Acute Viral Hepatitis
INTRODUCTION

• **Hepatitis** = widespread damage to hepatocytes with inflammatory changes.

• **Acute hepatitis** = Result in limited or massive necrosis of the liver parenchyma resulting in liver failure.

• **Chronic hepatitis** = long standing inflammation and later replacement of liver parenchyma by fibrous tissue — Ultimately leading to cirrhosis.
TYPES OF HEPATITIS

TWO MAJOR GROUPS

1: Acute Hepatitis
   A: Infective
   B: Non-infective

2: Chronic Hepatitis
   A: Infective
   B: Non-infective
CAUSES OF ACUTE HEPATITIS

- **VIRAL**
  1. Hepatitis A virus
  2. Hepatitis B virus
  3. Hepatitis C virus
  4. Hepatitis D virus
  5. Hepatitis E virus
  6. Hepatitis G virus
  7. Cytomegalovirus, Epstein-Barr, Herpes Simplex, Yellow Fever viruses

- **Post viral infection** - Reye’s syndrome (Aspirin associated)

- **Non-Viral infections**
  Misc; Amoebic, other bacterial

- **Drugs**
  - Chloroquine, NSAID
  - Lamovudine, Zidovudine
  - Doxorubicin, Methotrexate

- **Poisons** (Mushrooms, Carbon tetrachloride)

- **Metabolic** (Wilson’s disease, fatty change in pregnancy)

- **Ischaemic** (CCF, Budd-Chiari syndrome)
CAUSES OF CHRONIC HEPATITIS

- **Viral** - B, C, D
- **Toxins** – Alcohol, Drugs
- **Biliary obstruction**
  1. Primary biliary cirrhosis
  2. Secondary biliary cirrhosis – stricture, stone, neoplasms
- **Metabolic diseases**
  1. Hemochromatosis – Primary and secondary
  2. Wilson’s disease
  3. Alpha-1 antitrypsin deficiency
- **Hepatic congestion**
  - Budd chiari syndrome, CCF,
- **Unknown** – Autoimmune, cryptogenic
VIRAL HEPATITIS – A REVIEW

Viral hepatitis needs detail discussion as

- It is responsible for more than 90% cases of both acute and chronic hepatitis
- Types A and E cause only acute hepatitis and spread by feco-oral route
- Types B, C and D cause both acute & chronic hepatitis and are transmitted by blood and blood products and body fluids
## Causes:

<table>
<thead>
<tr>
<th></th>
<th>Hepatitis A (HAV)</th>
<th>Hepatitis B (HBV) serum hepatitis</th>
<th>Hepatitis D (HDV) Post transfusion hepatitis</th>
<th>Hepatitis C (HCV)</th>
<th>Hepatitis E (HEV) Epidemic/Enteral</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>virus</strong></td>
<td>27 nm RNA</td>
<td>42 nm DNA</td>
<td>35 nm Incomplete RNA+HBsAg</td>
<td>30 – 60 nm RNA flavi virus</td>
<td>32 nm RNA</td>
</tr>
<tr>
<td><strong>transmission</strong></td>
<td>Feco-oral</td>
<td>☐ Paraental and post transfusion</td>
<td>☐ Sexual low risk 1-5 %</td>
<td>☐ Intrauterine low risk &lt;5%</td>
<td>Feco-oral</td>
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<tr>
<td><strong>Incubation p.</strong></td>
<td>2 – 6 weeks</td>
<td>2 – 6 months</td>
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<td>2 – 6 weeks</td>
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<tr>
<td><strong>Chronicity &amp; liver cancer</strong></td>
<td>no</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Immunization</strong></td>
<td>Non specific Ig</td>
<td>Specific Ig</td>
<td>IgM</td>
<td></td>
<td>Non specific Ig</td>
</tr>
<tr>
<td></td>
<td>HAV vaccine danger</td>
<td>Heptavax HBV vaccine</td>
<td>Heptavax HBV vaccine</td>
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Pathogenesis

• Initial viremia, with inflammation of GIT mucosa.

