rather expensive and they may still need to be repeated over time in order to confirm the diagnosis. The good news is that hepatitis B is not typically an emergency.

Here is more good news. If a healthy adult is newly or acutely infected, know that the chances are good that the hepatitis B infection will go away on its own. It is rare that you require medication to get rid of the virus, the immune system does that for his/her body. A person with a

new hepatitis B infection may not have any symptoms, or they may not be very notable. For example, you might feel more tired. About 70 percent of people newly-infected with hepatitis B never experience symptoms.

But, some people experience severe symptoms like jaundice (yellowing skin or eyes), severe nausea or vomiting, or a bloated stomach (unrelated to your weight), and they need to see a doctor immediately. If you have a new or acute infection, even these drastic symptoms may not necessarily mean that there is need any form of treatment, but it will need to be monitored with additional tests to make sure the liver is safe.

If it can't confirm that he/she was infected as a child, will need to wait the six months to find out if he/she cleared their infection. It is need to take precautions during this time to make sure that don't spread the infection to others (Akarca *et al.*, 2004).

1.7.2 Chronic infection

When we're infected as newborns or young children, our immature immune systems don't notice or fight the virus and it travels to our liver and begins reproducing. With no opposition from our immune systems, a hepatitis B infection can continue for years. When a hepatitis B infection lasts longer than six months, it is considered a chronic or long-term infection (Goldstein *et al.*, 2002). Most people with chronic hepatitis B were infected at birth or during early childhood. Immunization with the hepatitis B vaccine and hepatitis B immune globulin (HBIG), if available, within 12 to 24 hours of birth can break this mother-to-child infection cycle, but the birth vaccine dose and often HBIG is not always available around the world (Hepatitis B Foundation, 2016).

1.7.3 People who are at risk for chronic disease

The likelihood that infection becomes chronic depends upon the age at which a person becomes infected. Children less than 6 years of age who become infected with the hepatitis B virus are the most likely to develop chronic infections.

1.7.3. (a) In infants and children

- 80–90% of infants infected during the first year of life develop chronic infections; and
- 30–50% of children infected before the age of 6 years develop chronic infections.

1.7.3.(b) In adults

- Less than 5% of healthy persons who are infected as adults will develop chronic infection; and
- 20–30% of adults who are chronically infected will develop cirrhosis and/or liver cancer

(World Health Organization, 2016).

1.7.4 Chronic Hepatitis B and Hepatocellular carcinoma

Among other causative factors, chronic hepatitis B virus appears responsible for a large number of hepatocellular carcinoma cases worldwide. Resolution of chronic hepatitis B significantly diminishes the risk of subsequent hepatocellular carcinoma, as does seroconversion to HBeAg negativity (Wolters *et al.*, 2002).

Vaccination against hepatitis B virus has decreased viral carriage, resulting in a lower incidence of hepatocellular carcinoma in high-density regions, and greater future gains are expected. The use of routine screening with ultrasonography on an annual basis is often recommended but may not be cost-effective (Leung, 2002).

1.8 Transmission

The hepatitis B virus can survive outside the body for at least 7 days. During this time, the virus can still cause infection if it enters the body of a person who is not protected by the vaccine. The incubation period of the hepatitis B virus is 75 days on average, but can vary from 30 to 180 days. The virus may be detected within 30 to 60 days after infection and can persist and develop into chronic hepatitis B (Shang *et al.*, 2002).

In highly endemic areas, hepatitis B is most commonly spread from mother to child at birth (perinatal transmission), or through horizontal transmission (exposure to infected blood), especially from an infected child to an uninfected child during the first 5 years of life. The development of chronic infection is very common in infants infected from their mothers or before the age of 5 years (Shang *et al.*, 2002).

Hepatitis B is also spread by percutaneous or mucosal exposure to infected blood and various body fluids, as well as through saliva, menstrual, vaginal, and seminal fluids. Sexual

transmission of hepatitis B may occur, particularly in unvaccinated men who have sex with men and heterosexual persons with multiple sex partners or contact with sex workers. Infection in adulthood leads to chronic hepatitis in less than 5% of cases. Transmission of the virus may also occur through the reuse of needles and syringes either in health-care settings or among persons who inject drugs. In addition, infection can occur during medical, surgical and dental procedures, through tattooing, or through the use of razors and similar objects that are contaminated with infected blood (World Health Organization, 2016)

Hepatitis B infection is caused by the hepatitis B virus (HBV). The virus is passed from person to person through blood, semen or other body fluids. Common ways HBV is transmitted include:

- **Sexual contact**

Someone may become infected if has unprotected sex with an infected partner whose blood, saliva, semen or vaginal secretions enter someone's body.

- **Sharing of needles**

HBV is easily transmitted through needles and syringes contaminated with infected blood. Sharing intravenous (IV) drug paraphernalia puts you at high risk of hepatitis B.

- **Accidental needle sticks**

Hepatitis B is a concern for health care workers and anyone else who comes in contact with human blood.

- **Mother to child**

Pregnant women infected with HBV can pass the virus to their babies during childbirth. However, the newborn can be vaccinated to avoid getting infected in almost all cases. Talk to your doctor about being tested for hepatitis B if you are pregnant or want to become pregnant (Mayoclinic.org, 2016).

1.9 How long symptoms of hepatitis B last

Hepatitis B in adults will usually pass within one to three months. This is known as acute hepatitis B and rarely causes any serious problems.

Occasionally, the infection can last for six months or more. This is known as chronic hepatitis B.

Chronic hepatitis B mainly affects babies and young children who get hepatitis B. It's much less common in people who become infected later in childhood or when they're an adult.

The symptoms of chronic hepatitis B are the same as those mentioned above, but they tend to be quite mild and may come and go. Some people may not have any noticeable symptoms. However, without treatment, people with chronic hepatitis B can develop problems such as scarring of the liver (cirrhosis). Some people carry the virus in their bodies and are contagious for the rest of their lives (Nhs.uk, 2016)

1.10 Diagnosis

It is not possible, on clinical grounds, to differentiate hepatitis B from hepatitis caused by other viral agents and, hence, laboratory confirmation of the diagnosis is essential. A number of blood tests are available to diagnose and monitor people with hepatitis B. They can be used to distinguish acute and chronic infections (World Health Organization, 2016).

1.10.1 Hepatitis B Surface Antigen Test

A hepatitis B surface antigen test shows if anyone contagious. A positive result means has hepatitis B and can spread the virus. A negative result means not have hepatitis B. This test doesn't distinguish between chronic and acute infection.

1.10.2 Hepatitis B Core Antigen Test

The hepatitis B core antigen test shows whether anyone currently infected with HBV. Positive results usually mean has chronic hepatitis B. It may also mean the recovering from acute hepatitis B.

1.10.3 Antibody Hepatitis B Surface Antigen Test

An antibody hepatitis B surface antigen test shows whether anyone is immune to HBV. A positive test means it is very unlikely will contract hepatitis B. There are two possible reasons for a positive test. One, may have been vaccinated, or two, may have recovered from an acute HBV infection.

1.10.4 Liver Function Tests

Hepatitis B symptoms can mimic the symptoms of other conditions, including liver diseases. Liver function tests check of blood for heightened enzymes from liver. The results of these tests

can reveal whether liver is under stress. It can also identify signs of disease. If these tests are positive, require testing for hepatitis B. Hepatitis viruses are a major cause of liver damage.

1.10.5 Physical Examination

During a physical examination, doctor may press down gently on abdomen to see if there's pain or tenderness. Doctor may also feel to see if liver is enlarged. If skin or eyes are yellow, doctor will note this during the exam (Mayoclinic.org, 2016).

1.10.6 Liver Biopsy

A liver biopsy is an invasive procedure that involves the doctor taking a sample of tissue from your liver. This is a closed procedure. In other words, it can be done through the skin with a needle and doesn't require surgery. This test allows doctor to determine if an infection or inflammation is present or if liver damage has occurred.

1.10.7 Blood Tests

Blood tests used to detect the presence of hepatitis virus antibodies and antigen in the blood will indicate r confirm which virus is the cause of the hepatitis (Mayoclinic.org, 2016).

1.10.8 Viral Antibody Testing

Further viral antibody testing may be needed to determine if a specific type of the hepatitis virus is present.

1.10.9 HBV Genotyping and Drug Resistance Tests

Currently there are several genotypic methods for determining HBV genotype. Meaning determining HBV genotype A, B, C, D, E, F, G and H as well as determining genotypic mutations in the drug target of the viral genome.

