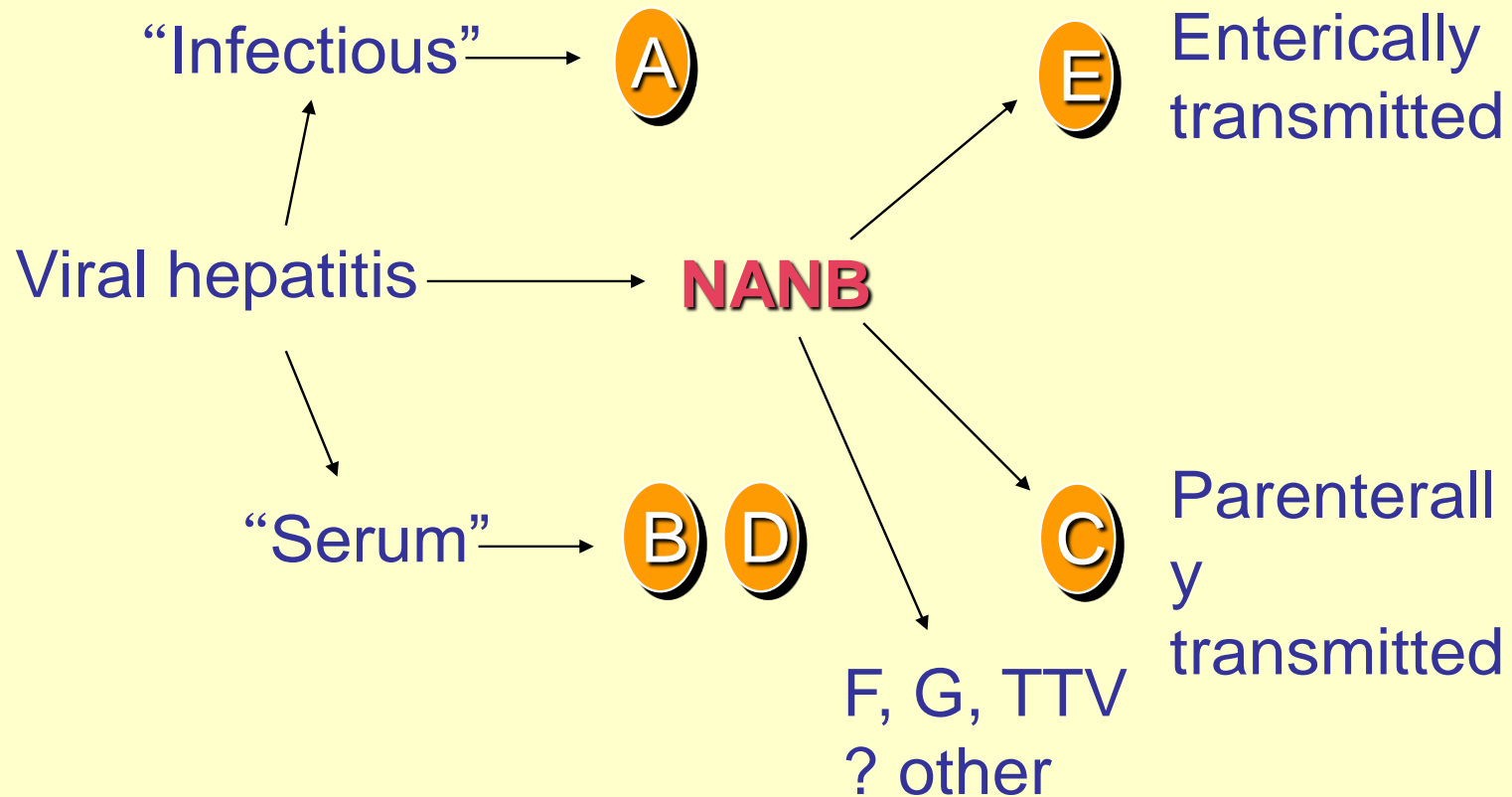


# Hepatitis A & Hepatitis E

## Dr Alpana Wagh

# Viral Hepatitis - Historical Perspectives



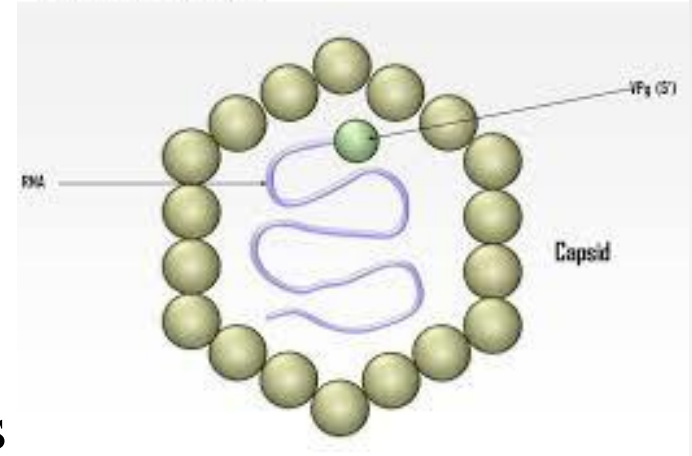
# Viral Hepatitis

- Primary inflammation of liver
- Hepatitis A more common, acute
- Transmitted by feco-oral route.
- Hepatitis B and C is more severe.
- Associated with hepatocellular carcinoma
- Hepatitis D requires association of HBV to cause infection.
- Hepatitis E causes icteric hepatitis & it spreads via feco-oral route.

# HEPATITIS A

Hepatitis A virus

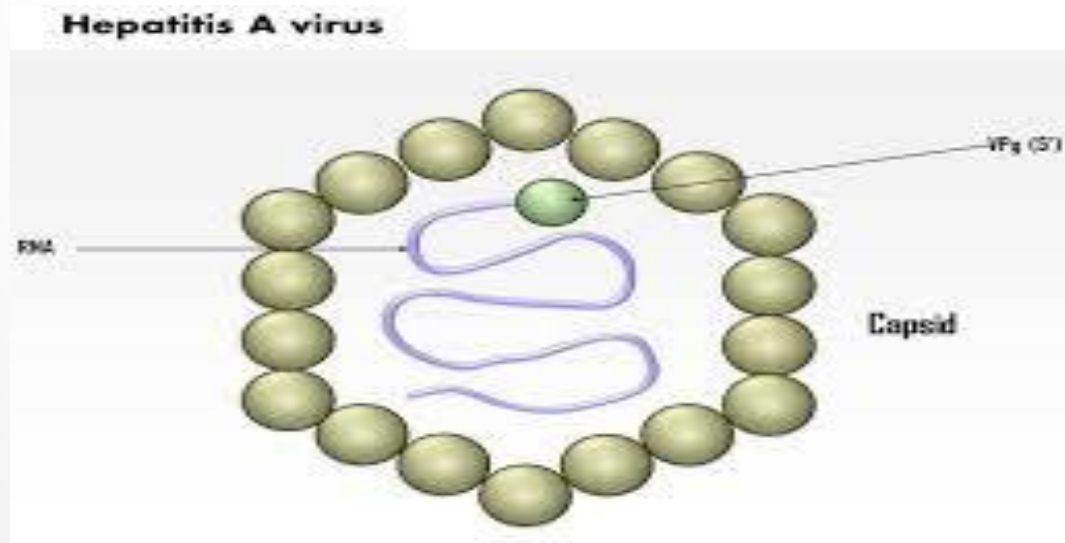
- Belongs to Picornaviridae.
- Morphology:
- RNA virus, Picorna family.
- Only one serotype
- 27 nm, spherical , nonenveloped virus
- Resistant to heat 60°C for 1 hour, ether(20%), **acid** at pH 3
- Inactivated by boiling for 5 min and treatment with chlorine(10-15 ppm),autoclaving, by UV rays or treatment with formalin.



# HEPATITIS A

Mode of transmission:

- Feco-oral route(common)
- Sexually(oro-anal contact in homosexuals.rare
- Parenterally (Through contaminated blood products )



# Epidemiology

- **Host:** Humans are the only host
- **Age:** Children and adolescents (5-14 years of age) are commonly affected, majority remains subclinical (80-95%). but excrete virus in longer time. Adults are more icteric (75-90%) than children with higher mortality rate. anicteric To icteric cases ratio:
- In Children: 12:1, Adults: 1:3
- **Risk factors:** Overcrowding, poor sanitation, lack of personal hygiene, summer camps, Military barracks, neonatal ICUs, day care centres.

# HEPATITIS A

- Ingestion of :

**Contaminated foods-milk**, water, raw vegetables, salad, frozen strawberries, green onions ,raw shell fish.

Incidence peaks towards the rainy season

Virus excretion in feces may be 2 weeks before and 2 weeks after the appearance of jaundice.

# HEPATITIS A

- Common in children
- By the age of 10 years, 90% population posses get exposed to subclinical infection and develop antibody to it.



# HEPATITIS A

I.P.-15-45 days.

