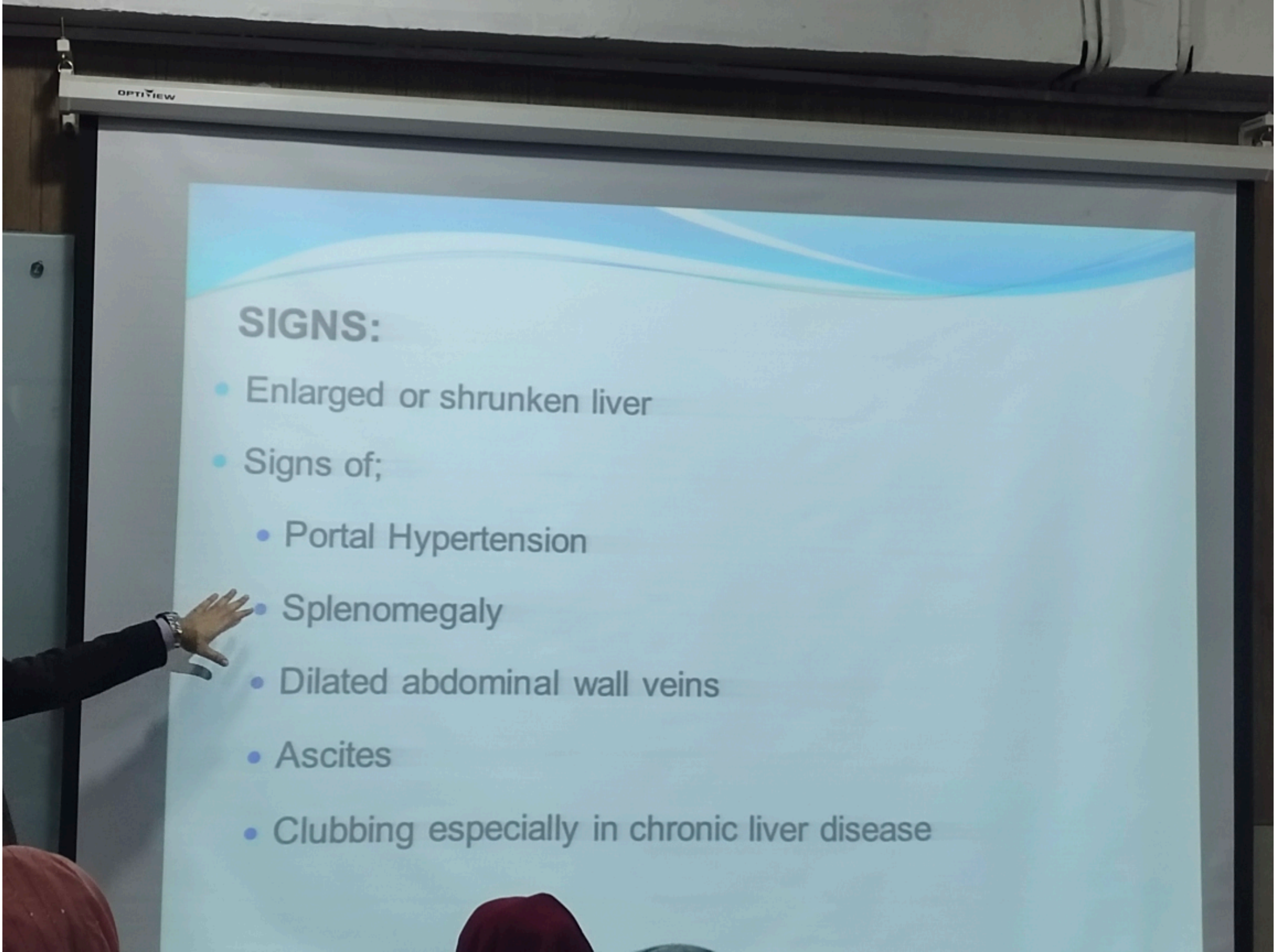
MANIFESTATIONS OF LIVER DISEASES

SYMPTOMS:

- Abdominal pain, anorexia, fever and vomiting in cases of hepatitis
- Jaundice with dark colored urine & pale stool.
- Abdominal distension; due to hepatomegaly.
- Bleeding tendency e.g. hematemesis, melena & epistaxis.
- Purities.
- Failure to thrive & malaise.
- Metabolic consequence of liver diseases e.g. encephalopathy


SIGNS:
Enlarged or shrunken liver
Signs of;
Portal Hypertension
Splenomegaly
Dilated abdominal wall veins
Ascites
Clubbing especially in chronic liver disease

INVESTIGATIONS OF LIVER DISEASES

LIVER FUNCTION TESTS:

Evidence of cellular injury: Assessed by SerumTransaminases:

- Alanine Aminotransferase (ALT) normal value is 5-45U/L
- Aspartate Transaminase (AST) normal value 15-55U/L
- They are increased in liver necrosis marked in acute hepatitis. ALT is a more sensitive indicator of liver damage.