The INNO-LiPA assay from Innogenetics uses differential probe hybridization to the RT polymerase gene region of the virus as well as determining core mutations in the core gene regions of the virus. This assay requires a minimum viral load of 150 IU/mL present in the patient's serum. A DNA sequencing method from Siemens HC Diagnostics known as the Trugene HBV Genotyping Assay also detects mutations in the polymerase and surface gene regions of the HBV virus and that requires a min HBV DNA level of 200 IU/mL to yield

consistent results. Finally there are laboratory-developed assays that use the DNA sequencing method mainly looking at the polymerase gene region as well as the core gene regions. 1.10.10 HBV Resistance Mutations.

The literature has shown that individuals with HBV virus showing different genotypic resistance mutations at these sites confer resistance to these drugs.

Here in the pink color, the four resistance mutations codons confer resistance to Lamivudine; the green show resistance to Adefovir; the blue resistance to Entecavir; and the light purple are resistance mutation codons to Telbivudine. Lastly, the black colored mutation confers resistance to Telbivudine (World Health Organization, 2016).

1.11 Treatments for Hepatitis B

1.11.1 Hepatitis B Immune Globulin

Talk to your doctor immediately if you have been in contact with someone who has hepatitis B within the last 24 hours. It may be possible to prevent infection with an injection of HBV immune globulin. This is a solution of antibodies that work against HBV (Mayo Clinic, 2016).

1.11.2 Treatment Options for Hepatitis B

Acute hepatitis B usually doesn't require treatment. Most people will overcome an acute infection on their own. However, bed rest will help you recover.

Antiviral medications can treat chronic hepatitis B. These help you fight the virus. They may also reduce the risk of future liver complications.

May need a liver transplant if hepatitis B has severely damaged the liver. A liver transplant means a surgeon will remove your liver and replace it with a donor liver. Most donor livers come from deceased donors.

1.11.3 Testing for Liver Cancer

Having hepatitis B increases your risk for getting liver cancer, so your doctor may suggest an ultrasound test of the liver every 6 to 12 months. Finding cancer early makes it more treatable. Ultrasound is a machine that uses sound waves to create a picture of your liver. Ultrasound is

performed at a hospital or radiology center by a specially trained technician. The image, called a sonogram, can show the liver's size and the presence of cancerous tumors (World Health Organization, 2016).

1.11.4 Liver Transplant

A liver transplant may be necessary if chronic hepatitis B causes severe liver damage that leads to liver failure. Symptoms of severe liver damage include the symptoms of hepatitis B and generalized itching, a longer than usual amount of time for bleeding to stop, easy bruising, swollen stomach or ankles, spiderlike blood vessels, called spider angiomas that develop on the skin. Liver transplant is surgery to remove a diseased or injured liver and replace it with a healthy one from another person, called a donor. If the doctors tell that need a transplant, should talk with them about the long-term demands of living with a liver transplant. Medicines taken after liver transplant surgery can prevent hepatitis B from coming back. (Niddk.nih.gov, 2016)

1.11.5 Eating, Diet, and Nutrition

If any have chronic hepatitis B, he/she should do things to take care of him/herself, including eating a healthy diet. It is necessary to avoid drinking alcohol, which can harm the liver. Talk with the doctor before taking vitamins and other supplements (Davis FNP, 2016).

1.12 Prevention

The vaccine has an excellent record of safety and effectiveness. Since 1982, over 1 billion doses of hepatitis B vaccine have been used worldwide. In many countries where between 8–15% of children used to become chronically infected with the hepatitis B virus, vaccination has reduced the rate of chronic infection to less than 1% among immunized children.

As of 2014, 184 Member States vaccinate infants against hepatitis B as part of their vaccination schedules and 82% of children in these states received the hepatitis B vaccine. This is a major increase compared with 31 countries in 1992, the year that the World Health Assembly passed a resolution to recommend global vaccination against hepatitis B. Furthermore, as of 2014, 96 Member States have introduced the hepatitis B birth dose vaccine (Davis FNP, 2016).

The hepatitis B vaccine is the mainstay of hepatitis B prevention. WHO recommends that all infants receive the hepatitis B vaccine as soon as possible after birth, preferably within 24 hours.

The birth dose should be followed by 2 or 3 doses to complete the primary series. In most cases, 1 of the following 2 options is considered appropriate,

- A 3-dose schedule of hepatitis B vaccine, with the first dose (monovalent) being given at birth and the second and third (monovalent or combined vaccine) given at the same time as the first and third doses of diphtheria, pertussis (whooping cough), and tetanus – (DTP) vaccine; or
- A 4-dose schedule, where a monovalent birth dose is followed by three monovalent or combined vaccine doses, usually given with other routine infant vaccines.

The complete vaccine series induces protective antibody levels in more than 95% of infants, children and young adults and protection lasts at least 20 years and is probably lifelong (World Health Organization, 2016).

All children and adolescents younger than 18 years-old and not previously vaccinated should receive the vaccine if they live in countries where there is low or intermediate endemicity. In those settings it is possible that more people in high-risk groups may acquire the infection and they should also be vaccinated. They include: people who frequently require blood or blood products, dialysis patients, recipients of solid organ transplantations; people interned in prisons; persons who inject drugs; household and sexual contacts of people with chronic HBV infection; people with multiple sexual partners; health-care workers and others who may be exposed to blood and blood products through their work; and travelers who have not completed their hepatitis B vaccination series, who should be offered the vaccine before leaving for endemic areas (Mayo Clinic, 2016).

In addition, implementing of blood safety strategies, including quality-assured screening of all donated blood and blood components used for transfusion, can prevent transmission of HBV. Safe injection practices, eliminating unnecessary and unsafe injections, can be effective strategies to protect against HBV transmission. Furthermore, safer sex practices, including minimizing the number of partners and using barrier protective measures (condoms), also protect against transmission (World Health Organization, 2016).

Vaccines are medicines that keep you from getting sick. Vaccines teach the body to attack specific viruses and infections. The hepatitis B vaccine teaches your body to attack the hepatitis B virus.

Since the 1980s, a hepatitis B vaccine has been available and should be given to newborns and children in the United States. Adults at higher risk of getting hepatitis B should also get the vaccine. The hepatitis B vaccine is given in three shots over 6 months. Drawing of a female health care provider giving a hepatitis B vaccination shot in the upper left arm of a female patient.

Anyone can protect him/herself and others from getting hepatitis B by: by using a condom during sex, by not sharing drug needles and other drug materials, by not donating blood or blood products, wear gloves if any has to touch another person's blood or open sores, by not sharing or borrow a toothbrush, razor, or nail clippers, by making sure any tattoos or body piercings are done with sterile tools, by informing doctor and dentist if anyone has hepatitis B, by drawing of a health care professional wearing hospital clothing and putting on gloves.

If someone is pregnant and has hepatitis B, then it is necessary to tell the doctor and staff who will deliver the baby. The hepatitis B vaccine and hepatitis B immune globulin should be given to the baby right after birth. The vaccine will greatly reduce the chance of the baby getting the infection (Davis FNP, 2016).

Chapter: 2

Literature Review

2.1 Limited access to hepatitis B/C treatment among vulnerable risk populations: an expert survey in six European countries

This study was undertaken to investigate access to treatment for chronic hepatitis B/C among six vulnerable patient/population groups at-risk of infection: undocumented migrants, asylum seekers, people without health insurance, people with state insurance, people who inject drugs (PWID) and people abusing alcohol. An online survey was conducted among experts in gastroenterology, hepatology and infectious diseases in 2012 in six EU countries: Germany, Hungary, Italy, the Netherlands, Spain and the UK. A four-point ordinal scale measured access to treatment (no, some, significant or complete restriction). From 235 recipients, 64 responses were received (27%). Differences in access between and within countries were reported for all groups except people with state insurance. Most professionals, other than in Spain and Hungary, reported no or few restrictions for PWID. Significant/complete treatment restriction was reported for all groups by the majority in Hungary and Spain, while Italian respondents reported no/few restrictions. Significant/complete restriction was reported for undocumented migrants and people without health insurance in the UK and Spain. Opinion about undocumented migrants in Germany and the Netherlands was divergent. Although effective chronic hepatitis B/C treatment exists, limited access among vulnerable patient populations was seen in all study countries. Discordance of opinion about restrictions within countries is seen, especially for groups for whom the health care system determines treatment access, such as undocumented migrants, asylum seekers and people without health insurance. This suggests low awareness, or lack, of entitlement guidance among clinicians. Expanding treatment access among risk groups will contribute to reducing chronic viral hepatitis-associated avoidable morbidity and mortality (Falla *et al.*, 2016).

