Paediatric Gastroenterology

Marrow ss
Paediatrics 2024

Paediatrics Gastroenterology

LIVER

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2.  Diagnosis and Management of Autoimmune Hepatitis ★ 4.5 30 Min video
3.  Approach to Neonatal Cholestasis ★ 4.5 60 Min video
4.  Acute Liver Failure ★ 4.4 72 Min video
5.  Chronic Liver Disease ★ 4.4 67 Min video
6.  Portal Hypertension ★ 4.4 60 Min video
7.  Liver Transplantation: Indication, Evaluation & Contraindication ★ 3.9 72 Min video

ESOPHAGUS

8.  Foreign Body and Corrosive Ingestion in Children ★ 4.4 55 Min video
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STOMACH

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INTESTINES

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19.  Inflammatory Bowel Disease: Ulcerative Colitis ★ 4.6 34 Min video
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21.  Abdominal Tuberculosis ★ 4.4 46 Min video
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PANCREAS

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MISCELLANEOUS TOPICS

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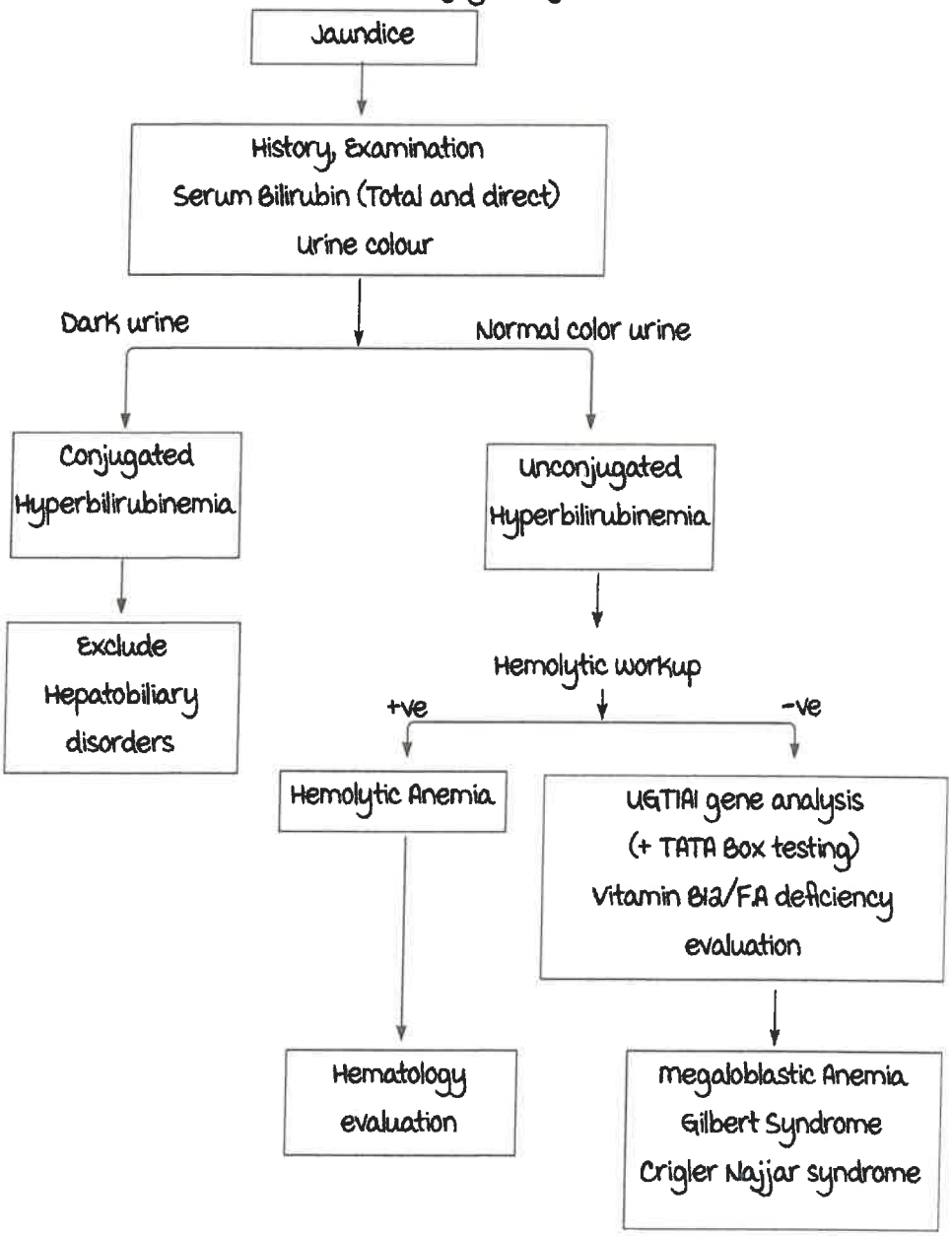
ACUTE HEPATITIS