II. Excretory function of the liver can be assessed by:

- **Bilirubin level:** Normally no bilirubin in urine

  It is present in Obstructive and Hepatocellular jaundice

- Urobilinogen in urine is increased in:

  -Hepatocelluar jaundice. -Hemolytic anemia.

- Increased S. gamma glutamyl transferase in obstructive jaundice.

- Decreased serum albumin level in liver cirrhosis.
- Elevated Serum immunoglobulins in chronic liver diseases.
- Delayed prothrombin time and concentration (normal value 10-13 seconds and 85%-100% respectively).

Imaging study of the liver:-

- Liver ultrasound it shows:
  - Diffuse liver disease; cirrhosis, metabolic disease, hepatic periportal bilharzial fibrosis and fatty liver.
  - Biliary channel patency, choledocal cyst and gall stones.
  - Focal lesions, liver abscess - Ascites and subphrenic abscess.

- Radioisotopic scanning it display liver size, morphology, focal lesions and biliary excretion.
- Computerized tomography (CT) it demonstrates the presence of focal lesion, and cyst.
- Magnetic resonance imaging (MRI) it can shows patency of biliary tree and focal lesion.
- Liver biopsy and histopathological examination, it is the key for diagnosis of most liver disease.

HEPATOMEGALY

DEFINITION:

It is an inflammatory process of the hepatocytes characterized by degeneration and regeneration with loss of hepatic architecture.

TYPES:

- Acute: Less than six months duration
- Chronic: More than six months

ETIOLOGY:

I- Infections, which may be:-

Viral:

- Hepatotropic viruses e.g A, B, C, D, E, F, G, H viruses
- Non -hepatotropic: infect the liver in the course of other systemic illness:

- Epstein-Barr virus (EBV). -Cytomegalovirus (CMV).
- Coxsakie, -ECHO, -rubella, -varicella and measles viruses.

BACTERIAL :

- As a part of generalized septicemia.
- Isolated pyaemic liver abscess. - Leptospirosis.

Protozoal: e.g amoebic hepatitis.

II- Drugs and Toxins:

- Anti T.B. e.g Isoniozid - antimetabolites - anticonvulsant:- valporic acid
- Irradiation - total parenteral nutrition

III- Immunological Disorders

-As apart of : S.L.E and J.R.A

- Isolated auto immune hepatitis

IV- Metabolic Causes:

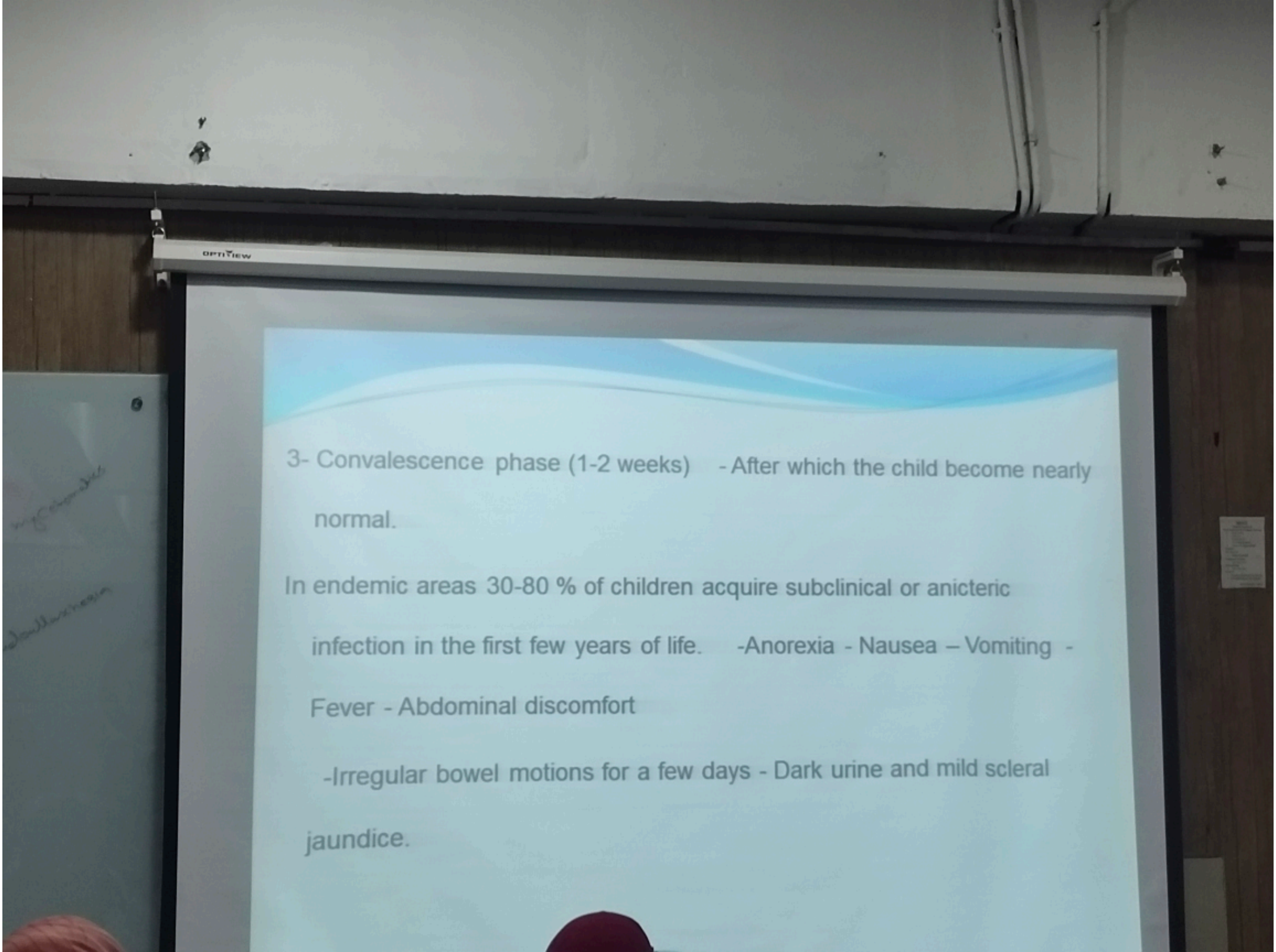
- Alpha antitrypsine deficiency - galactosemia - tyrosenemia
- Haemosidrosis - Wilson disease