2.2 Mother-to-child transmission of hepatitis B: extent of knowledge of physicians and midwives in Eastern region of Ghana

Mother -to -Child transmission of hepatitis B infection remains a major public health concern particularly in Africa. Adequate knowledge of physicians and midwives is crucial in averting most of the hepatitis B viral transmissions from mothers to their new-born. However, there is a dearth of evidence on extent of knowledge of physicians and midwives in Ghana in spite of the increasing incidence of hepatitis B infection in the country. This study therefore assessed the

knowledge level of physicians and midwives regarding Mother-to-Child transmission of hepatitis B in the Eastern region of Ghana. A Cross sectional survey was conducted between August to November, 2015 using semi-structured self-administered questionnaire. Study participants were recruited from five health facilities and their level of awareness and knowledge about Mother-to-Child transmission of hepatitis B were assessed. The level of statistical significance was set at 0.05 alpha level. The findings showed that both physicians and midwives had good knowledge on Mother-to-Child transmission of hepatitis B infection. However, there were some knowledge gaps regarding effective hepatitis B prevention from mother to their newborns such as the use of hepatitis B vaccine and immunoglobulin. Additionally, 49.2 % (n = 62) of the participants had never attended any workshop on Mother-to-Child transmission of hepatitis B since completion of formal training. Developing appropriate periodic training programs on current issues of hepatitis B for physicians and midwives in Eastern region will further enhance their knowledge. It is recommended that, further study examine if the knowledge of the respondents is translated into practice (Adjei *et al.*, 2016).

2.3 Treating chronic hepatitis B virus: Chinese physicians' awareness of the 2010 guidelines.

This study was conducted to investigate Chinese physicians' awareness of the 2010 guidelines on the treatment of chronic hepatitis B virus (HBV) infection. This was a quantitative survey that investigated the characteristics and practices of physicians who were treating patients with hepatitis B, the profile of their patients and physician practices regarding the diagnosis and treatment of HBV at the time of the survey. Participants were randomly selected from available databases of Chinese physicians and requested to complete either an online or paper-based survey. Data from the survey responses were analyzed. For data validation and interpretation, qualitative in-depth interviews were conducted with 39 of the respondents. Five-hundred completed surveys, from 663 physicians were available for analysis. A mean of 175 chronic hepatitis B (CHB) patients was seen by each physician every month, of whom 85 (49%) were treated in line with therapeutic indications stated in the 2010 guidelines. A total of 444 (89%) physicians often (> 60% of the time) adhered to the guidelines. Most physicians used antiviral medications as recommended. For patients with compensated and decompensated cirrhosis, 342 (68%) and 336 (67%) of physicians, respectively, often followed the recommendation to use

potent nucleos(t)ide analogues with a high genetic barrier to resistance, using the appropriate treatment more than 60% of the time. Physicians from infectious disease or liver disease departments were better informed than those from gastrointestinal or other departments. The majority of Chinese physicians often adhere to Chinese 2010 CHB guidelines and are well-informed about the use of antiviral medications for hepatitis B (Wei *et al.*, 2016).

2.4 Awareness of hepatitis B infection among healthcare students in a private medical college in Odisha

The emergence of the blood-borne pathogens and the increasing number of infected patients and the increasing interest in dental health care compel the dental professionals to have thorough knowledge about communicable diseases and the MBBS and nursing students are always at risk because of their profession. As hepatitis B infection is a major health hazard throughout the world, healthcare students should have thorough knowledge about this disease. had conducted a similar kind of study in Punjab in which the sample size was smaller and it included only the interns, whereas the present study was conducted to assess the level of knowledge, attitude, and behavior about hepatitis B infection among healthcare students of all academic years because they are indulged in clinical work since third year of their curriculum. A cross-sectional survey was conducted of all the students starting from 1(st) year to final year and the interns of MBBS, BDS, and nursing at KIIT University. The questions were obtained from a study performed in Turkey in 2010 and were modified by an infection control expert. Questions in multiple choice format were in English and it was a self-administered questionnaire consisting of three parts (knowledge, attitude, behavior). Then, ethical clearance for the study was obtained from the institutional ethical committee, KIMS. Subsequently, the students were well informed and explained about the study. Students who voluntarily wanted to participate were included in the study. Questionnaire containing 20 questions to assess the level of knowledge, attitude, and behavior about hepatitis B was distributed among the students. Data were compiled and statistical analysis was done. The response rate was 83% (N = 332). In this study, majority (96.99%) were aware of transmission of HBV infection by blood, body fluid, and secretion. The level of knowledge was higher in MBBS students than BDS and nursing students (MBBS > BDS > nursing). Attitude toward the disease was higher in MBBS students than BDS and nursing students (MBBS > BDS > nursing), whereas behavior was higher in BDS students than MBBS

and nursing students (BDS > MBBS > nursing). In this study, overall knowledge and attitude toward hepatitis B infection were higher in MBBS students than in dental and nursing students, whereas behavior of dental students toward the disease was quite satisfactory than MBBS and nursing students (Choudhury *et al.*, 2015).

2.5 Knowledge of Hepatitis B Transmission Risks among Health Workers in Tanzania

Healthcare workers are at increased risk of contracting hepatitis B virus (HBV), particularly in settings of high HBV seroprevalence, such as sub-Saharan Africa. Therefore, HBV knowledge was evaluated among health-care workers in rural Tanzania by distributing an HBV paper survey in two northern Tanzanian hospitals. There were 114 participants (mean age 33 years, 67% female). Of the participants, 91% were unaware of their HBV status and 89% indicated they had never received an HBV vaccine, with lack of vaccine awareness being the most common reason (34%), whereas 70% were aware of HBV complications and 60% understood routes of transmission. There was a significant difference in knowledge of HBV serostatus and vaccination between participants with a medical background and others, $P = 0.01$ and 0.001 , respectively. However, only 33% of consultants (senior medical staff) knew their HBV serostatus. There was no significant difference between knowledge of HBV transmission routes and occupation. This study reveals low knowledge of HBV serostatus and vaccination status among hospital workers in Tanzania (Debes *et al.*, 2016).

2.6 Attitudes and Awareness Regarding Hepatitis B and Hepatitis C amongst Health-care Workers of a Tertiary Hospital in India

Hepatitis is an inflammatory disease of the liver. In several cases, it may lead to permanent liver damage including liver cirrhosis or hepato-cellular carcinoma and may ultimately lead to death. Health-care workers (HCWs), due to their regular contact with patients are at a high-risk of acquiring this disease. The aim of this study was to assess the knowledge and attitude toward hepatitis B and C infection among the health-care interns and correlate the level of awareness to the attitude they behold toward the disease. A closed ended questionnaire consisting of questions to evaluate the knowledge regarding hepatitis B and C infection and attitude of the (HCWs/interns) was duly filled by 255 participants including, 100 dental, 100 medical, and 55 nursing interns. Statistical analysis was carried out using the Chi-square test, ANOVA test, post-

hoc test and Pearson's correlation. Although most of the interns were aware of the existence of hepatitis B and C infection, the level of awareness regarding the modes of transmission and vaccination was found to be dissatisfactory. Awareness level regarding the infection among nursing interns was statistically significantly lower than the dental and medical interns. A direct positive correlation as found between awareness score and behavior score, which reveals that interns with better awareness level had better attitudes toward the infection and prevention of its transmission. There is an urgent need to increase the level and quality of training among HCWs to prevent the spread of hepatitis B virus and hepatitis C virus (Setia *et al.*, 2013).

2.7 Epidemiology of hepatitis B virus in Bangladeshi general population

Hepatitis B virus (HBV) is encountered sporadically the year round in Bangladesh. It results in a wide range of liver diseases, with asymptomatic acute hepatitis at one end to hepatocellular carcinoma (HCC) at the other end of the spectrum. All 1018 individuals of different age groups and sex with varied religious, educational and social backgrounds were tested for HBsAg by ELISA. The positive samples were further tested by ELISA for HBeAg. Before testing, blood samples were preserved at -20 degree centigrade. The study was conducted in a semi-urban location on the outskirts of Dhaka. Of the 1018 individuals, 5.5% tested positive for HBsAg. None were tested positive for anti-HCV. Among the HBsAg-positive population, 58.93% were HBeAg-positive and the rest 41.07% HBeAg-negative. There was a male predominance and those who were tested positive were mostly between 16 and 50 years of age. Major risk factors for exposure to HBV appeared to be injudicious use of injectable medications, treatment by unqualified, traditional practitioners, mass-vaccination against cholera and smallpox, barbers and body piercing. HBV remains a major cause of morbidity and mortality in Bangladesh and they have a long way to go before they may bid farewell to this deadly menace (Mahtab *et al.*, 2008).