- Pre Icteric Phase: nausea ,vomiting
- Icteric Phase:
  - ✓ dark coloured urine
  - ✓ yellowing of sclera and mucous membrane.

Complete recovery takes place in almost 98% cases

# Complications

Fulminant hepatitis: severe necrosis of hepatocytes.

Relapsing hepatitis: may develop weeks or months after recovery from active hepatitis.

Cholestatic hepatitis: protracted cholestatic jaundice and pruritus.

# Laboratory diagnosis

Anti HAV antibody detection:

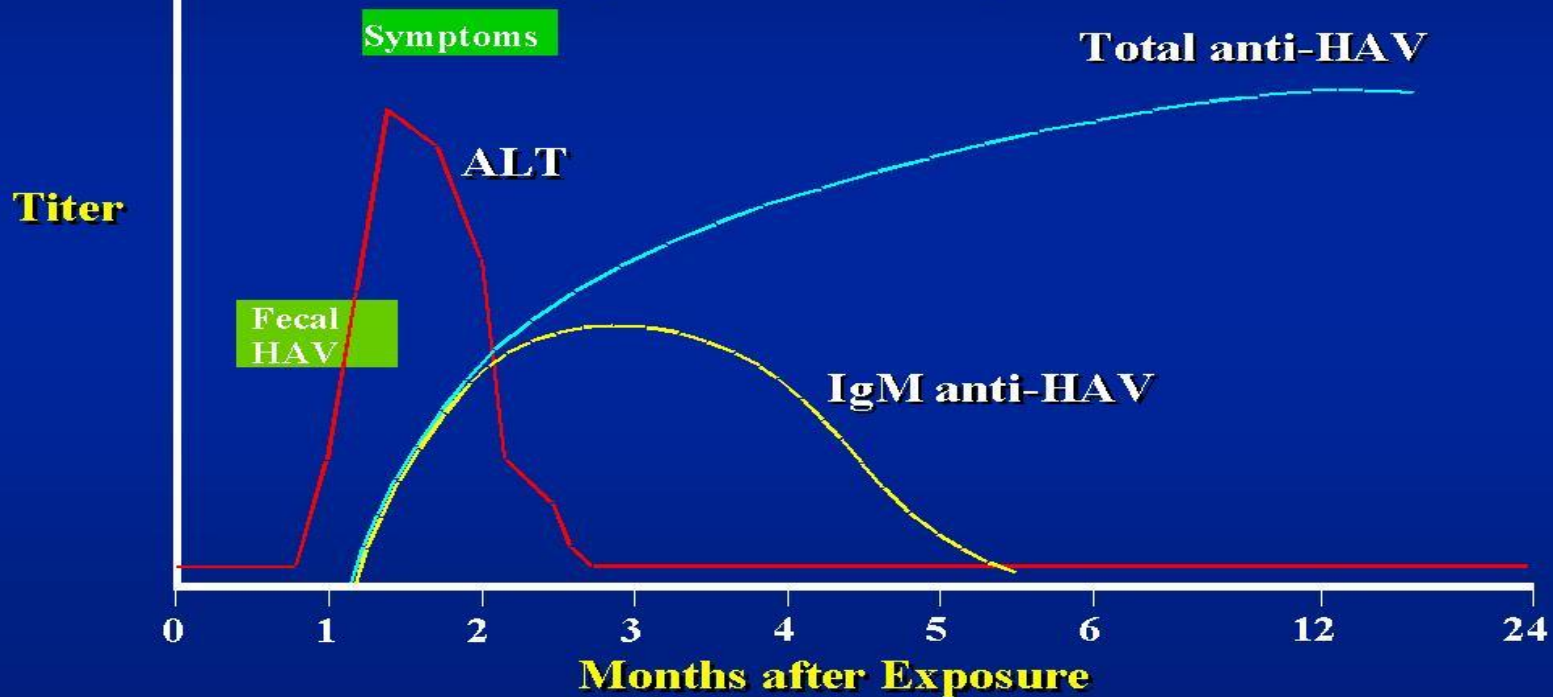
- ✓ IgM Antibodies appear during the acute phase peak about 2 weeks after the elevation of liver enzymes and disappear within 3-6 months.
- ✓ IgG antibodies appear a week after the appearance of IgM and persists for decades.
- ✓ Anti HAV IgM : Acute infection
- ✓ Anti HAV IgG: Past infection

Detection of these antibodies can be both by ELISA as well as rapid tests.

HAV antigen detection can be also done by ELISA test within-2 to 2 days of jaundice.

