

# *Viral Hepatitis*

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## Definition

Inflammation & damage to liver commonly by viruses, less commonly by other microorganisms (bacteria, leptospira)

# **Primary Hepatitis viruses**

(at least 5 -7 viruses)

- 1. HAV (Hepatitis A virus) - enterovirus 72
- 2. HBV (Hepatitis B virus) - Hepadnavirus
- 3. HCV (Hepatitis C virus) - Togavirus (Flavi  
viridae ss RNA)
- 4. HDV (Hepatitis D virus) - Small RNA virus  
(delta virus)
- 5. HEV (Hepatitis E virus) - Calici virus
- 6. HGV ( Hepatitis G virus ) - ?? (Flavi  
viridae) ss RNA env
- 7. TTV (TT virus) Parvo virus like?  
Linear ssDNA

# **Virus hepatitis may occur in variety of viral disease including infections with.**

- EBV
- HSV
- CMV
- Group B Coxachie virus
- Rubella
- Yellow fever

Cause hepatitis as part of disease syndrome.

# Viral hepatitis typically associated with,

## Prodromal symptoms

- Anorexia
  - Nausea
  - Vomiting
  - Fever
- Some cases Jaundice
  - Larger number of cases no jaundice

# *Hepatic damage in all cases,*

## Determined by

1. Biochemical tests of liver function
2. Histological examination of biopsy specimens

Rarely acute life threatening liver failure.  
(few patients)

Most patients → uninterrupted recovery

Regeneration of liver cells → rapid

Persistent damage → Fibrous repair

Leads to cirrhosis

Isolation of viruses → Not very successful

Lab animals → Not susceptible

# *Hepatitis caused by viruses*

- Cannot be distinguished clinically
- Dramatic elevation of serum amino - transferases
  - Alanine ↑ amino - transferase ( ALT )
  - Aspartate amino - transferase ( AST )
- Specific laboratory tests available for
  - A & B earlier.
  - All others ( C, D, E ) now
- Except in the case of A & B No vaccine
- Except in the case of B & C No specific treatment

# ***Hepatitis A (Infectious Hepatitis )***

## **Etiology**

- Picornaviridae : ss RNA
- Enteroviruses: Enterovirus 72  
or Hepatitis A virus
- Produce Sporadic & Epidemic infectious hepatitis.
- Only one serotype.
- No cross reactivity with HBV.

# *Transmission*

- Faecal oral route.
- Excrete  $10^8$  virus infectious doses per gram of faeces.
- Seldom by blood transfusions.

# *Stability*

- Stable to treatment with Ether  
Acid  
Heat  $60^0\text{ C}$ / 1hr
- Infectivity preserved for at least 1 month.  
Condition at dried  $25^0\text{ C}$   
& relative humidity 42%

## **Destroy**

- • Autoclaving 121<sup>0</sup>C/ 20 mins
- • Boiling in water 5 mins
- • Dry heat 180<sup>0</sup> / 1 hr
- • UV irradiation (1 mins at 1.1 Watt)
- • Treatment with formalin 1/4000 for 3 days at 37<sup>0</sup> C
- • Treatment with Chlorine 10 - 15 ppm/ 3 min

Relative resistance of HAV - demand extra precautions in dealing with hepatitis A patients & products.

## Spread & Sources

- Person to person
  - by contact (hands)
  - by contamination of food & water
  - (with faeces)
- Eating partially cooked muscles, oysters  
(harvested from human sewage )

## Person to person transmission

- Leads to out-breaks in School camps.  
Homes of mentally retarded persons
- Developed countries : 20 - 50% adults have infected ( have Ab )
- Developing countries : > 90 % adults have infected ( have Ab )
- Clinical disease with jaundice uncommon in
  - infants
  - Young children

Clinical disease with jaundice common in Adults & older children

## Clinical picture & pathogenesis

Infection

Virus replicate in GIT(unknown)

Enters blood → Viraemia

LIVER infect liver cells(No CPE) → damage to

Pass into Billiary tract

hepatocyte  
direct action

by

Intestine

Virus in faeces

# Common Clinical Manifestations

- Fever, anorexia, nausea, vomiting
- Sometimes jaundice, mortality <0.1%
- Illness more sudden onset than Hep.B
- No-chronic hepatitis, carrier state or cirrhosis
- No –Neoplasia
- Illness milder in infants and young children than in older children and adults
- Poor sanitation –infect early age/low socio economic condition.

# Lab diagnosis

- Best methods(ELISA)
- Detecting
- Hep A specific IgM in serum of convalescent patients
  - or demonstration of Ag in faeces (patients prior to onset of jaundice)  
primate cell culture/susceptible to HAV

# Hepatitis A Infection

- Incubation period 2-5wks
- Virus in faeces 1-2wks before symptoms towards the end of I.P.
- At the time of jaundice
  - Virus disappear in faece
  - IgM detectable
- IgM → Indicate recent infection positive up to 4-6month post infection
- IgG →
  - Detectable at the onset of symptoms
  - life long persistence.

## Treatment & prevention

Pooled normal Ig 1-2 months protection

Formaldehyde inactivated vaccine.

No antiviral therapy.