• Intrahepatic localization lead to
  – cellular edema & inspissation of bile
  – Diffuse necrosis
  – intrahepatic cholestasis

• Other organ:
  – Splenomegaly
  – Lymphoadenopathy
  – Hypoplasia of BM
Clinical picture

Pre-icteric stage or prodromal stage:
• 3 – 9 days
• Sudden onset of influenza like symptoms
• fever - headache – malaise – muscular pain
• Anorexia is marked with nausea – vomiting – distension
• Pain in Rt hypochondrium & epigastrium
• Dark urine – pale stool
• Transient itching

• Examination: fever with relative bradycardia + enlarged tender liver
Clinical picture

Icteric stage: 2-4 weeks

• Jaundice with fever
• Improvement of general condition
• Anorexia, nausea & vomiting diminish or disappear
• Urine is dark brown & frothy
• Stool are clay in color – bulky – offensive – greasy

Examination:
• Soft tender enlarged liver & Spleen is enlarged
• Gerelized lymphoadenopathy
Clinical picture

Recovery stage:

• Signs & symptoms gradually disappear
• Jaundice may persist for some times
  – due to affinity of bile pigment to elastic tissue
• Complete recovery of liver may take up to 6 months
Investigation:

• **L F T :**
  1. Serum Total, Direct & Indirect Bilirubin
  2. ALT = from 500 – 2000 IU/L
  3. AST = from 500 – 2000 IU/L (Non Specific) ALT > AST
  4. Alkaline phosphatase (Non Specific)
  5. 5’nucleotidase (specific for malignancy)
  6. GGT (specific for acute alcoholism)

• **Complete Blood Count:**
  • Leucopenia with relative lymphocytosis
• Urine:
  • Bile Pigment + ve
  • Bile salt: +ve
  • Urobilinogen:

• Stool:
  • Pale – clay with staeotorrhea (___________ jaundice)
  • Decrease Stercobilinogen

• Serology
HEPATITIS B PROFILE

After Acute infection of Hepatitis B Virus

- 1-2 days = HBsAg
- 3-4 days = Anti HBcAg antibody & HBeAg
- Anti HBcAg antibody remain longer period
- 4-5 days = Anti HBcAg antibody for 9-10\(^{th}\) day
- After 5-6 days = Anti HBsAg antibody
- Anti HBsAg antibody remain longer period
<table>
<thead>
<tr>
<th>Antigen</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
<td>HBsAg (surface)</td>
<td>- Appear after 6 weeks&lt;br&gt;- Acute infection, for 3 months&lt;br&gt;- Chronic infection if &gt;6 months</td>
</tr>
<tr>
<td>HBcAg (core)</td>
<td>- Detected on Liver Biopsy only&lt;br&gt;- Not serum</td>
</tr>
<tr>
<td>HBeAg</td>
<td>- Reflect ongoing viral replication (chronicity)</td>
</tr>
<tr>
<td>Anti HBs</td>
<td>- Appear after 3 months&lt;br&gt;- Reflecting recovery &amp; immunity</td>
</tr>
<tr>
<td>Anti HBc</td>
<td>- Appear after 2 months&lt;br&gt;- Reflecting severe acute &amp; chronic form</td>
</tr>
<tr>
<td>Anti HBe</td>
<td>- Appear after 2.5 months&lt;br&gt;- Non replicating virus</td>
</tr>
<tr>
<td>HBV DNA</td>
<td>- For viral replication &amp; chronicity</td>
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</table>
• Serological gap:

• Window Period of Several Week
  – Between Disappearing of HBs Ag & Appearance of Anti HbsAg Antibody

• Anti HBcAg Antibody may represent serological evidence of recent HBV infection

• Blood free from Hbs Ag & Anti Hbs (but containing anti – HBC) is the major cause of transfusion HBV infection
Course & Complication:

**Complete recovery:**
- Occur in most cases of virus A – E
- Less common in virus B – D
- Very less in virus C

**Relapse:**
- Characteristic of virus C – less common in B – D

**Fulminant hepatitis: (Acute liver failure)**
- Acute hepatic necrosis
- After typical onset
- Deep jaundice, Vomiting, Encephalopathy & Coma
- Patient usually dies in 10 days
Prolonged cholestasis

