

HEPATITES VIRUS

The background features several flowing, ribbon-like shapes in vibrant colors: red, orange, yellow, green, and blue. These ribbons curve and overlap, creating a sense of movement and depth against a solid black background. The lighting on the ribbons gives them a glossy, three-dimensional appearance.

VIRAL HEPATITIS

- It is inflammation of the liver and divided into 5 types:

Hepatitis A

Hepatitis B

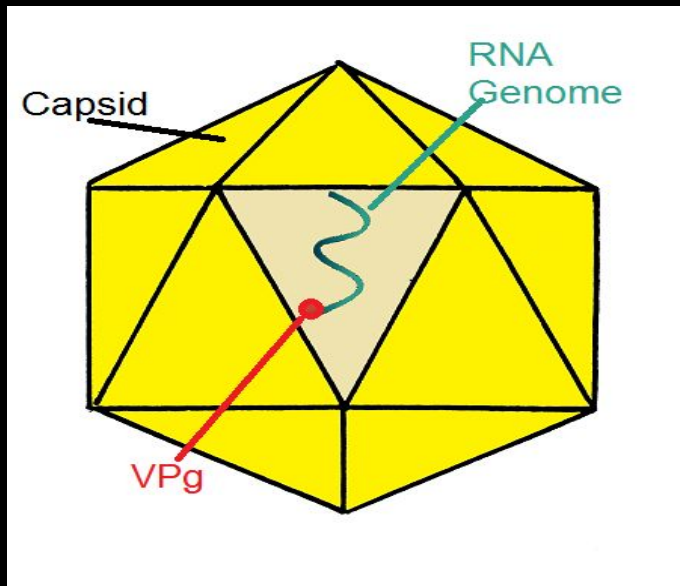
Hepatitis C

Hepatitis D

Hepatitis E

- Structure:
- The **nucleocapsid**, the core structure of all viruses, contains protein and nucleic acid
- The capsid of HAV is made up of subunits called **capsomeres** as shown in Figure 2. Each capsomere is made up of five protomers.

HEPATITIS A (HAV)



• Fig.1 Nucleocapsid

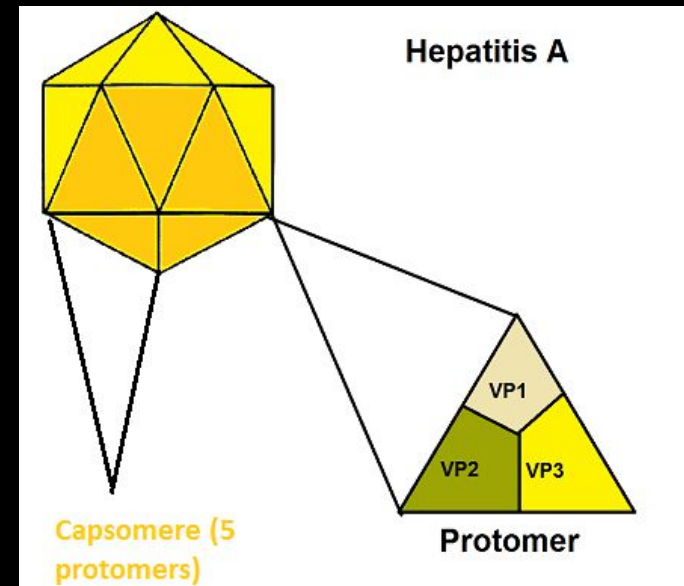


Fig.2 Capsid

EPIDEMIOLOGY

- Natural infection is seen only in humans but chimpanzees have been seen to catch the infection from humans and transmit it to humans
- It can be caused by contaminated food, water or milk
- Transmission is caused by fecal-oral route