# Laboratory diagnosis

## Hepatitis A Virus Infection Typical Serologic Course



# Laboratory diagnosis

- Detection of HAV particles :from stool from -2 to +2 weeks of jaundice.by electron microscopy.
- Polymerase Chain reaction
- Elevated serum transaminases and serum bilirubin also co-relate.

# Treatment & Prevention

- No specific antiviral treatment available for Hepatitis A. Medically managed like jaundice.
- ❖ General preventive measures to improve hygiene:
  - ❖ Handwash before and after using toilet.
  - ❖ Sanitary disposal of infected fecal material.
  - ❖ Adequate water treatment by chlorination/boiling prior to consumption.

# Vaccines

- **Formaldehyde inactivated vaccines:**
  - ✓ prepared from human fetal lung fibroblast cell line such as MRC-5 and WI-38 given to children after 12 months of age.
- **Live attenuated vaccine:**
  - ✓ Subcutaneously given single dose
  - ✓ H2 and L-A-1 strains of HAV prepared from human diploid cell line.

Both vaccines are

- immunogenic .
- Long lasting immunity

# Human immunoglobulin

- Post exposure prophylaxis of intimate contacts(household, day care centres )of persons with hepatitis A with travellers.
- ✓ Dosage:0.02 ml/kg given as early as possible (within 2 weeks of exposure) gives protection for 1-2 months.
- ✓ Not recommended for vaccinated persons.



# Hepatitis E

- Enterically transmitted hepatitis
- Fulminant encephalopathy in pregnant women

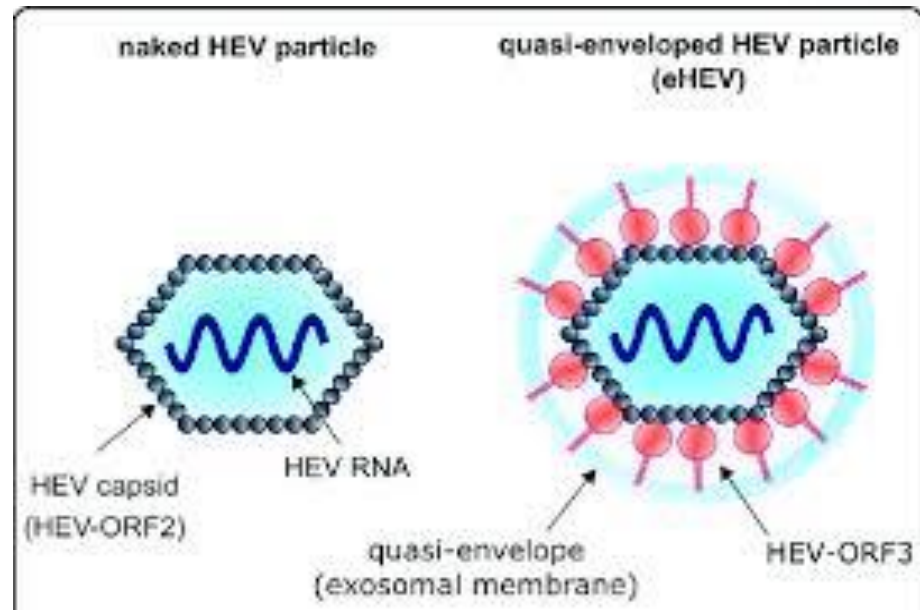
Morphology:

Small 32 nm sized

Nonenveloped

Icosahedral symmetry

Positive sense ssRNA



# Hepatitis E

## Transmission

- The global distribution of HEV has distinct epidemiological patterns based on ecology and socioeconomic factors.
- In resource-poor countries, disease presents as large-scale **waterborne epidemics (mostly sewage contamination)**.
- few epidemics have spread through **person-to-person contact**; however, endemic diseases within these countries can potentially spread through **person-to-person contact or fecally contaminated water and foods**.
- Vertical transmission of HEV from **infected mother to fetus** causes high fetal and perinatal mortality.
- Other means of transmission, such as zoonotic transmission, can fluctuate depending upon the region and strain of the virus.

# Difference between Hep A/Hep E

Though clinical picture resembles

- ❖ Secondary attack rate is higher for Hepatitis A(10-20%) as compared to Hepatitis E(1-2%).
- ❖ Young adults (20-40%) are more involved in Hepatitis E as compared to Hepatitis A

# Hepatitis E

## Clinical manifestations

- IP:14-60 DAYS
- ✓ Self Limiting Acute Hepatitis Lasting For A Few Weeks followed by A complete recovery.
- ✓ Fulminant hepatitis \*1-2% cases
- ✓ However number shows an alarming rise of 20% pregnant women who are also predisposed to encephalopathy.
- ✓ No chronic infection or carrier state.