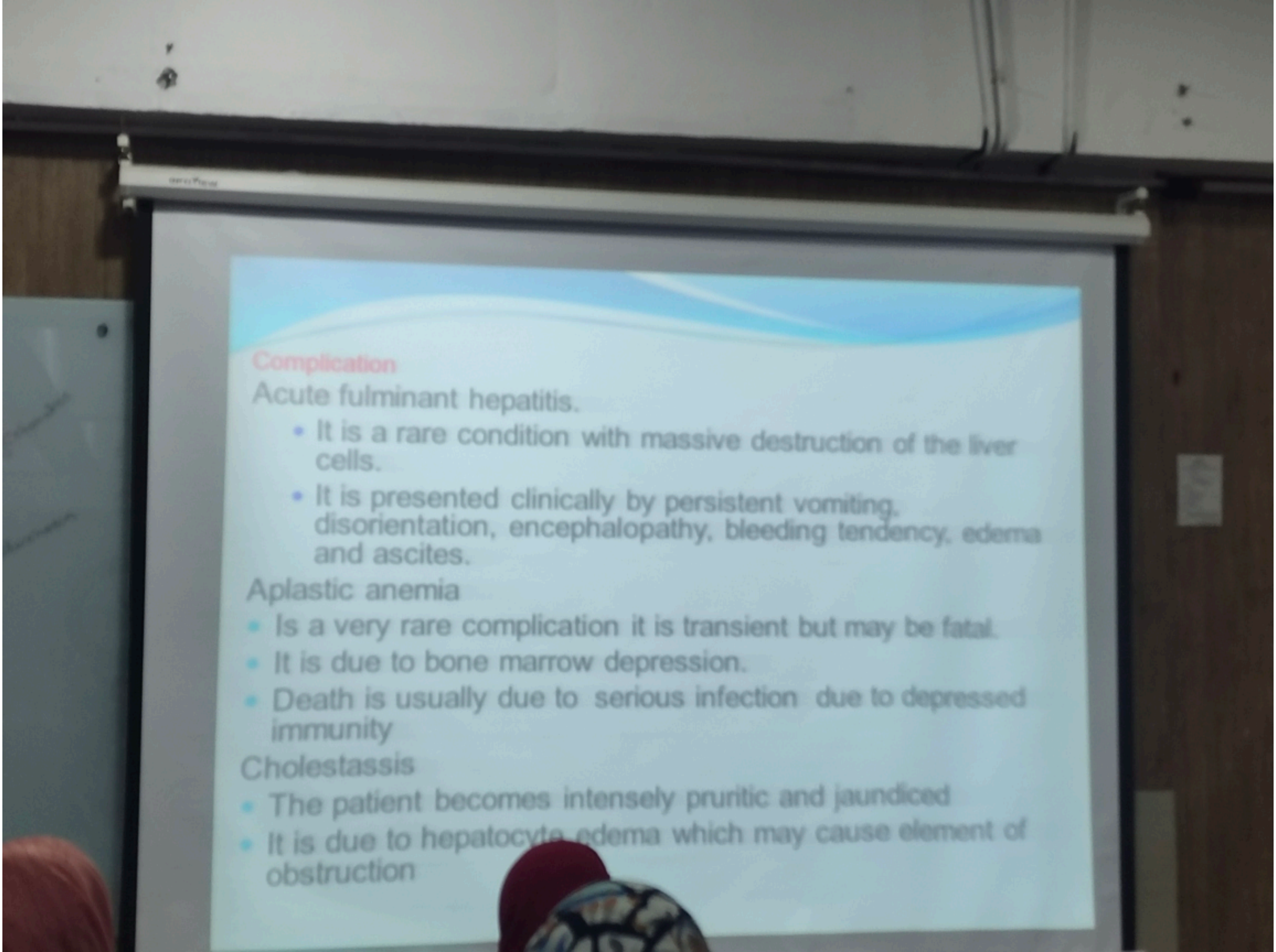
V- Vascular Causes

- Hepatic vein thrombosis. - Hepatic artery thrombosis

VI- Tumors:

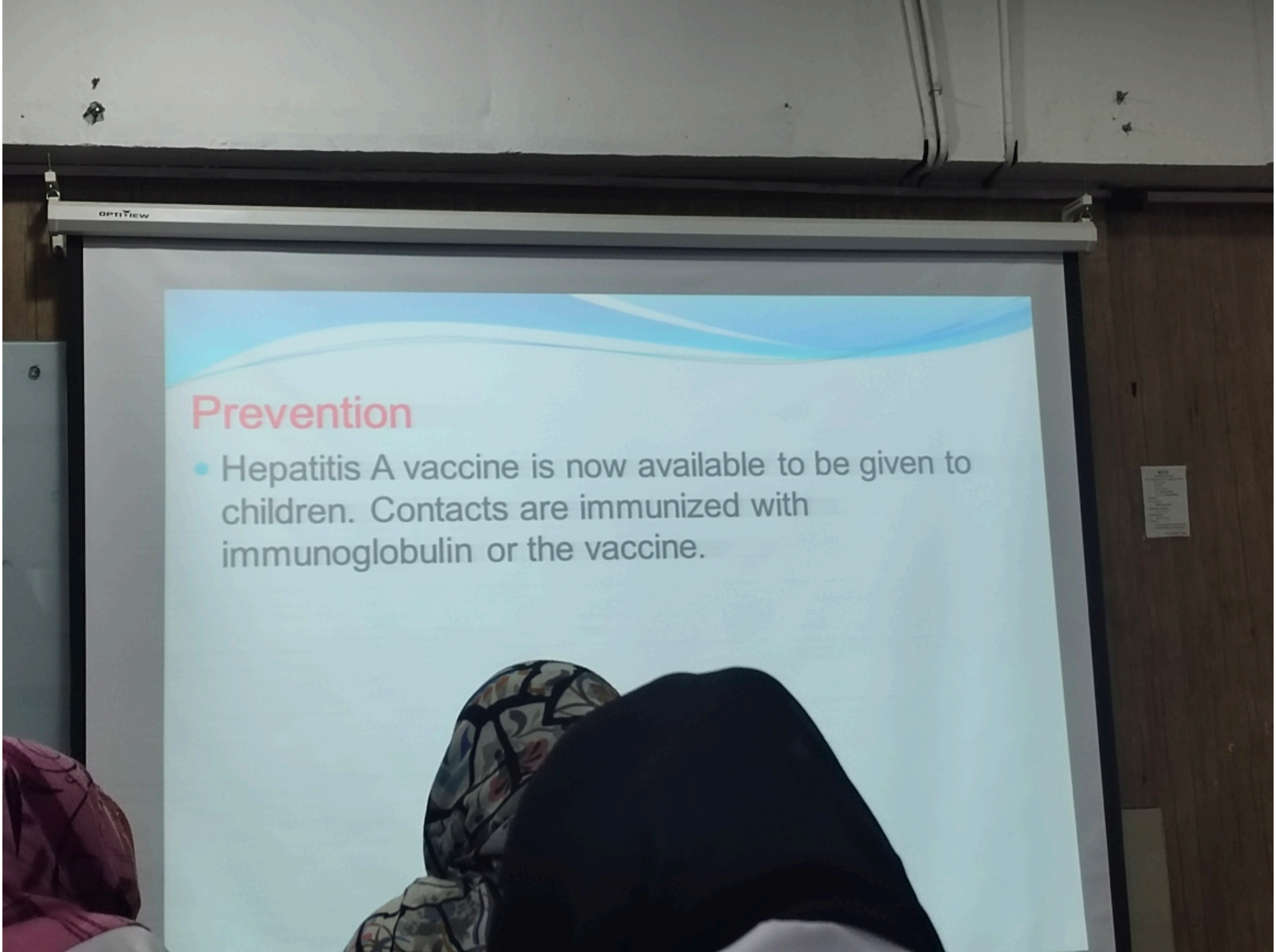
- Primary: hepatoma or hepatoblastoma
- Secondary:- ne stoma, lymphoma, leukemia


3- Convalescence phase (1-2 weeks) - After which the child become nearly normal.
In endemic areas 30-80 % of children acquire subclinical or anicteric infection in the first few years of life. -Anorexia - Nausea – Vomiting - Fever - Abdominal discomfort
-Irregular bowel motions for a few days - Dark urine and mild scleral jaundice.