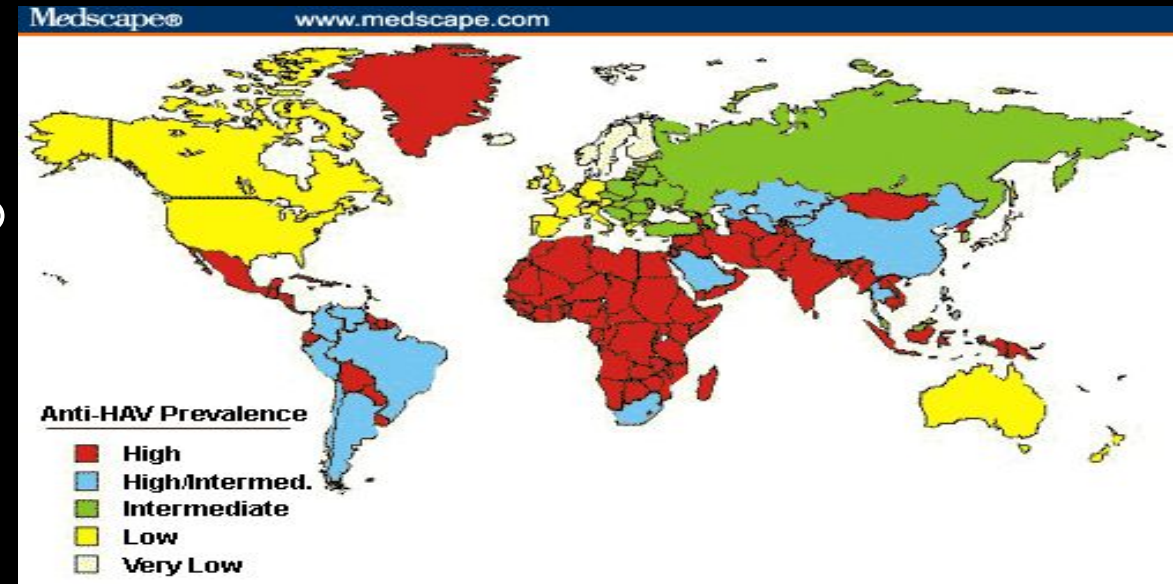


Fig.3

PREVENTION

- It can be prevented by vaccination good hygiene and sanitation
- Vaccines as: Havrix



Fig.4

TREATMENT

- There is no treatment
- Symptomatic treatment :
- Initial therapy often consists of bed rest. The patient should probably not work during the acute phase of the illness.
- Nausea and vomiting are treated with antiemetics. Dehydration may be managed with hospital admission and intravenous (IV) fluids. In most instances, hospitalization is unnecessary. The majority of children have minimal symptoms; adults are more likely to require more intensive care, including hospitalization.

SYMPTOMS

Symptoms can include:



Yellowing skin
and eyes



Dark urine



Light-colored
stools



Nausea and
vomiting



Loss of
appetite



Extreme
fatigue

DIAGNOSIS

- **Fortunately, blood tests are widely available to accurately diagnose hepatitis A, including tests for antibodies, or the affected person's immune response to hepatitis A proteins**
- HAV was first visualized in fecal extracts by electron microscopy using homologous antiserum ([80](#))
- Biochemical Diagnosis
- Enzyme Immunoassays (ELISA)
- Immunochromatographic Assay

HEPATITIS B (HBV)

- It the most spread and most important type of viral hepatitis
- Structure:

In the core of the virus is the genetic material, DNA, and the enzyme DNA polymerase, which are surrounded by a capsid (a protein shell). The entire virion (virus structure) is then surrounded by the envelope.