Introduction

00:00:23

Clinical features :

- Jaundice (Icterus).
- Yellow discoloration of eyes, skin, & mucous membranes.
- Urine, stool colour :
  - Dark urine + Pale stools : Hepatic origin.
  - Normal urine colour : Unconjugated jaundice.



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Unconjugated bilirubinemia with negative hemolytic features :

- Gilbert syndrome :
  - Presents in older child.
  - Normal LFT.
  - Exacerbated in events of stress.
- Crigler Najjar syndrome :
  - Younger age group.
  - Type I and type 2.
  - may respond transiently to phenobarbitol.
  - Definitive Mx : Liver transplant.

Jaundice due to liver dysfunction :

Acute jaundice :

- Viral hepatitis.
- Drug induced.
- Systemic infections.
- Biliary sepsis (Cholangitis).

Chronic Liver disease :

- Wilson disease.
- Autoimmune liver disease.
- Viral hepatitis (B > C).
- Cholestatic disorders.
- Budd-Chiari syndrome.

Acute infective hepatitis :

Hepatotropic	Non Hepatotropic
• Hepatitis A • Hepatitis B • Hepatitis C • Hepatitis D • Hepatitis E	• Dengue • Parvovirus B19 • Cytomegalovirus, Epstein Barr virus • Herpes viruses (HSV I & 2) • Others : VZV, Adeno, HHV etc

Study	HAV	HEV	HBV	Co infection	Others
Panda et al Delhi, 1989 (n=456)	55.8 %	-	20.2 %	-	23.2 % (NANB)
Malathi et al Chennai, 1998 (n=127)	38.6 %	15.7%	13.4 %	21.3 %	-
Poddar et al, Chandigarh, 2002 (n=172)	64.5 %	16.3%	7.6 %	8 %	-
Srivastava et al, Lucknow, 2012 (n=130)	53.1 %	6.9%	13.8 %	26.2 %	-

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Summary :

- Hepatitis A : 38-65 %.
- Hepatitis E : 7-16 %.
- Hepatitis B : 8-20 %.
- Coinfection : 8-26 % (Can also see enteric fever).
- Unknown : 23 % → 11 % → 3.5 % → 0 %.

Note :

- Always exclude HAV, HEV, HBV in all AVH cases.
- Anti HCV : Silent/chronic cases.
- Complete evaluation in all → Co-infection.
- Test for NHVs (Serology/PCR) :
  - If acute liver injury + negative classical serology.
  - Choose as per clinical picture.
- In case of acute hepatitis B ask for anti HBcIgm.