2.8 Low level of Hepatitis B knowledge and awareness among pregnant women in the Kintampo North Municipality: implications for effective disease control

Over 2 billion people are infected with Hepatitis B virus (HBV) and about 240 million are chronic carriers of the virus. Chronic HBV infection is an important cause of liver cancer. The infectivity of HBV is hundred times higher than the HIV virus yet it receives comparatively little attention in public health. The study assessed knowledge and awareness of HBV among pregnant

women in the Kintampo Municipality of Ghana. A cross-sectional survey was conducted among pregnant women attending antenatal clinic in two facilities between September 2010 and November 2010. Analysis was performed to determine factors associated with hepatitis B awareness. Forty-one percent of the 504 women were aware of hepatitis B viral infection, 33.5% of the women were able to correctly mention the transmission routes of Hepatitis B. The radio was the most (42%) mentioned source of information on HBV and the least source of information were places of worship (2.7%). After adjusting for other factors, level of education; SSS/SHS and above OR=4.2, P<0.01, 95% CI (2.5, 7.0) and occupation (Civil servant/Student); OR= 3.8, P<0.01, 95% CI (1.7, 8.5) were the important predictors of Hepatitis B awareness. There is a low level of knowledge and awareness of HBV among pregnant women in this municipality. This could potentially hamper effective HBV prevention and control in Ghana. Education on hepatitis B need to be included in health promotion activities (Abdulai *et al.*, 2016).

2.9 Awareness about Hepatitis B viral infection in coastal Eastern India

Hepatitis B is a major health problem in India. To prevent transmission and progression of the disease in the community, proper community awareness about the disease, including prevention, is necessary. The objective of this study was to investigate the awareness amongst the general population about hepatitis B virus, including knowledge regarding vaccine. The study was conducted in Department of Gastroenterology of SCB Medical College. The patients attending the OPD and their attendants were subjected to a questionnaire about different aspects of hepatitis B. Binary logistic regression analysis (SPSS 16) was employed to assess the statistical importance of the observations. In all, 682 individuals (65% patients, 35% non-patients) were studied; 78% were males while 22% were females. Majority were in the age group of 31-40 years. 65% hailed from rural area; 65% were poor. About half of the subjects attended state run medical centers for medical attention; only 17% preferred medical colleges. Awareness about the disease and the vaccine among the subjects was 38% and 32%, respectively. 50% of those who were aware had no knowledge about route of transmission, infectivity, or importance of vaccination. Educated individuals were more aware about hepatitis B vaccine (P < 0.05). Those who read newspaper and listened to radio were more aware about hepatitis B (P < 0.05), and its vaccine (P < 0.05). The percentage of vaccination was 20% among study subjects, but in 30%, their children were vaccinated. The common reason for non-vaccination was lack of awareness

(50%); of them, 60% blamed government/doctors/media for their ignorance. Majority (56%) received the vaccine from government hospitals or health centers. Only (10%) obtained vaccination from private centers. Reasons cited for non-vaccination included ignorance (50%), carelessness (12%), high cost (10%), and non-availability (6%). Source of information regarding hepatitis B included television (75%), newspapers (55%), and radio (26%). Only about one-third of the populations in coastal Eastern India are aware about hepatitis B and its vaccine. Less than a third of the populations are vaccinated for hepatitis B. The educated, especially those who read newspapers and listened to radio, were more aware about the disease/vaccine. The government health agencies and physicians should work together to educate the masses about hepatitis B and its vaccine (Misra *et al.*, 2009).

2.10 The Health, Enlightenment, Awareness, and Living (HEAL) Intervention: Outcome of an HIV and Hepatitis B and C Risk Reduction Intervention

African American women have among the highest HIV/AIDS and hepatitis B and C incidence rates in the United States, especially among those homeless or incarcerated. The objective of this study was to evaluate the Health Enlightenment, Awareness and Living Intervention, designed to decrease HIV/AIDS, hepatitis and related risky behaviors. The thirteen-session intervention was implemented among homeless and formerly incarcerated low-income African American women, ages 18 to 55, in Atlanta, Georgia from 2006 to 2010. A single group repeated measures study design was employed and consisted of a pre-test (n = 355) group, an immediate post-test (n = 228) group with a response rate of 64%, and a six-month follow up (n = 110) group with response rate of 48%, completing a 135-item survey. Paired-sample t-tests, McNemar tests, and repeated measures ANOVA were applied to compare survey results. Participants demonstrated statistically significant increases in hepatitis B and C knowledge over time ($p < 0.001$). Statistically significant decreases were also reported for unprotected sex in exchange for money, drugs or shelter ($p = 0.008$), and sex under the influence of drugs or alcohol ($p < 0.001$). Reported substance use decreased with statistical significance for alcohol ($p = 0.011$), marijuana ($p = 0.011$), illegal drugs ($p = 0.002$), and crack/cocaine ($p = 0.003$). Findings broaden the evidence base related to the effectiveness of HIV/AIDS and hepatitis risk reduction interventions designed for homeless and previously incarcerated African American women (Henry-Akintobi *et al.*, 2016)

Significance of study

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus. It is a major Global health problem. It can cause chronic infection and puts people at high risk of death from cirrhosis and liver cancer. A vaccine against hepatitis B has been available since 1982. The vaccine is 95% effective in preventing infection and the development of chronic disease and liver cancer due to hepatitis B. (World Health Organization, 2017).

Hepatitis B prevalence is highest in sub-Saharan Africa and East Asia, where between 5–10% of the adult population is chronically infected. High rates of chronic infections are also found in the Amazon and the southern parts of eastern and central Europe. In the Middle East and the Indian subcontinent, an estimated 2–5% of the general population is chronically infected. Less than 1% of the population of Western Europe and North America is chronically infected. Worldwide, 240 million people have been infected with hepatitis B and about 600 000 people die every year due to the consequences of hepatitis B. Hepatitis B prevalence is highest in sub-Saharan Africa and East Asia. Most people in these regions become infected with the hepatitis B virus during childhood. High rates of chronic infections are also found in the Amazon and the southern parts of Eastern and Central Europe. In the Middle East and the Indian sub-continent, an estimated 2–5% of the general population is chronically infected. Other groups at higher risk of hepatitis B infection include Indigenous Australians, people participating in high risk sexual activity and people who inject drugs (O'Sullivan *et al.*, 2004). In Australia, 213,300 people are chronically infected with hepatitis B. However, nearly half of those living with chronic hepatitis B in Australia are undiagnosed hence any other cause of cancer death in Australia and untreated chronic hepatitis B is a major contributor (National Liver Cancer Prevention Policy, 2012). Most people diagnosed with liver cancer in Australia die within one to two years – many in the first month after diagnosis. Hepatitis B infection is considered to be acute during the first 6 months after infection. If hepatitis B virus tests (HBsAg+) are positive after 6 months, then a person is considered to have 'chronic' (long term) hepatitis B infection which can last a lifetime (O'Sullivan *et al.*, 2004).

As it is a global issue and in our country, the incidence of diseases caused by hepatitis B, is increasing day by day. There are several studies are being conducted and still ongoing on

knowledge and awareness in different countries around the world. As far our knowledge there is no major significant studies regarding this topic. Therefore, this was designed to identify the current stage of knowledge of mode of transmission, mode of prevention and control and attitude towards infected person among the slum dwellers of Bangladesh.

Aims of the study

Aims of the study were:

- To determine the knowledge level of people of slum in Bangladesh about Hepatitis B
- Their perception of risk factor of Hepatitis B.
- Their attitude towards Hepatitis B infected person.

Chapter 3

Methodology

3.1 Type of the Study

It was a survey based study.

3.2 Study Population

The targeted group was slum dwellers who reside in Vashantek, BRP and Kalshi, Meradiya, Badda, The survey was conducted among 569 people including male and female of all age except the children.

3.3 Inclusion Criteria

- Both male and female
- Anyone over the age of 12 years

3.4 Exclusion Criteria

- Anyone but slum dwellers
- Children

3.5 Data Collection Method

The data was collected through questionnaire that is formed in English language. It consists of multiple choice type questions to find out the knowledge about Hepatitis B among slum dwellers. The data was collected by face to face interview.

3.6 Development of the Questionnaire

The questionnaire was developed based on different findings in available journal and research paper. Also from the observation of different behavior of Bangladeshi people.

3.7 Sampling Technique

In this study random sampling was followed to obtain a more scientific result that could be used to represent the entirety of the population.

3.8 Data collecting period

The duration of data collection was about four months that started from June 2016 to October 2016.

3.9 Data Analysis

After collecting, all the data were checked and analyzed with the help of Microsoft Office Excel 2010.