Complication
Acute fulminant hepatitis.
• It is a rare condition with massive destruction of the liver cells.
• It is presented clinically by persistent vomiting, disorientation, encephalopathy, bleeding tendency, edema and ascites.
Aplastic anemia
• Is a very rare complication it is transient but may be fatal.
• It is due to bone marrow depression.
• Death is usually due to serious infection due to depressed immunity
Cholestassis
• The patient becomes intensely pruritic and jaundiced
• It is due to hepatocyte edema which may cause element of obstruction

Treatment

- There is no specific therapy for acute viral hepatitis,
- Most children are managed at home except if liver cell failure is suspected.
- Balanced diet with low fat intake should be given.


Prevention
Hepatitis A vaccine is now available to be given to children. Contacts are immunized with immunoglobulin or the vaccine.

HEPATITIS B

Mode of transmission

- Perinatal transmission (vertical transmission).

  -Infection appears to be due to contact with a mother's infected blood at the time of delivery. -Transplacental transmission is rare.

- Parenteral : In patient receiving blood transfusion or blood products, renal dialysis, dental care, and through contaminated syringe and needles.

Incubation period: (45-160 days).

Clinical manifestation: Asymptomatic carrier is more common.

- Acute infection presented with:
  - Jaundice, dark color urine, anorexia, nausea, malaise.
  - Hepatomegaly splenomegaly.
  - Exctrahepatic manifestations as:

Papular skin eruption - Arthralgia– Glomerulonephritis. -Aplastic anemia – Polyarthritis.

- Chronic hepatitis may present with: - Chronic active hepatitis. - Cirrhosis.
- Hepatocellar carcinoma in adult.

Laboratory diagnosis

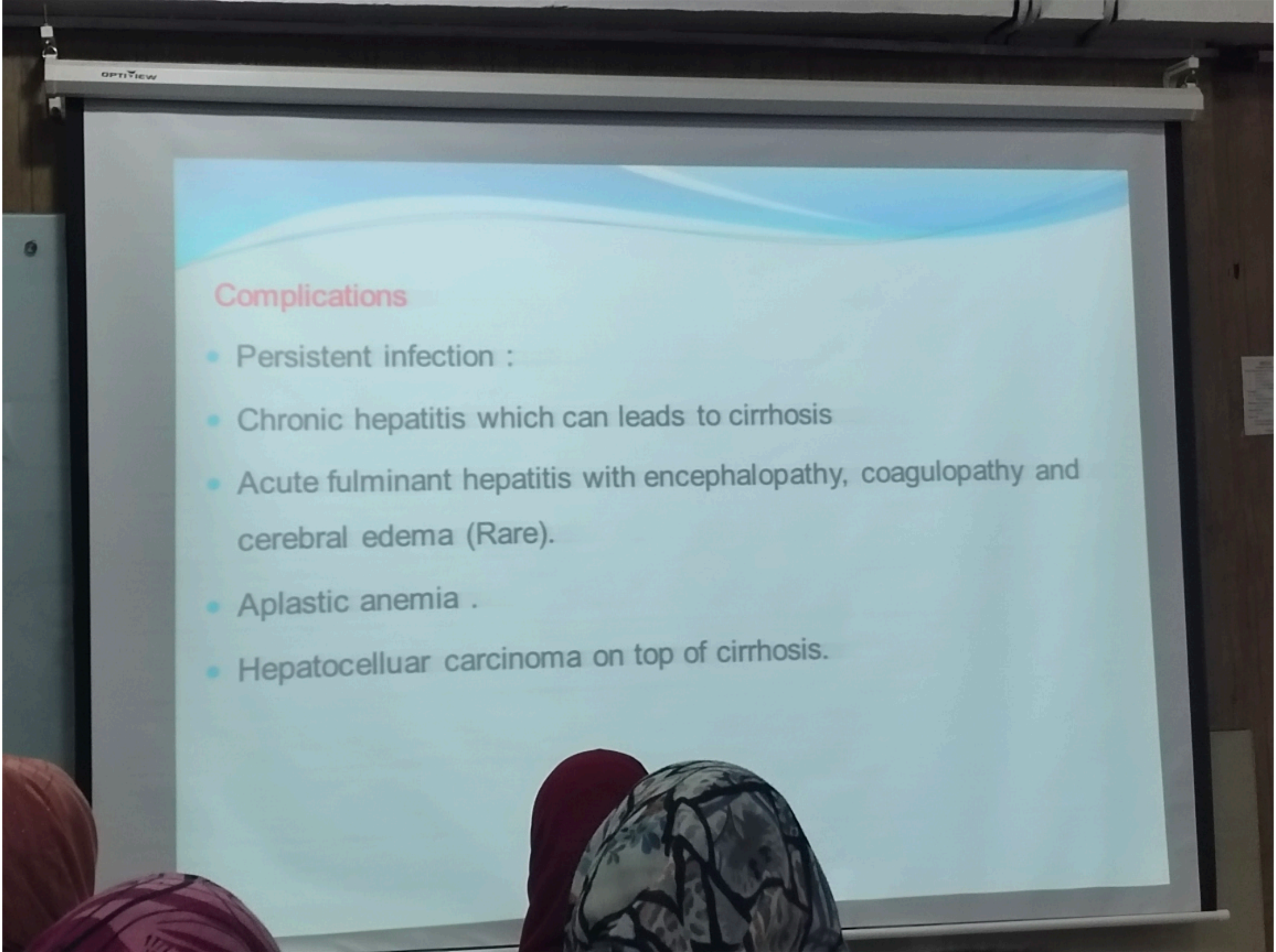
Liver function tests: The first evidence of infection is elevation of ALT. which begin to rise before the prodromal symptoms appears.