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Viral hepatitis

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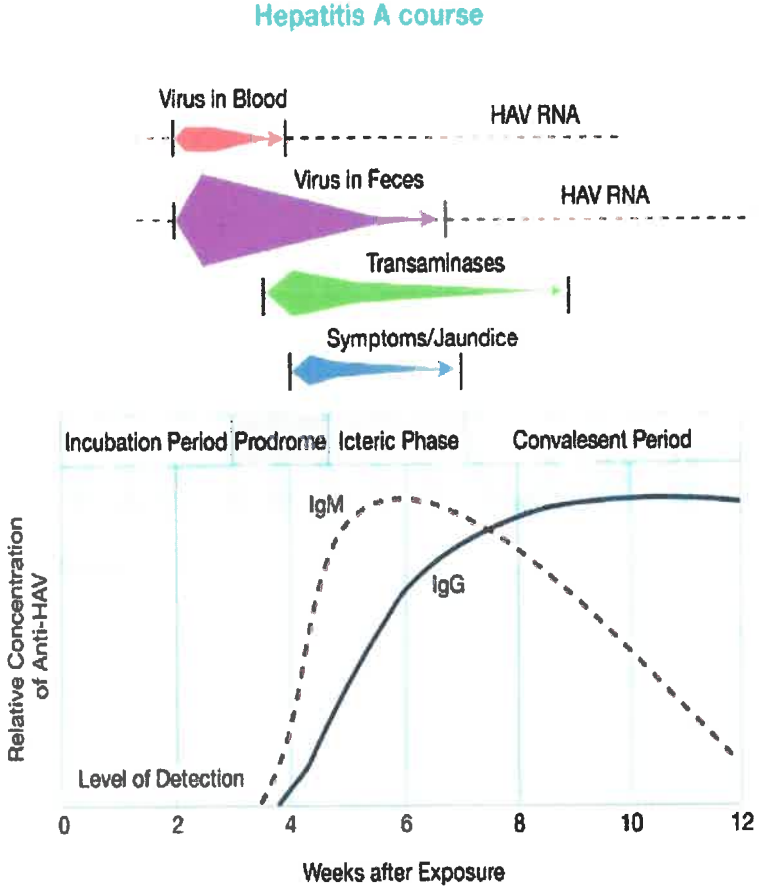
Typical hepatitis A :



Work up :

- LFT (Transaminases increases upto 10 times the normal).
- PT-INR.
- USG abdomen.

Etiological work up :

All patients :

- Igm HAV.
- Igm HEV.
- HbsAg, Igm Anti Hbc.
- Anti HCV : mainly in chronic cases.

Selected patients/if above negative :

- Igm Cmv/EBV/VZV/HSV/dengue/ parvo/adeno virus.

Differential diagnosis of acute jaundice :

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With Persistent/Prolonged Fever (after Jaundice appears)	Without Fever
• Malaria/Typhoid/Leptospirosis • Biliary sepsis (Cholangitis) • Liver Abscess (Rarely)	• Wilson disease • Autoimmune Liver Disease • Drugs/Toxins : – ATT drugs – Herbal medicines – Paracetamol – Valproate/Other Antiepileptics – Amox-Clavulanic Acid

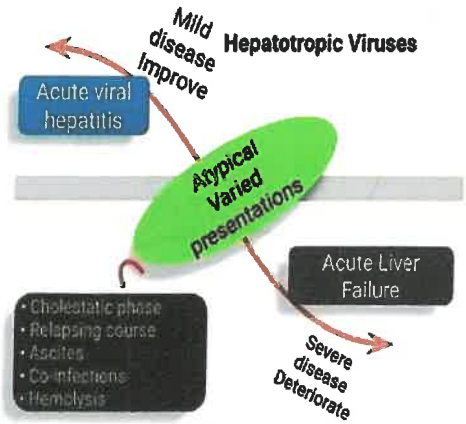
Spectrum of hepatitis A :

Complicated :

- Hyperacute liver failure.
- Acute liver failure.
- Late onset hepatic failure.
- Acute on chronic liver failure.

Atypical (30%) :

- Hepatic :
  - Prolonged cholestasis.
  - Relapsing hepatitis.
  - Ascitic form.
  - Autoimmune trigger.
- Extra-hepatic
  - Intravascular hemolysis, aplastic anemia.
  - Immune thrombocytopenia.
  - HLH, Guillian-Barre syndrome.
  - Transverse myelitis.
  - Glomerulonephritis.
  - Myocarditis, myositis.