Chapter 4

Results

Results

4.1.1 Age Distribution

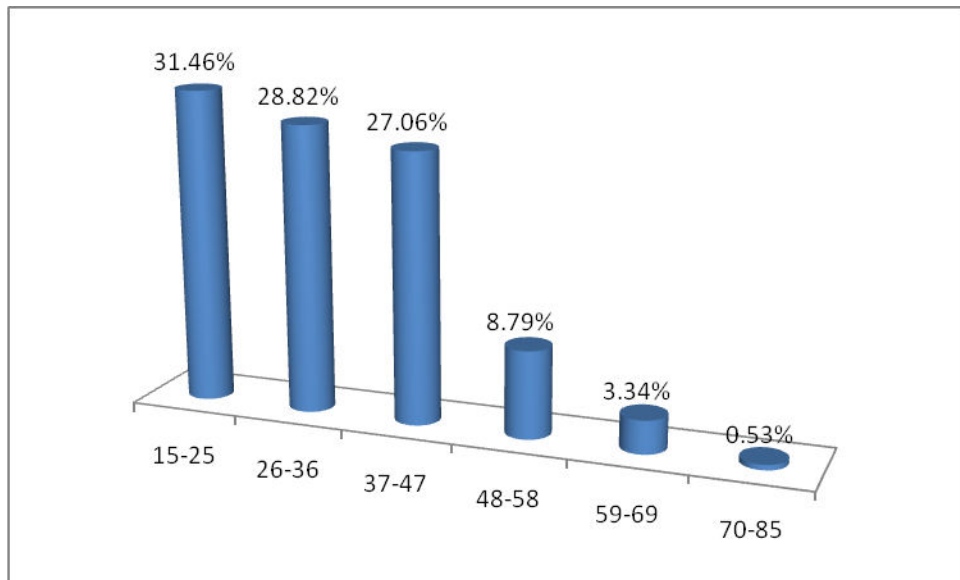


Fig 1 .2: Age Distribution

Among the respondents 31.46% slum people were in the age range of 15-25, 28.82% were in the age range of 26-36, 27.06% were in 37-47, 8.79% were in 48-58 years, 3.34% were in 59-69 years, 0.53% were in 70-85 years.

4.1.2 Gender Distribution

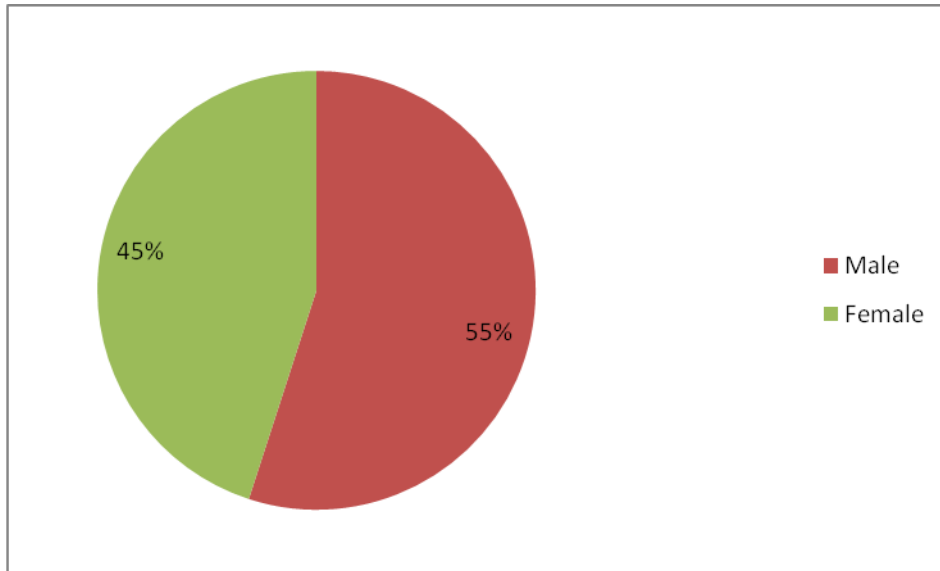


Fig: 1.3.: Gender Distribution

In this study 55% slum people were male and 45% were female.

4.1.3 Marital Status



Fig 1.4 Marital status

Among the total people maximum population (about 66.78%) were married, 32.34% were Single and very few were separated and widowed (0.70% and 0.18%).

4.2.1 Source of information

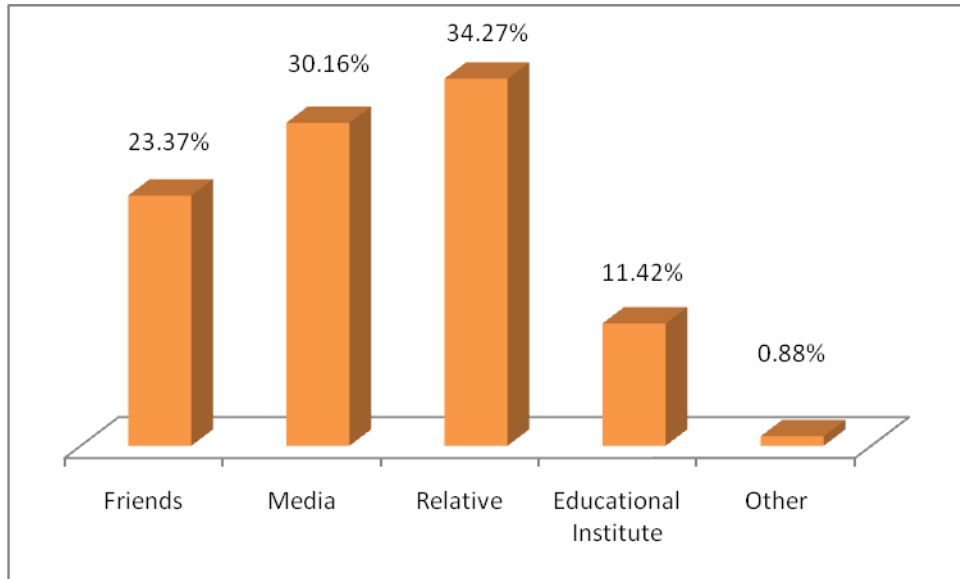


Fig 1.6.: Heard about Hepatitis B

In this study all responders confirmed that they have heard about Hepatitis B. It was found that 34.27% people gained information from relatives, 30.16% from media, 23.37% from friends, 11.42% and 0.88%, heard it from educational institute and other sources respectively.

4.2.2 Knowledge about affected part of the body

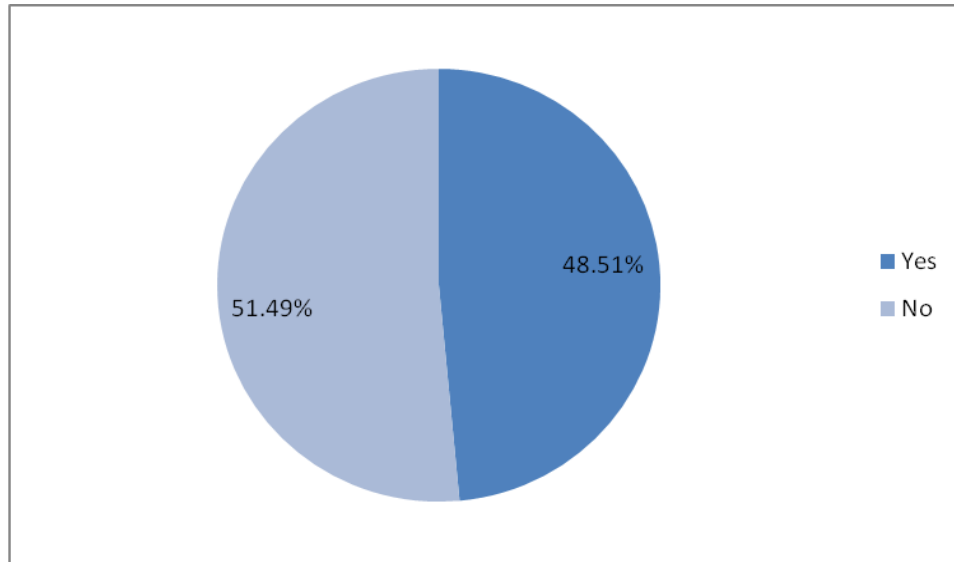


Fig 1.7: Knowledge about affected part of the body

Most (48.51%) of the slum people were conscious about the organ that is affected by Hepatitis B, Whereas the rest did not have the idea about the organ affected.

4.2.3 Knowledge of virus that cause Hepatitis B

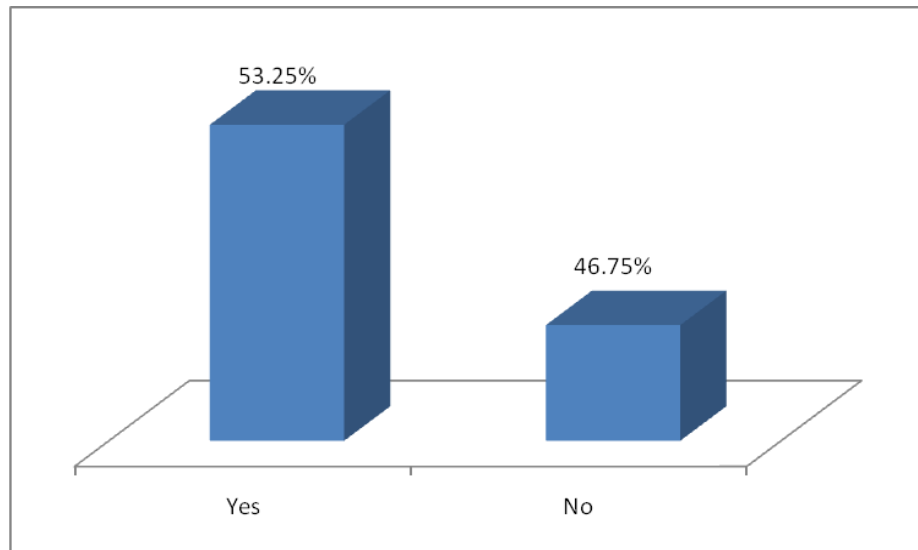


Fig 1.8: Knowledge about virus that causes Hepatitis B

In this study it observed that majority of the slum people (53.25%) said that Hepatitis B was caused by virus and (46.75%) people didn't know about this.