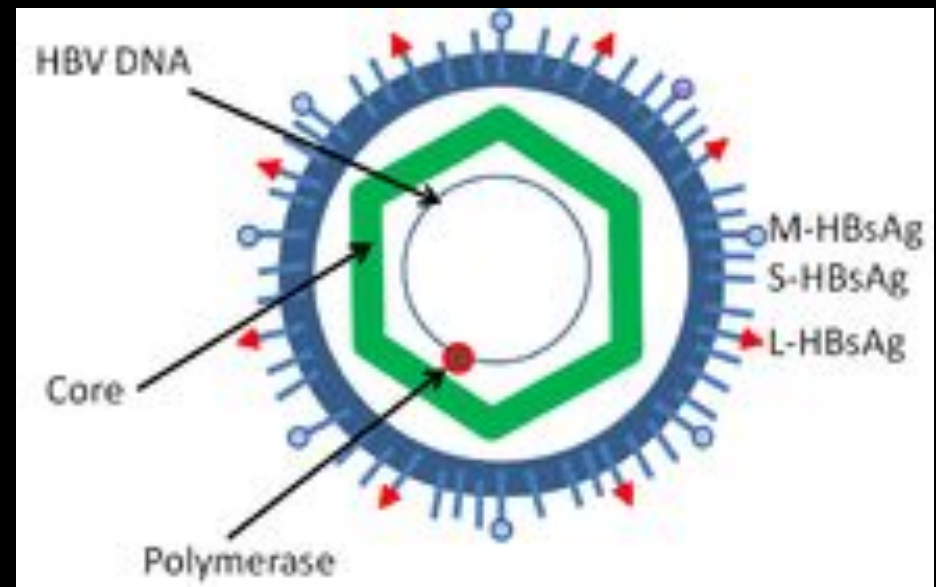
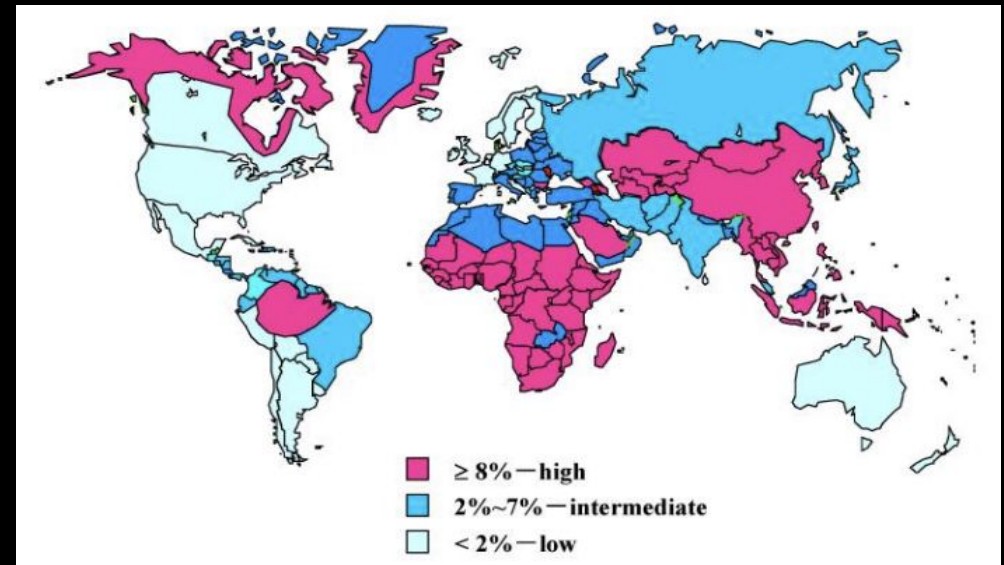


Fig.5 Virion

EPIDEMIOLOGY

- Natural infection occurs only in human, there is no animal reservoir
- Transmission :parenteral,sexual and perinatal
- It is transmitted through blood,saliva usage pf unsterile needles





PREVENTION

It can be prevented by :

Vaccination : Recombivax HB

Not sharing needles or toothbrushes

TREATMENT

- No specific antiviral treatment is available for acute hepatitis B

Synergistic approach of suppressing viral load and boosting the patient's immune response with immunotherapeutic interventions is needed for the best prognosis.^[3] The prevention of HCC often includes the use of antiviral treatment using pegylated interferon (PEG-IFN) or nucleos(t)ide analogues.^[1]