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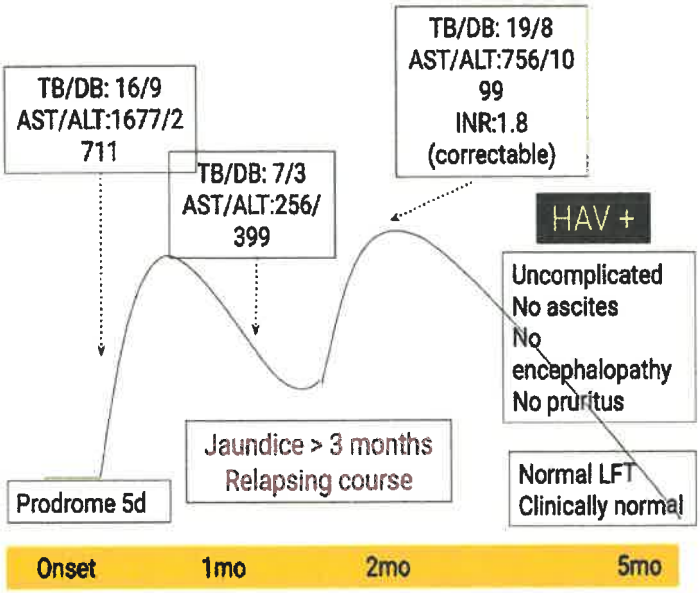
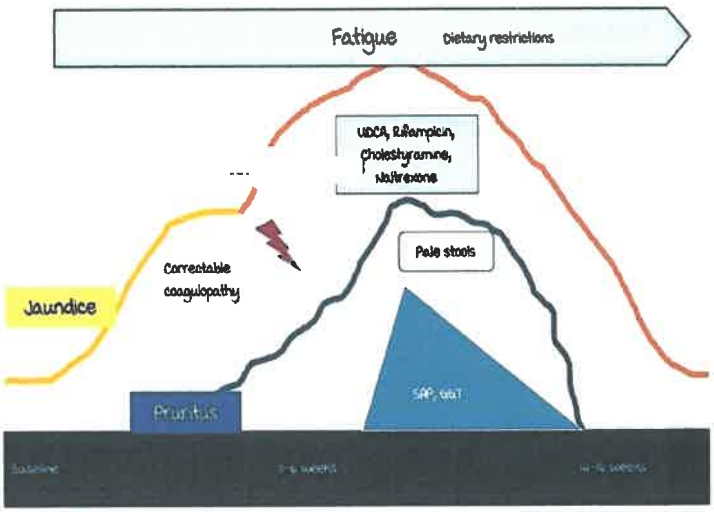
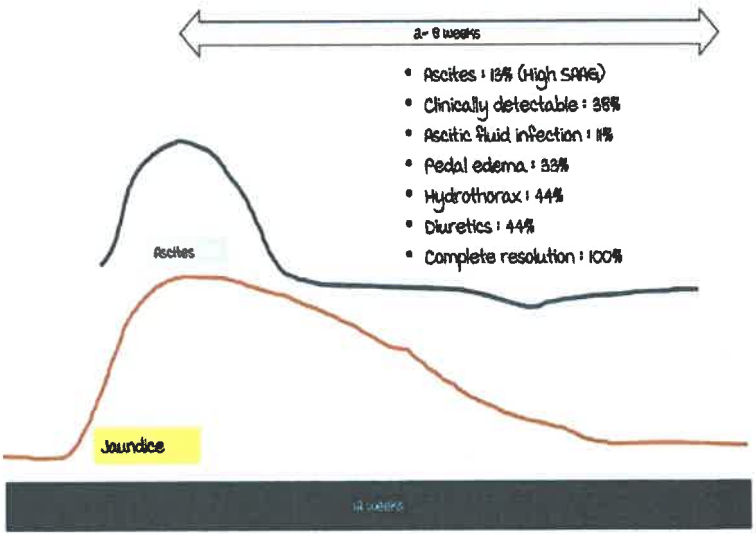


Prolonged cholestasis :



AVH with ascitis :



Late onset hepatic failure : 5 - 12 weeks.

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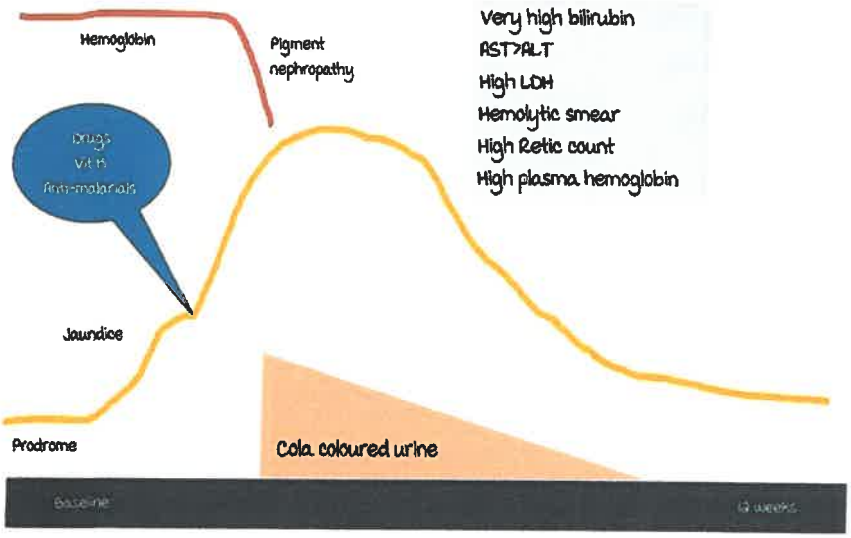
Intravascular hemolysis :