4.2.4 Knowledge about treatment

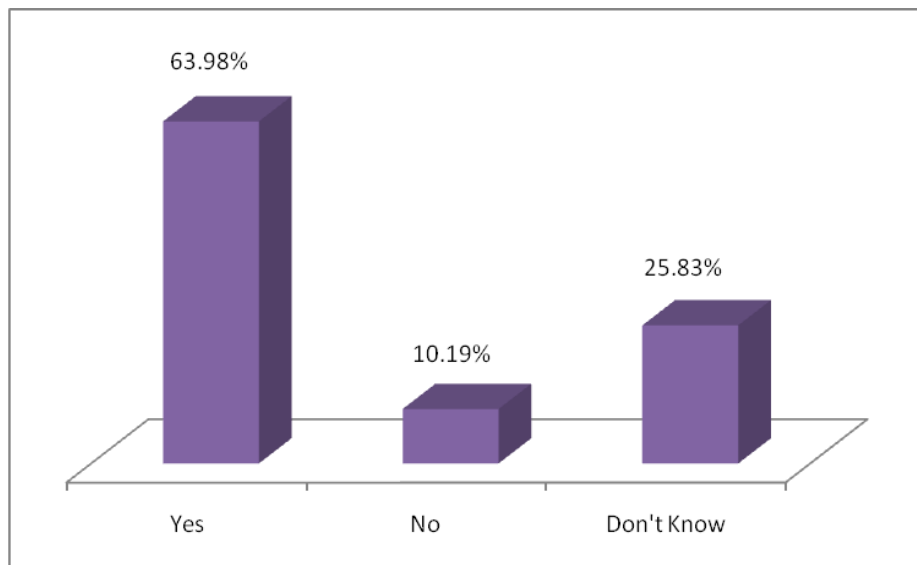


Fig 1.9: Knowledge about treatment

The study showed that 63.98% of the people answered that they think, it was treatable, 10.19% thought that it was not treatable and 25.83% had no knowledge about it.

4.2.5 Knowledge about vaccine of Hepatitis B

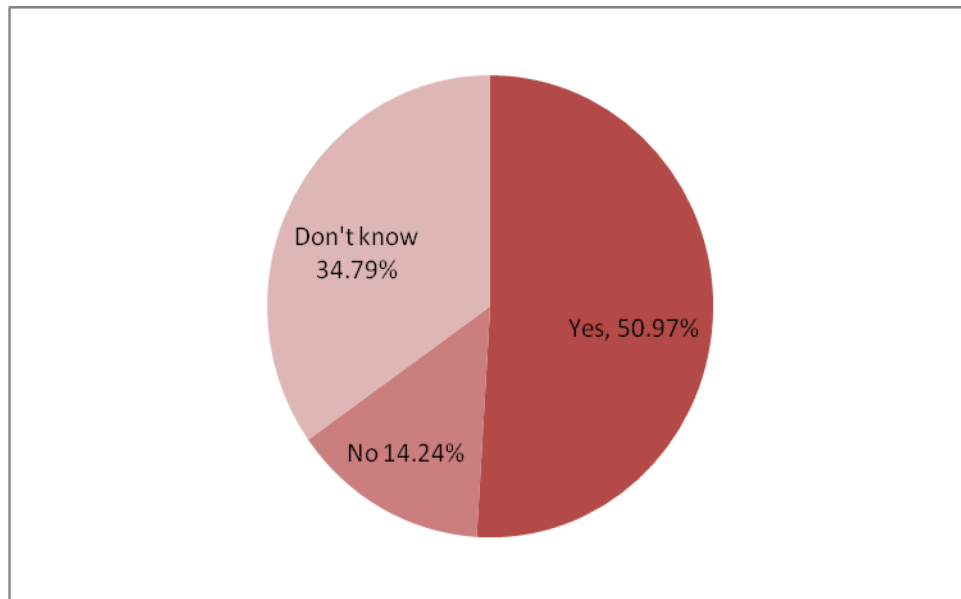


Fig 1.10: Knowledge about availability of vaccine

Among the respondents, 50.97% people said that Hepatitis B vaccine is available, 14.24% disagreed with the availability and 34.79% didn't know about it.

4.2.6 Taking vaccine of Hepatitis B

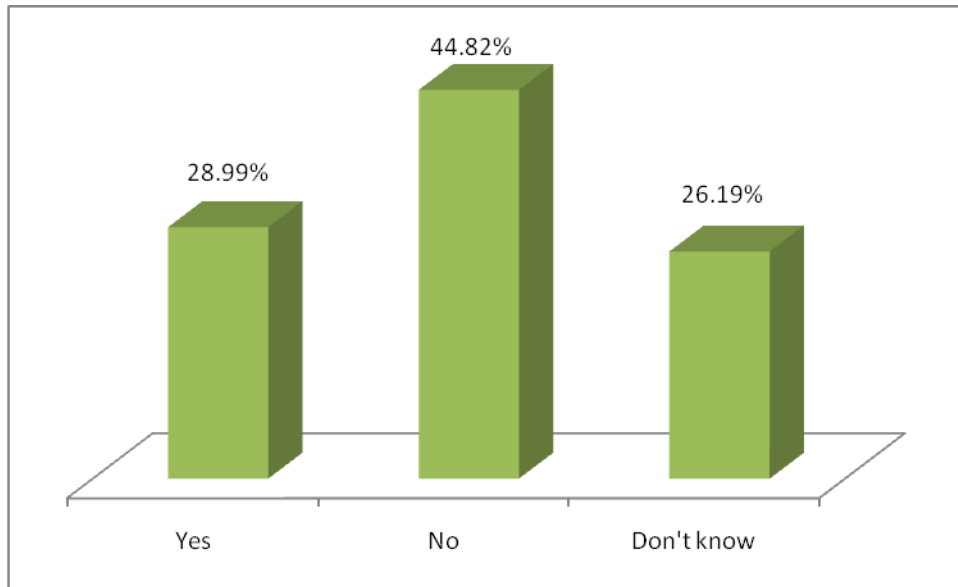


Fig 1.11: Information about vaccine taken

During the study it was found that 28.99% slum people took vaccine, 44.82% didn't take vaccine and 26.19% didn't know whether they take vaccine or not.

4.2.7 Family member or friend has Hepatitis B

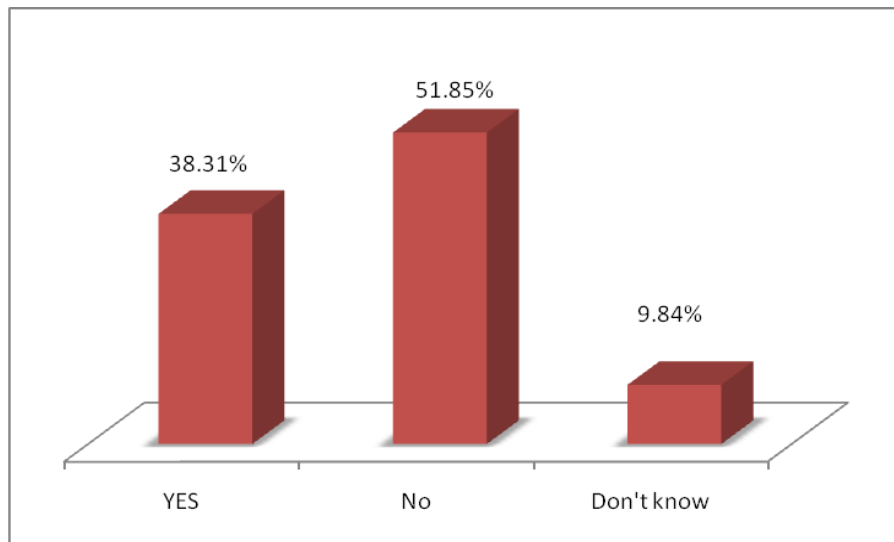


Fig 1.12: Hepatitis B infection among the family members of the respondents

Among the respondents 38.31% confirmed that they have the Hepatitis B patient in their family, 51.85% responded that their family was free from Hepatitis B and 9.84% population was not confirmed on the question.