Hepatitis markers:

- Routine screening for HBV requires at least two serological markers:

-HBsAg which indicate infection and HBeAg which indicate infectivity.

-HBcAb (IgM and IgG) is detected early in the disease and is important because it differentiates between the carrier and acute and chronic patient.


Complications
Persistent infection :
Chronic hepatitis which can leads to cirrhosis
Acute fulminant hepatitis with encephalopathy, coagulopathy and cerebral edema (Rare).
Aplastic anemia .
Hepatocelluar carcinoma on top of cirrhosis.

Treatment

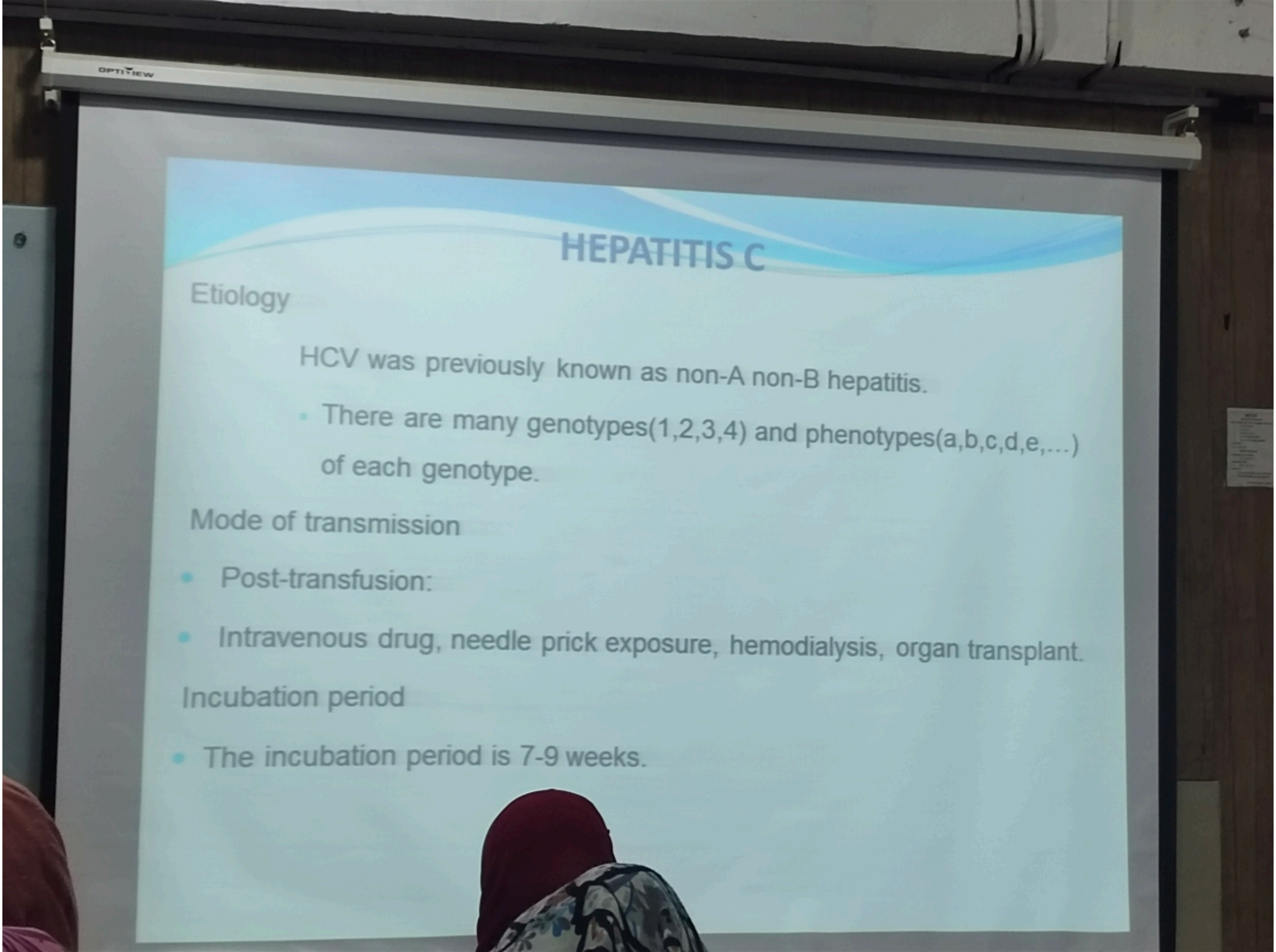
- Supportive treatment.
- Interferon α 2b and lamivudine are used in chronic HBV in adult.
- Liver transplantation is used in end stage HBV infection