Causes :

- G-6-PD deficiency : 36%.
- HAV associated autoimmune hemolysis.
- Presenting feature in 6.7% cases of Wilson disease.
- In all Wilson disease : 22%.
- Wilson with ALF : 68%.
- Autoimmune hemolysis in AIH : 35%.

Hematological manifestations :

- Aplastic anemia: 5-11% hepatitis asso aplastic anemia.
- HAV : <3% cases.
- Hepatitis to aplastic anemia: 62 days.
- Adolescent males.
- CD8 T cell mediated BM suppression.
- Good outcome with BM transplantation.
- Anti-thymocyte globulin, Cyclosporin.
- HLH.
- Immune thrombocytopenia.
- IgG glycoprotein IIb/IIIa.
- Thrombocytopenia : 2.6%.
- Leukopenia : 16%.

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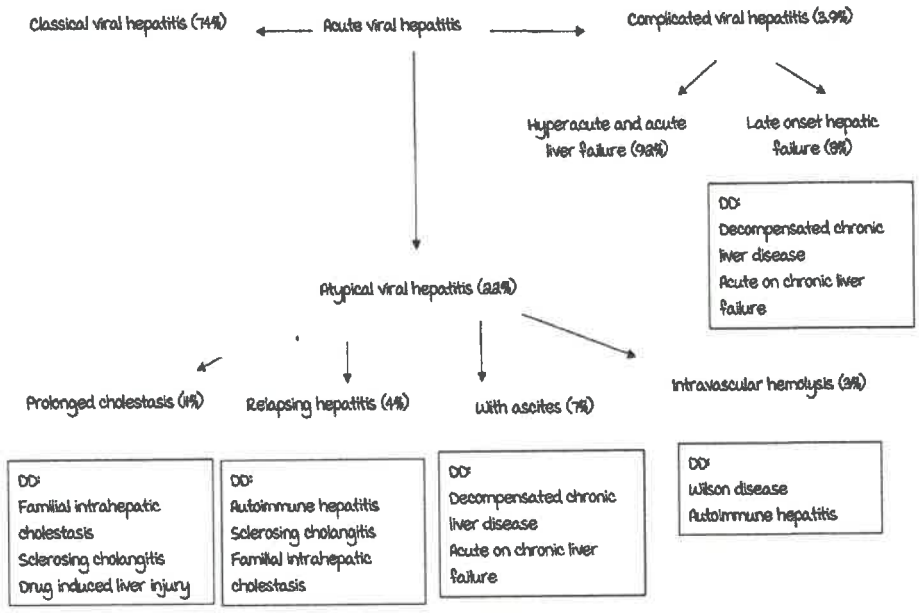
Other atypical manifestations :

- Guillian-Barre syndrome.
- Mononeuritis multiplex.
- Transverse myelitis.
- Myasthenia gravis.
- Cardiomyopathy.
- Myositis.
- Acute pancreatitis.
- Glomerulonephritis.
- Cryoglobulinemic vasculitis.
- Antiphospholipid antibody syndrome.
- Systemic lupus erythematosus.



Tropical infection > Viral hepatitis :

- High grade persistent fever (Look for HLH also).
- Associated with :
  - Severe anemia.
  - Conjunctival redness, oliguria.
  - Skin rash, plasma leak.
- Labs :
  - Thrombocytopenia.
  - Minimal to mild icterus.
  - AST > ALT, < 400-500 IU/L.
  - High CPK, LDH.