SYMPTOMS

Abdominal pain



Jaundice



Nausea/Vomiting



Swollen abdomen



Itchy skin



Weight loss





DISEASES

- Cirrhosis
- Liver cancer

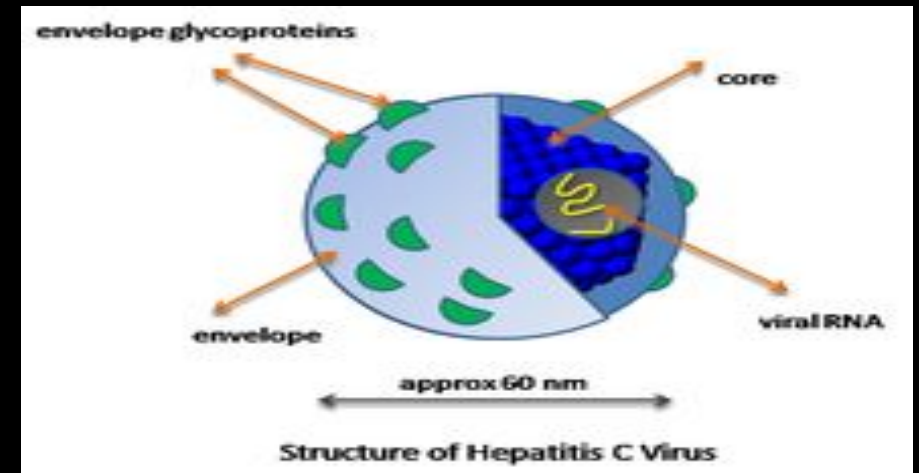
DIAGNOSIS

Laboratory diagnosis of HBV:

- Liver function tests, abnormally elevated (ALT and AST), bilirubin, alkaline phosphatase (ALP) and lactate dehydrogenase (LDH).
- The presence of HBs Ag confirms diagnosis, tested by ELISA, RIA and real PCR.
- Liver biopsy

HEPATITIS C

- Structure:
- The hepatitis C virus particle consists of a core of genetic material (RNA), surrounded by an icosahedral protective shell of protein, and further encased in a lipid (fatty) envelope of cellular origin. Two viral envelope glycoproteins, E1 and E2, are embedded in the lipid envelope.



SYMPTOMS

- Hepatitis C infection causes acute symptoms in 15% of cases. Symptoms are generally mild and vague, including a decreased appetite, fatigue, nausea, muscle or joint pains, and weight loss



PREVENTION

- There are no vaccines for prevention

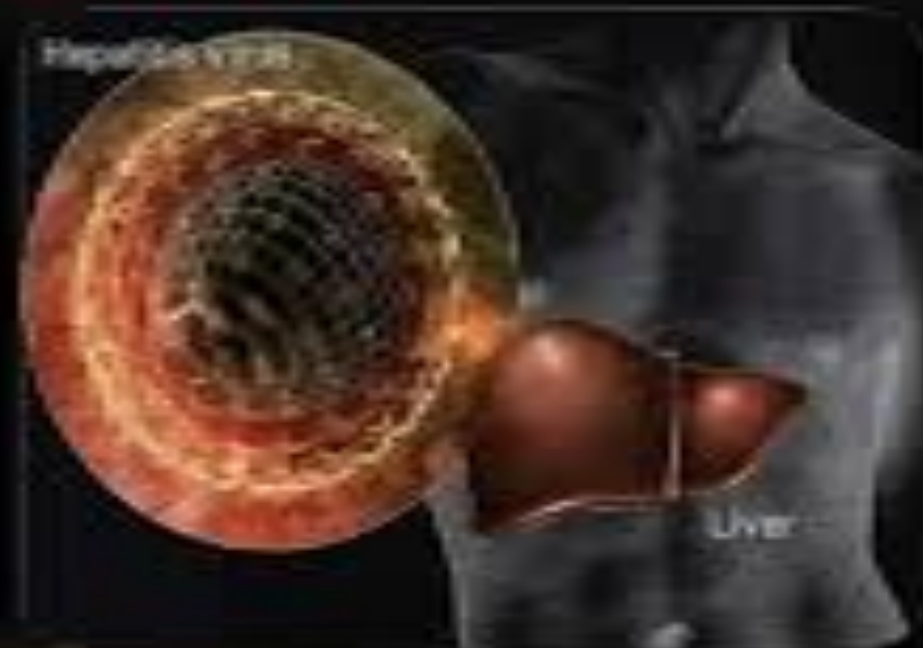
TREATMENT

- Long term infection can be treated by interferon alone or combined with ribavirin
- But short term(acute)infection cannot be treated because there are no symptoms
- Treatment with a combination of antiviral medicines can fight the viral infection and prevent serious liver problems like cirrhosis or liver cancer. They are used for 12 weeks to a year and help your body get rid of the virus.
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DIAGNOSIS