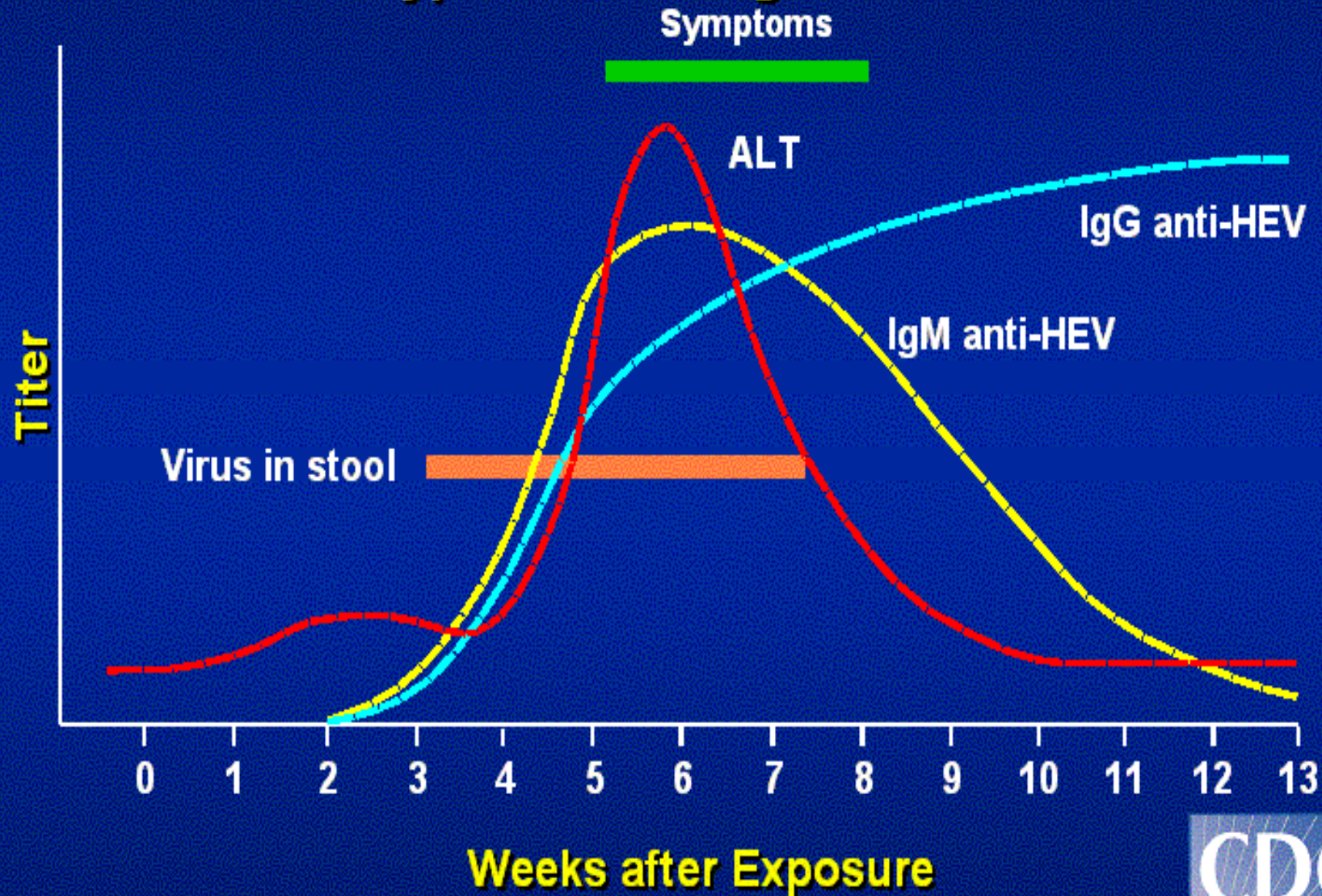
# Hepatitis E-Laboratory Diagnosis

- Ig M Anti HEV: appears in serum at the same time with appearance of liver enzymes-acute infection
- Ig G Anti HEV:replaces Ig M into 2-4 weeks and persists for many years-past infection.
- HEV RNA – REVERSE TRANSCRIPTASE PCR
- HEV virions-Electron microscopy.



# Hepatitis E Virus Infection

## Typical Serologic Course



# Treatment and Prevention

- No specific antiviral drug available.
- Prevention and Containment of infection are the same as Hepatitis A.

HEV 239 vaccine (using recombinant HEV Proteins) under clinical trials, not marketed yet.