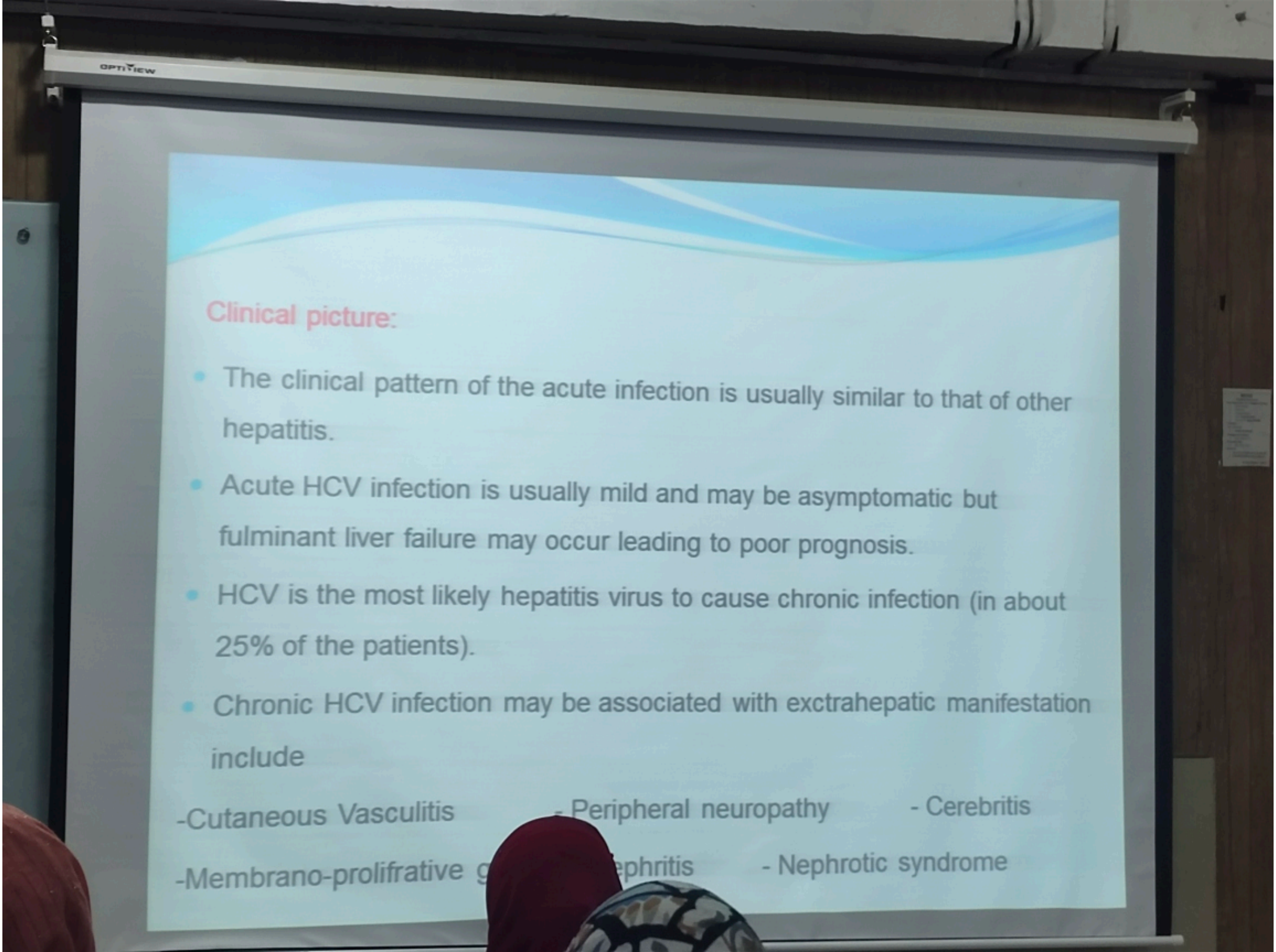
Prognosis

- Recovery may be complete.
- The child may remain as an a symptomatic carrier ,0r chronic patient for months or years.