4.3 Correct mode of transmission of Hepatitis B

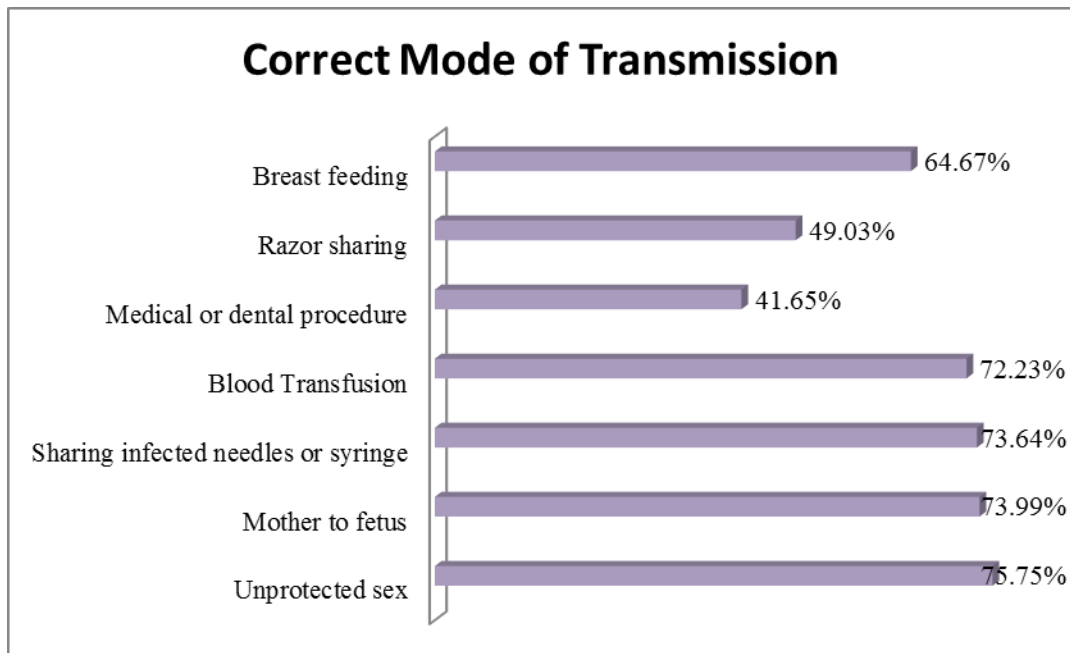


Fig: 1.13.: Mode of transmission of Hepatitis B

From the people 75.75% supported that “Hepatitis B can be transmitted by unprotected sex”. About 74% said Hepatitis B can be transmitted from mother to fetus. 73.64% marked sharing infected needles or syringe as a way of mode of transmission. 72.23% claimed “by blood transfusion hepatitis B can be transmitted”. About 41.65%, 49.03%, 64.67% population informed Hepatitis B can be transmitted by, medical or dental procedure, razor sharing and Breast feeding respectively.

4.4 Misconception about mode of transmission of Hepatitis B

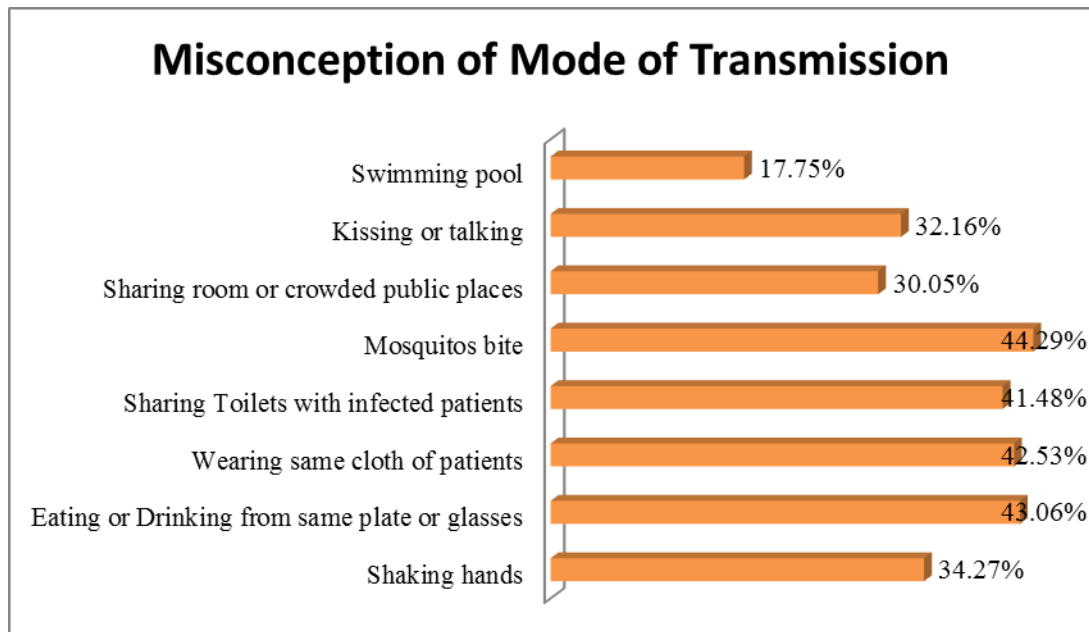


Fig 1.14: Misconception about mode of transmission of Hepatitis B

Some of the slum people didn't have clear concept about mode of transmission of Hepatitis B, 34.27% confirmed by shaking hand Hepatitis B can be transmitted. About 42.53% said by wearing clothes of patients can be transmitted and 44.29% responders said by Mosquitoes bites can be transmitted. Among them 41.48% said by sharing toilet with infected person Hepatitis B can be transmitted and 17.75% transmission did by swimming pools.

4.5 Prevention and control of hepatitis B

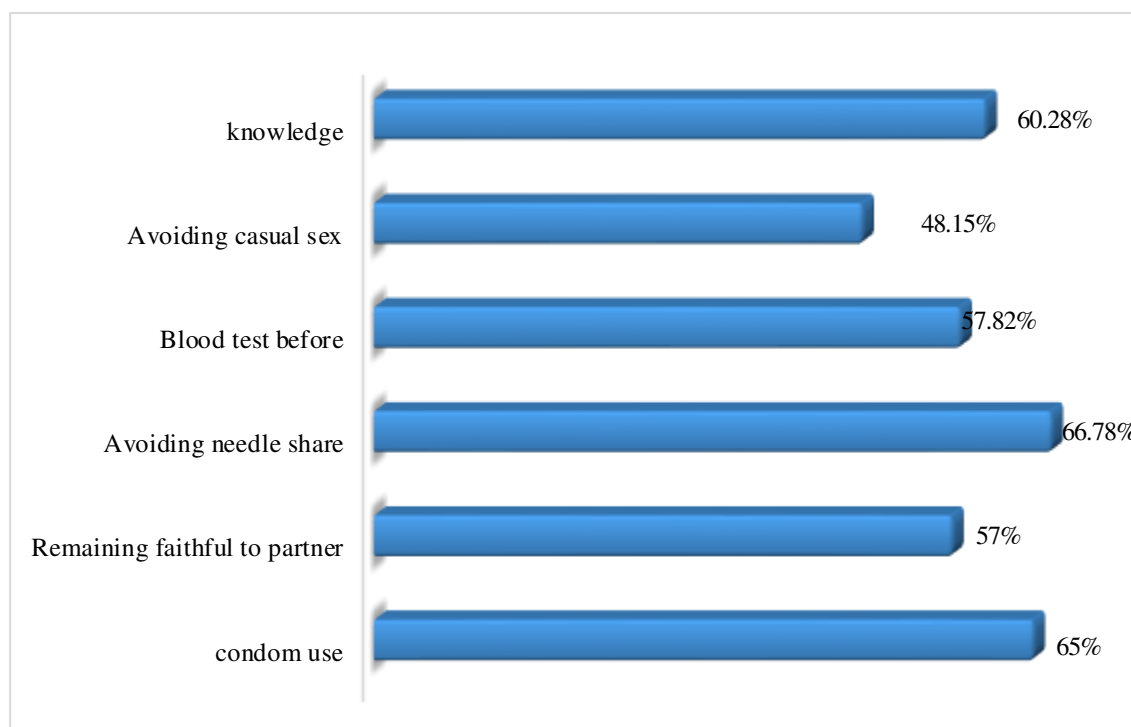


Fig: 1.15: Prevention and control of hepatitis B

Among the respondents most of the slum people (60.28%) said “Knowledge and education is the prevention and control method”. Among the respondents 65%, 57%, 66.78%, 57.82%, 48.15% marked condom use, remaining faithful to single partner, avoiding needle share, blood test before marriage, avoiding casual sex respectively as the control and prevention method respectively.