- Cholestatic jaundice
- After 3 Weeks of jaundice
- Condition improves but Deep jaundice
- Patients starts to itch
- This is due to intra hepatic Biliary obstruction by inflammation
- Jaundice persist to 6 months then recovery

Post hepatitis syndrome:

- Anxiety, fatigue, anorexia, Rt upper abdominal discomfort
- Palpable liver raised of diaphragm in X Ray
- LFT & biopsy are normal
Treatment

Rest
• Bed rest till LFT normal

Diet
• Plenty of Carbohydrate
• Enough Protein should be given, except with Liver failure
• Avoid Fats
• Alcohol & hepatotoxic drugs contraindicated
Drugs

• Dextrose Saline
• Antacid = Proton pump inhibitor
• Anti Emetic
• Multi vitamins – Vitamin-K
• Laxative
• Cholestyramine
• Corticosteroids = in fulminant Cholestatic jaundice
• Interferon = To reduce risk of chronic hepatitis in acute hepatitis C
Prophylaxis

- Screening of blood for Hepatitis Ag
- Disposable syringes
- Avoid sharing razors or tooth brush

**Passive prophylaxis:**

Hepatitis A

Hepatitis B: (HBIG) rich with anti HBs

**Active prophylaxis**

- Hepatitis A: Inactivated HAV to be repeated after 6 -12m
- Hepatitis B: Recombinant HBV vaccine (Heptavax) 3 doses ( 0 - 1 - 6 months and booster every 3 years )
High risk people

- Medical doctors & nurses
- Blood bank & Laboratory Technician
- Patients of
  - Hemophiliac
  - Thalassemia
  - Sickle cell anemia
- Drug abusers
- Babies born to HBsAg +ve mother
- HBV is prophylactic against hepatitis D viral infection
HEPATITIS -B

- **HBsAg**
  - appears in late and remains for up to 6 months.

- **Anti-HBs**
  - Confers immunity to HBV infection.
  - Appears after 3-6 months of acute infection & following vaccination.
  - In past infection, Anti HBsAg + Anti HBeAg both are present.
  - Post vaccination cases only Anti HBsAg is present.

- **HBeAg**
  - Indication of active viral replication
  - Indication of increased infectiousness.
  - It appears for a short time at the onset of the illness.
• **Anti HBeAg:**
  – Appears late in acute illness and indicate cessation of viral replication.

• **Anti-HBc IgM**
  – HBcAg does not appear in the blood.

• **Anti-HBc IgM + IgG**
  – Detectable after acute HBV infection.
  – Useful screen for past HBV infection.
  – This may be the only sign of infection in the window period.
Hepatitis B Spread

HBV is a **blood borne** and **sexually transmitted** pathogen that is spread through:

- Percutaneous and mucosal exposures to infected blood and body fluids,
- injection drug use,
- sexual intercourse with an infected partner,
- perinatal transmission from mother to child,
- chronic hemodialysis,
- **Tattooing** with shared, contaminated needles.
- HBV is **viable for at least 7 days on environmental surfaces**
- And can be transmitted by sharing contaminated household items such as razors and toothbrushes.
Hepatitis B - Prognosis

- **85-90%**
  - Eventually clear HBsAg from the blood
  - Develop antibodies to HBsAg (anti-HBs)
  - That confer long-term protection from re-infection.

- **10-15%**
  - Chronic HBV infection (HBsAg-positive for 6 months or longer).

- **5-10%**
  - Chronic HBV infection (HBsAg-positive)
  - Chronic hepatitis

- **1-5%**
  - Cirrhosis and Hepatocellular carcinoma
SEROLOGY IN ACUTE HBV INFECTION:

**Early illness**
- HBsAg
- Anti HBc (IgM)
- HBeAg

**Late illness**
- Anti HBsAg
- Anti HBcAg (IgG)
- HBeAg - indicate active viral replication
- Anti HbeAg - Indicate either low replication or viral clearance
- HBsAg for 6 months
Hepatitis B Treatment

1. No effective therapies
2. largely supportive.
3. Antiviral therapies for chronic hepatitis B include
   – interferon
   – adefovir dipivoxil
   – lamivudine.
Thank you