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Case scenario :

- 15yr old female.
- Pain abdomen : Rt. hypochondrium-epigastrium, lasting for 3-4hrs.
- Recurrent jaundice with high coloured urine (7-10d).
- High fever with chills (Requiring antibiotics).
- Pale stools.
- Recurring from age 5 to age 15 : Consider cholangitis.

Note :

Charcot's triad : Jaundice with high colored urine, right hypochondrial pain, fever with chills.

Differential diagnosis :

- Choledochal cyst.
- CBD stones.
- Sclerosing cholangitis.
- Caroli's disease.
- Biliary ascariasis.

General Treatment of AVH :

- Reassurance.
- Normal diet, plenty of fluids.
- No medications needed (In majority).
- No restriction on diet.
- No bed rest needed.

Don'ts :

- Bland food : Restriction of salt, fat, spices, turmeric.
- Herbal medicine intake.
- Glucose water, sugarcane juice intake.

Suspect underlying CLD with acute jaundice :

- Prolonged history, FTT.
- Positive family or past history of liver disease.
- Decompensation (Ascites, Encephalopathy).
- Firm organomegaly, CLD stigmata.
- USG : Coarse echotexture, nodularity, collaterals, splenomegaly.

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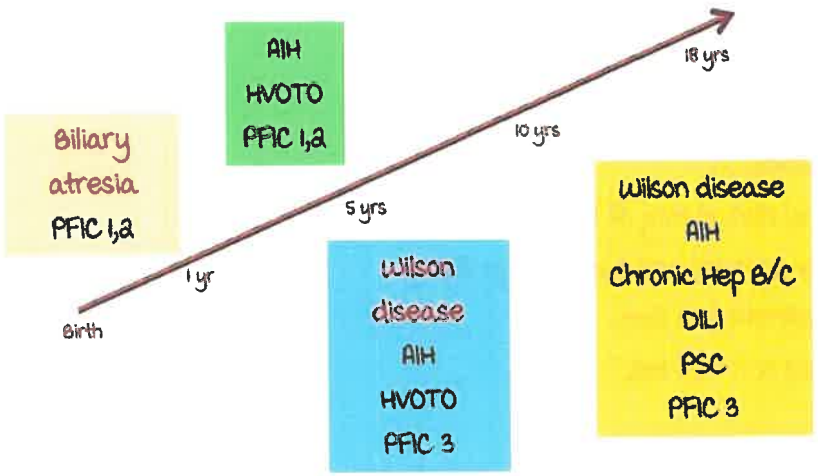
CLDs with jaundice :

- Viral Hepatitis : HBV.
- Autoimmune liver disease :
  - AIH.
  - Overlap.
  - PSC.
- Vascular disorders : Budd Chiari syndrome.
- Cholestatic diseases :
  - Biliary atresia.
  - Progressive Familial Intrahepatic Cholestasis (PFICs).
  - Alagille syndrome
  - Fibrocystic diseases.
- Drug induced/toxic liver injury.

Age-wise distribution of CLDs :



Etiological pointers :

- Viral Hepatitis : Previous BT/injection use/tattooing/surgical procedures, family history.
- Wilson's disease :
  - Recent change in behaviour/school performance/handwriting.
  - Increasing pallor, cola coloured urine (Hemolysis), family history.
- Autoimmune disease.
- Recurrent jaundice, rash, joint pains, redness of eyes, increasing pallor, cola coloured urine.
- Cholestatic liver disease : Pruritus/jaundice.

- Vascular disease : Ascites + jaundice.

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Hepatitis B

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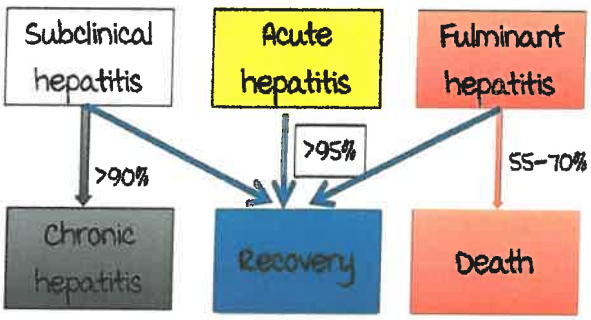
HBV infection in children :

Age of infection	Rate of persistent infection
Perinatal period (mother HBsAg+) HBeAg + HBeAg -	>90% 20%, (risk of FHF in precore mutant mother)
Preschool age (1 – 5 yr)	20 – 30%
School aged (5 – 15 yr)	6%
Adult	1 – 5%

Pathogenesis of HBV :

- HBV infection.
- Immune system maturity levels.
- Hepatocyte damage.