HOW IS HEPATITIS C DIAGNOSED?

- **Blood testing**
 1. Hepatitis C antibody test
 2. Hepatitis C PCR test to find virus in blood
- **Liver function tests**



HEPATITIS E

Morphology

- Hepatitis E virus is a nonenveloped, spherical particle, approximately 30 to 34 nm in diameter with an indefinite surface substructure that is slightly less pronounced than that of the Norwalk agent (a calicivirus), but distinguishable from the smooth, featureless surface of hepatitis A virus.
- On the basis of morphology, however, HEV cannot be reliably distinguished from other “small round viruses” found in feces.



PREVENTION

- Prevented by sanitation and vaccination

TREATMENT

- No treatment
- For people who have severe acute illness and who are not pregnant, treatment with the medication ribavirin for 21 days has resulted in improved liver function in some small studies.

SYMPTOMS

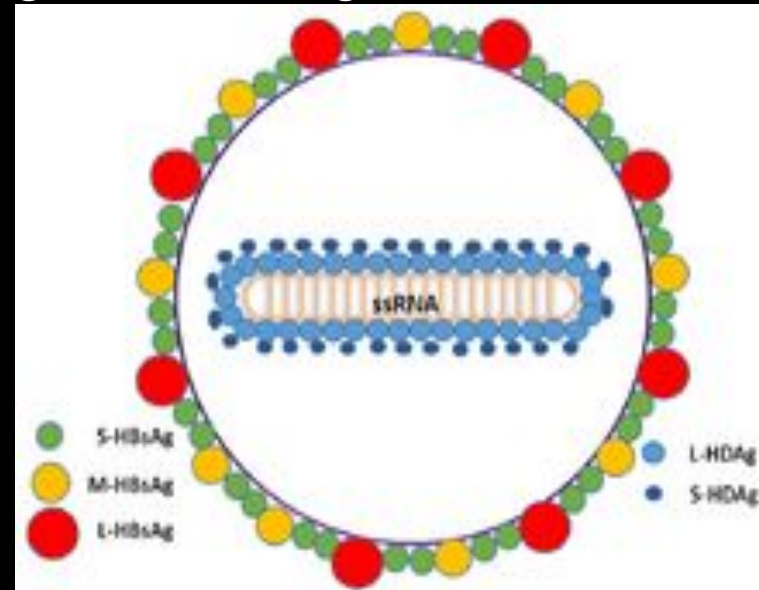
- Jaundice , fatigue, and nausea .

DIAGNOSIS

- EIISA

HEPATITIS D

- Structure: It has an outer coat containing three kinds of HBV envelope protein - large, medium, and small hepatitis B surface antigens - and host lipids surrounding an inner nucleocapsid. The nucleocapsid contains single-stranded, circular RNA of 1679 nucleotides and about 200 molecules of hepatitis D antigen (HDAg) for each genome. The central region of HDAg has been shown to bind RNA





PREVENTION

- Same vaccine used to treat hepatitis B

TREATMENT

- No treatment
- The drug myrcludex B, which inhibits virus entry into hepatocytes, is in clinical trials as of October 2015

SYMPTOMS

- Hepatitis D doesn't always cause symptoms. When symptoms do occur, they often include:
- yellowing of the skin and eyes, which is called jaundice
- joint pain
- abdominal pain
- vomiting
- loss of appetite
- dark urine
- fatigue

DISGNOSIS

- Blood test
- Liver function test
- ELISA