4.6 Attitude towards infected person

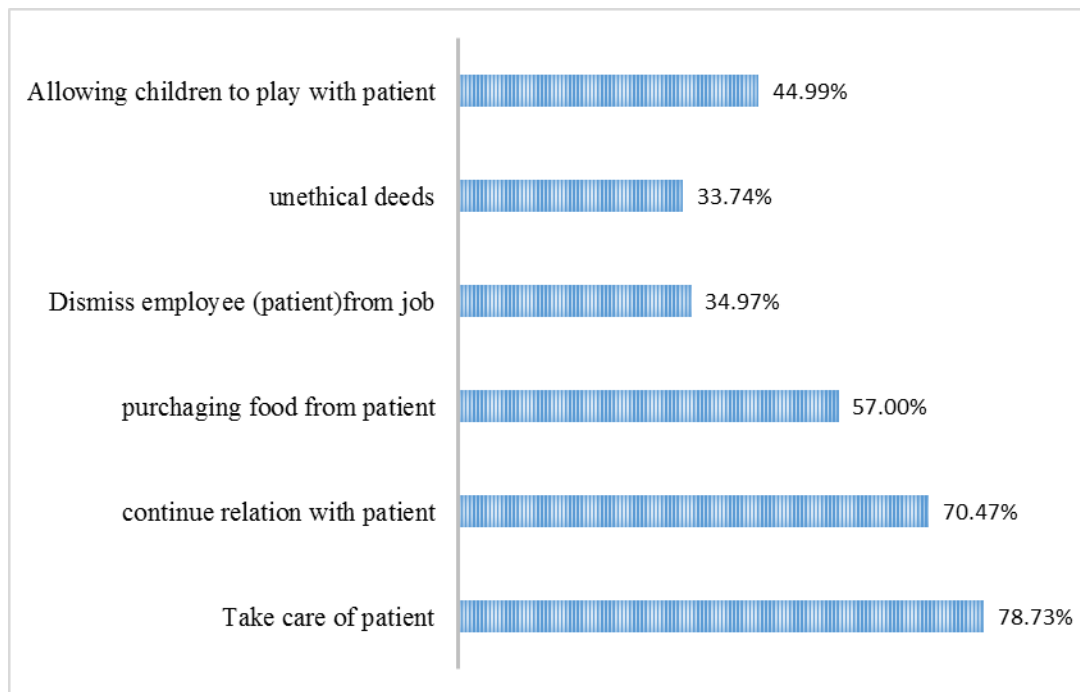


Fig: 1.16: Attitude towards infected person

During the study, most of the slum people had positive attitude towards Hepatitis B infected person. Majority (78.73%) were positive in take care, only few didn't want to do that. Somebody didn't have any opinion about caring. (70.47%) people want to continue relationship. If the shopkeeper is infected most of the people were positive in buying food from him/her, some didn't buy. Most of the people have good attitude about the presence of infected person.

Chapter 5

Discussion and conclusion

Discussion

Hepatitis B (HB) is a serious global public health problem which affects liver and caused by hepatitis B virus (HBV). It is contagious and easy to be transmitted from one infected individual to another by blood to blood contact, mother to child, unprotected sexual intercourse, and other barber shop and beauty salon equipment and also breast feeding. Hepatitis B virus infections are rapidly spreading in the developing countries including Bangladesh due to the lack of health education, poverty, illiteracy and lack of hepatitis B vaccination.

The study was carried out on 569 slum people. Most of our study population were aged 15-25 years. Most of our study populations were male (55.00%) and married (66.78%).

In our study all the respondents have heard about Hepatitis B. Most of the respondents heard about the disease from their relatives (33.27%), media (30.16%), friends (23.37%) and educational institute (11.42%). One study conducted in Ghana among pregnant women showed that 42% mentioned radio as the main source of information on Hepatitis B (Ali Abdulai *et al.*, 2016).

Among the respondents, 58.9% of the slum people were aware about the organ that is affected by Hepatitis B whereas the rest did not have the idea about the organ affected. In this study it was observed that majority of the slum people (53.25%) said that Hepatitis B is caused by virus and (46.75%) people don't know about this.

Leung *et al.*, 2010 showed that 506 respondents were successfully interviewed in February 2010. Approximately half of respondents (55%) were aware that hepatitis B virus is the most common cause of chronic viral hepatitis in Hong Kong (Leung *et al.*, 2010).

The study showed that 63.98% of the people answered that they think that it was treatable, 10.19% thought that it was not treatable and 25.83% had no knowledge about treatment. Among the respondents, 50.97% people said that Hepatitis B vaccine was available, 14.24% disagreed with the availability and 34.79% slum people didn't know about it.

One study was conducted to know the knowledge, attitude, and practices of 300 married women in reproductive age group living in different districts in Bangladesh, regarding HBV infection. Only 20% women were aware and 50% had micro concept about the mode of transmission of HBV (Rahman and Mannan, 2010).

During the study it was found that 28.99% slum people took vaccine, 44.82% didn't take vaccine and 26.19% didn't know whether they take vaccine or not. These results found because of lack of health education, poverty, illiteracy and lack of hepatitis B vaccination among slum people.

One study conducted in Sirajdikhan upazila of Munshiganj District on rural people of 30 respondents that Knowledge about taking HBV vaccination is very little among the study population. Majorities (76.7%) were unknown regarding taking HBV vaccination and the rest (23.3%) respondents were familiar with it. Nobody gave positive answer regarding taking vaccine (100.0%). Almost all respondents (96.7%) were unknown about the treatment of HBV infection. It has been well established that the primary source of information was through family, friends and neighbors regarding the gathering the knowledge of HBV infection (Nahar and Mimi, 2013).

The present study showed that 38.31% confirmed that they have the Hepatitis B patient in their family, where's 51.85% responded they their family is free from Hepatitis B and 9.84% population is not confirmed on the question.

In this study among the respondents of slum 75.75% supported that "Hepatitis B can be transmitted by unprotected sex". About 73.99% said Hepatitis B can be transmitted mother to

fetus, 73.64% marked sharing infected needles (73.64%) or syringe as a way of mode of transmission. Among the respondents 72.23% claimed “by blood transfusion hepatitis B can be transmitted”. Most slum people informed Hepatitis B can be transmitted by, medical or dental procedure (41.65%), razor sharing (49.03%) and Breast feeding (64.67%) respectively.

Leung et al., 2010 showed that regarding knowledge about the mode of transmission, mother-to-infant transmission and blood contact were recognized as risk factors by 67% and 65% of respondents, respectively. Transmission by sexual contact, sharing a razor or toothbrush, and tattooing or body piercing were appreciated by 44%, 41%, and 37% of respondents, respectively (Leung *et al.*, 2010).

A Study done among southeast Asians showed that majority of the participants knew that HBV can be transmitted during sexual intercourse (71% of men, 68% of women), by sharing toothbrushes (67% of men, 77% of women), and by sharing razors (59% of men, 67% of women). Less than one-half knew that hepatitis B is not spread by eating food prepared by an infected person (46% of men, 27% of women), nor by coughing (39% of men, 25% of women). One-third of our respondents did not (Taylor *et al.*, 2017).

. Some of the slum people had misconception about mode of transmission of Hepatitis B, among them 34.27% confirmed by shaking hand Hepatitis B can be transmitted, Another 42.53% said by wearing clothes of patients can be transmitted, 44.29% respondents said by Mosquitoes bites can be transmitted, some said by sharing toilet (41.48%) with infected person Hepatitis B can be transmitted, and also swimming pools (17.75%).

Most of the population had better knowledge about control and prevention of Hepatitis B. About 65.00% population think use of condom and 57% think remaining faithful to single partner can prevent Hepatitis B transmission. About 66.78% respondents think that the transmission of Hepatitis B can be prevented by avoiding needle share. According to 60.28% responds, knowledge and education is important for control and prevention of Hepatitis B.

We have noticed that most of the slum people had positive attitude towards Hepatitis B infected person in term of taking care, continuing relationship and buying food.

Conclusion

Hepatitis B virus remains a major cause of morbidity and mortality in Bangladesh and we have a long way to go before we may bid farewell to this deadly menace. In our country the incidence of diseases caused by hepatitis b, is increasing. Knowledge of Hepatitis B virus among the slum dwellers is not satisfactory. Most of the respondents did not take vaccine which may increase the degree of infection. Proper vaccination can decrease the number of infection. The dwellers don't have sufficient knowledge about the mode of transmission. By increasing the knowledge about the mode of transmission may decrease the incidence and intensity of the disease. Different types of program on Hepatitis B, arranged by NGO's can increase the level of knowledge and awareness. Government and different health related organization should take necessary steps to increase knowledge and awareness about Hepatitis B virus and its infection.

Chapter 6

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