



# A REVIEW ON HEPATITIS -B VIRUS

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Running title: **A COMPREHENSIVE REVIEW ON HEPATITIS -B VIRUS**

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## ABSTRACT:

Hepatitis is a disease which mainly occur due to inflammation of liver. There are two types of hepatitis acute hepatitis and chronic hepatitis . In the world most of the people are suffering from hepatitis -B virus. This virus is caused by an virus called “ORTHOHEPANA VIRUS”. The virus occurs mainly due to unsanitary condition, illegal affairs, transmission of hepatitis from mother to child through breast milk feeding. The virus particles mainly m-RNA is converted into ds-DNA through reverse transcriptase .the main symptoms observed here is enhancing body temperature, dark urine, nausea ,abdominal pain, vomiting . to overcome the above problem we can use both ayurvedic and allopathic medicines to cure the Hepatitis -B virus.

**KEY WORDS:** Acute hepatitis, Chronic hepatitis, Orthohepana virus, hepatitis B Surface Antigen ,liver damage , CD<sub>8</sub> T Cells, Anti HBeAg , ayurvedic drugs, allopathic drugs.

## INTRODUCTION:

The most common disease spread around the world wide is Hepatitis B disease [1] . Hepatitis B are most commonly seen at African countries[2]. On the basis of WHO report nearly 2 billion people will suffering from this disease worldwide[3]. according to global health sector strategy to completely eradicate the hepatitis b virus by 2030 [4]. It is a viral type of disease [5]. The hepatitis b virus consists of 2 types acute and chronic type of infection [6]. hepatitis b virus mainly infected in liver [7]. Acute hepatitis can be present in our body from few days to weeks and chronic hepatitis present in our body more than 6 weeks [8]. Before doing design, formulation and treatment of this disease it important to know about structure of the liver and its functions [9]. Some novel strategies like immune modulators, antiviral ,nucleotide analogues, interferon alfa -A ,pegylated interferons are some of the approved drugs which are used in the treatment of

hepatitis b [10]. environmentally available fruits and descendant from insects are helpful for the treatment of hepatitis b[11,12,13].

### **MODE OF TRANSMISSION:**

By coming into contact with contaminated secretions from the body or blood, the virus is spread. Hepatitis B is commonly found through interaction with another person's blood or near the point of birth in areas where the viral infection is wide spread. the most common method of infection in regions where the illness are spread widely by parenteral use, sharing houses with infected individual, visiting Nations with high diseased rate and sexually transmitted disease cases [14]. the Hepatitis containing virus can survive on external surface greater than 22 days at a temperature of 37 degree Celsius [15]. During vertical transmission condition the virus is spread directly from mother to developing foetus[16]. horizontal transmission condition this refers to the spread of Hepatitis B via intercourse or contact with mucus regions. in regions with low to moderate prevalence, sexual contact without protection and intravenous drugs use are the main methods of transmission [17].

### **VIROLOGY:**

Small flexible and enclosed ring like DNA genome that carries HBV virus which is halfly double standard belongs to the family **Hepadnaviridae** [18,19,20,21]. **ORTHOHEPANAVIRUS** most commonly seen in humans who infected with hepatitis and **AVIHEPADNAVIRUS** are most commonly seen in infected birds who contaminated with hepatitis B virus [22]. The surface of lipid double layer contains **HEPATITIS B SURFACE ANTIGEN** [23]. this is surrounded by nucleocapsid core and internal structure it contains DNA [24]. This virus also contains HBV DNA polymerase[25].

### **MECHANISM OF HEPATOTOXICITY:**

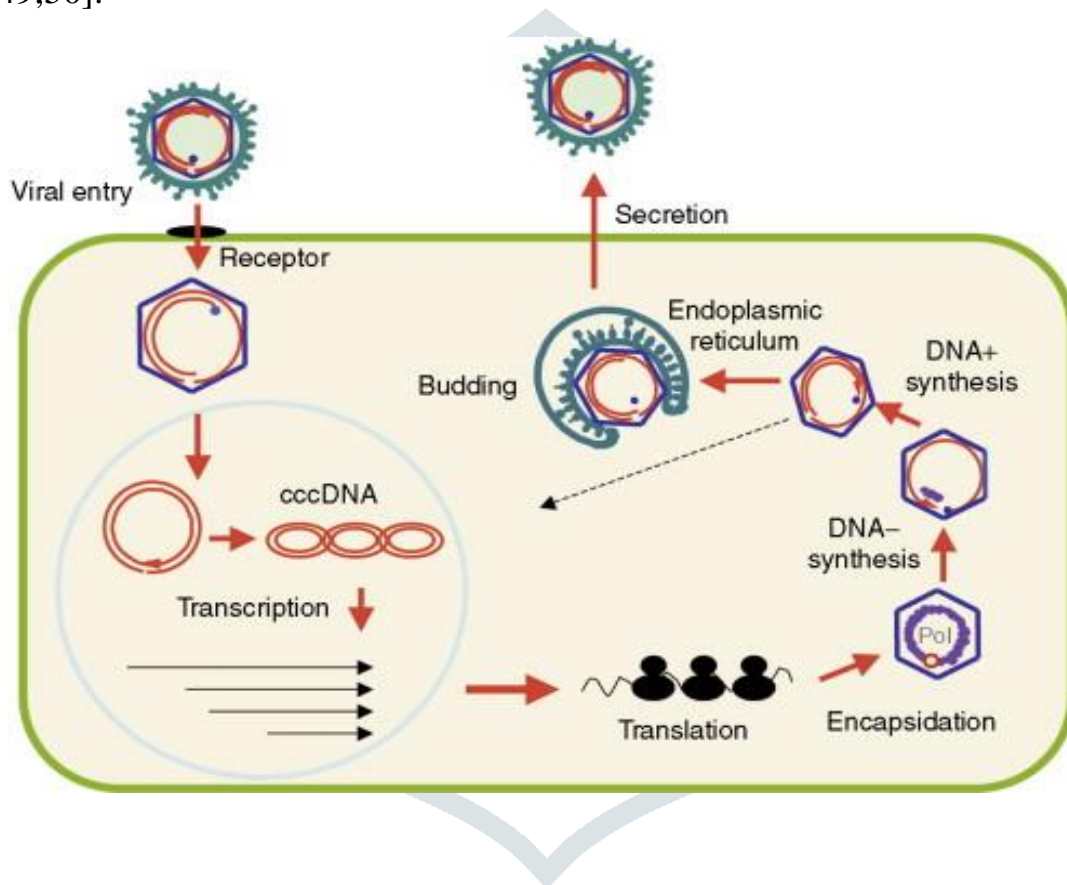
In liver mitochondria is present which act as function unit of the cell and produces various toxins and oxidising agents which leads to liver cells damage [26]. the liver is connected to the bile duct in this bile juice will be present inside bile salts will be present leads to liver injury[27]. When drugs reacted with chemical substances in our body and produces some toxic products this products binds with some larger molecules leads to damage in lipids, DNA, proteins and causes liver damage[28,29]. Excessive use of liquor and smoke causes liver injury[30,31]. when excessive ethanol consumption leads to enhanced level of S-adenosyl homocysteine leads to toxicity in liver [32,33,34]. manufacturing product wastes will also causes hepatic damage [35]. some waste water species which also causes liver toxicity in rats[36].