Prevention

- Hepatitis B vaccine is now included in the first year compulsory vaccination program worldwide.
- Hepatitis B immunoglobulins (0.5 ml) should be given soon after delivery to babies whom mothers are HBsAg positive together with HB vaccine
- Proper screening of blood and blood products to eliminate all blood-borne viruses.


HEPATITIS C
Etiology
HCV was previously known as non-A non-B hepatitis.
There are many genotypes(1,2,3,4) and phenotypes(a,b,c,d,e,...) of each genotype.
Mode of transmission
Post-transfusion:
Intravenous drug, needle prick exposure, hemodialysis, organ transplant.
Incubation period
The incubation period is 7-9 weeks.


Clinical picture:
The clinical pattern of the acute infection is usually similar to that of other hepatitis.
Acute HCV infection is usually mild and may be asymptomatic but fulminant liver failure may occur leading to poor prognosis.
HCV is the most likely hepatitis virus to cause chronic infection (in about 25% of the patients).
Chronic HCV infection may be associated with exctrahepatic manifestation include
-Cutaneous Vasculitis
- Peripheral neuropathy
- Cerebritis
-Membrano-prolifrative g
ephritis
- Nephrotic syndrome

Laboratory Diagnosis

- Liver function tests: Fluctuating pattern of elevation of the levels of transaminases.
- Serologic assays:
- Diagnosis of HCV infection is based on detection of antibodies to HCV antigens.
- This assay is used for detection of chronic hepatitis C because they remain negative for at least 1-3 months after the onset of illness.
- Detection of HCV antigens is done by polymerase chain reaction (PCR).

Complications

- Fulminant hepatitis .
- Hepatocelluar car
- Chronic hepatitis.
- is lower than HBV.

Treatment:

The effective therapy is under trial are:

-Monotherapy with Interferone α 2b

-Combination therapy with Interferone α 2b and Ribavirine results in higher frequency of sustained response and in histologic improvement.

Prevention:

- There is no available vaccine against HCV.
- Proper screening of blood and blood products to eliminate all blood-borne viruses.

LIVER CIRRHOSIS

What is Cirrhosis?

- It is defined as fibrosis (scarring) plus nodule formation (regeneration).

  Cirrhosis is a pattern, not a disease or a specific phenomenon.

- Cirrhosis can happen after any disease that causes liver cell death.

- Other organs like the kidneys, heart, and lungs are not able to regenerate.

Etiology:

- Several liver diseases can cause cirrhosis, including:
  - Hepatitis B and C
  - Nonalcoholic fatty liver disease
  - Biliary atresia
  - Alpha-1 antitrypsin deficiency
  - Primary sclerosing cholangitis
  - Wilson's disease
  - Autoimmune hepatitis, and bile duct diseases.

Autoimmune Hepatitis

- Autoantibodies against hepatocytes
- Young/middle age, mainly females
- Presentation: jaundice, RUQ pain, systemic symptoms
- May be associated with other autoimmune conditions
- Investigations
  - Type 1: anti-smooth muscle antibodies (80%), anti-nuclear antibodies (10%)
  - Type 2 (children): anti-liver/kidney microsomal type 1 antibodies
  - Liver biopsy
- Rx: immunosuppressant's (steroids, azathioprine), transplant

Primary Biliary Cirrhosis

- Chronic granulomatous inflammation of interlobular bile ducts
- Autoimmune: anti-mitochrondrial antibody (98%)
- Associated with other autoimmune conditions
- F:M 9:1,

Primary Sclerosing Cholangitis

- Inflammation, fibrosis and strictures ('beading') of intra and extra-hepatic bile ducts
- Autoimmune: ANCA (80%)
- Associated with IBD
- 20-30% develop cholangiocarcinoma

Wilson's Disease and Alpha 1 Deficiency

Wilson's Disease

- AR defect in copper transporting ATPase
- Copper accumulates in liver + CNS + Kayser-Fleischer rings
- Investigations: serum seruloplasmin level, 24hrs urinary copper level and liver biopsy
- Rx: penicillamine, transplant

Alpha-1 Antitrypsin Deficiency

- AR deficiency of α1AT
- Serine protease inhibitor produced by liver
- Emphysema + liver damage

Diagnosis:

-Cirrhosis may occur early, irrespective of the cause.

-A combination of laparoscopy and biopsy is more reliable than biopsy alone for the diagnosis of cirrhosis in children with chronic hepatitis.

- Blood tests, CT scans, liver biopsies, and MRI and ultrasonography studies help confirm the cause of the cirrhosis, and the extent of liver damage.