### **PATHOGENESIS:**

The etiology of hepatic toxicity critically depends upon CD8 cells response which are present on hepatitis B viral patients. These CD8 T cells is responsible to cure the liver toxicity [37,38,39,40]. When there is enhanced level of ALT we found that HBV DNA in the serum of hepatitis B patients[41,42,43]. When there is enhanced level of HBeAg inside of the virion particles and there is enhanced level of anti HBeAg for transfusion reaction [44]. Enhanced level of IFN-ALPHA and IFN-8 causes enhanced level of NK cells causes hepatic toxicity [45].

## LIFE CYCLE OF HEPATITIS B VIRUS:

HBV virion first attaches to the heparin sulphate proteoglycan due to weak attachment the virion later attached to NTCP antigens which are present on the surface of the cell membrane liver [46,47]. After binding the virion undergoes engulfment and release nucleocapsid into the cytoplasm of the liver cell [48].the nucleocapsid enters into the nucleus via nuclear pore and partially ds-DNA is converted into fully ds-DNA and then converted into CCC -DNA(covalently closed circular DNA) and further it is converted into 4 viral mRNA replications . The longest mRNA, which is utilised to transcribe the viral RNA-dependent DNA polymerase, for the formation of nucleocapsid core protein, and genome. All 4 retroviruses genes go through additional processing to generate offspring viral genome, which are either discharged from the cell or cycled back to the nucleus to make new copies of the virus . The viral particles P protein uses its reverse transcriptase ability to create DNA after returning the lengthy mRNA to the cytoplasm.[49,50].



## SYMPTOMS:

Enhanced body heat, enhanced heart rate, body aches [51,52]. Itchiness in the body , cough and weakness[53]. Yellow urine , puking sensation ,stomach ache [54].

## DIAGNOSTIC TESTS:

ELISA, RIA ,polymerase chain reaction tests ,enzyme linked immunoassay test, chemiluminescence microparticle immune assay test are some of the tests used in diagnostic process of hepatitis B virus detection [55,56,57]

## TREATMENT GIVEN BY ALLOPATHIC AND AYURVEDIC MEDICINES :

The medications which are prepared by Jamun and piper longum containing herbal extract is used in the treatment of liver toxicity by decreasing lipid peroxidation [58,59]. madhu generated

by honey bees, in this special type of honey bee like MAKSIKA generating madhu if taken 15 ml along with 120 ml ADHATHODA VASICA if consumed 2 times a day used in the treatment of jaundice[60]. DHANWANATARIGRASTA enhanced levels of galactosamine causes decrease in hepatic injury [61]. The drugs act against virus and specific antibodies like MAB which containing virus killing property used in the treatment of hepatitis B virus [62,63]. Some of the viral killing drugs like lamivudine, tenofovir, entecavir etc., are act as primary viral drugs used in the treatment of hepatitis B disease[64]. PEGylated interferon category drugs which are used intravenously at once in a seven days [65].

### PREVENTION:

In case of pregnant women the tenofovir drug are used during 2 and 3 trimester [66]. HBV vaccine act as one of the dose given after the child birth [67].

### CONCLUSION:

Elimination of hepatitis B virus are very important because long term sustainability of HBV in our body causes death of the patients. Many ayurvedic and allopathic drugs are used for treatment of Hepatitis B virus. The people are most interested towards allopathic drugs due to faster response and ayurvedic drugs are also useful for the treatment of HBV and it have less side effects. Most of the threatful diseases are treated by ayurvedic medicines. This reported review discusses about both ayurvedic and allopathic drugs are useful in the treatment of Hepatitis B virus.

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