Natural History of Hepatitis B infection :



Phases of chronic hepatitis B infection :

Depending on the virus–host interaction.

1. Immune tolerance : HBeAg-positive infection.
2. Immune clearance : HBeAg-positive hepatitis.
3. Low or non-replication phase : HBeAg negative infection.
4. Phase IV : HBeAg negative hepatitis.

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Immune tolerance phase :

- Characteristics :
  - Presence of HBe-Ag antigen.
  - High HBV-DNA.
  - Normal or minimally elevated ALT level.
  - Liver Bx : Normal liver histology or minimal histological activity or scanty fibrosis.
- Persist for 10 to 30 years in perinatally acquired hepatitis B.
- Short-lived or absent in horizontally acquired hepatitis B.

Immune clearance phase :

- HBe-Ag positive.
- HBV-DNA levels : Fluctuating but progressively decreasing.
- Serum HBV-DNA : > 20,000 IU/ml (105 copies/ml).
- Elevated ALT.
- Liver biopsy : moderate or severe necro-inflammation with variable amounts of fibrosis.
- most of these patients acquire hepatitis B in late childhood, adolescence, or adulthood.

Low or non-replication phase : Inactive carrier.

- HBeAg negativity and anti-HBe positivity.
- HBV-DNA : Undetectable or low (< 2000 IU/ml, 104 copies/ml).
- Persistently normal ALT levels.
- Liver Bx : Inactive liver histology with a usually minimal amount of fibrosis.

Phase IV : E negative hepatitis.

- IVa : Reactivation with the wild-type virus : HBe-Ag +ve state.
- IVb : Replication-competent HBV variants : HBe-Ag -ve disease.
  - HBeAg -ve with anti-HBe.
  - HBV-DNA : 2000-20 mIU/ml (104- 108 copies/ml).
  - ALT elevated.
  - Liver bx : moderate or severe necro-inflammation with variable amounts of fibrosis.
- IVc : Inactive carrier may lose HBs Ag & developed anti-HBs but low titer of HBV DNA persists → Reactivation.

Occult Hepatitis B :

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Definition :

Presence of HBV DNA in the liver of individuals testing HBsAg-negative with currently available assays & a cutoff value for serum HBV DNA (< 200 IU/mL).

Clinical importance :

- Reactivation.
- Blood transfusion in immune-compromised recipient.
- Organ donation :
  - Liver transplantation.
  - Non liver solid organ transplantation.

Goals of antiviral therapy :

1. HBeAg seroconversion : Decrease in viral replication.
2. Normalization of serum aminotransferases.
   Normalization of Liver histopathology.
3. Prevention of progression of liver disease including cirrhosis and HCC.

Indication of treatment :

- Duration : more than 6 months.
- Biochemical : Raised transaminases > 2 X UNL.
- Viral replication : Hbe Ag +ve and high DNA.
- Liver histology : Disease activity.

Acute Hepatitis B :

- Asymptomatic ← Self-limited hepatitis → FHF.
- Incubation period : 45-180 days.
- Children <5yrs : Anicteric acute hepatitis B.
- Prodrome : Anorexia, fever, nausea, vomiting, myalgia, hepatomegaly.
- Icteric phase :
  - Jaundice, dark urine hepatomegaly.
  - Self-limited course.
  - Recovery is marked by anti-HBs seroconversion.

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Other causes of acute hepatitis

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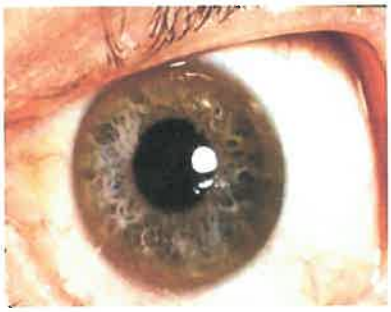
Wilson disease :

Presentation :

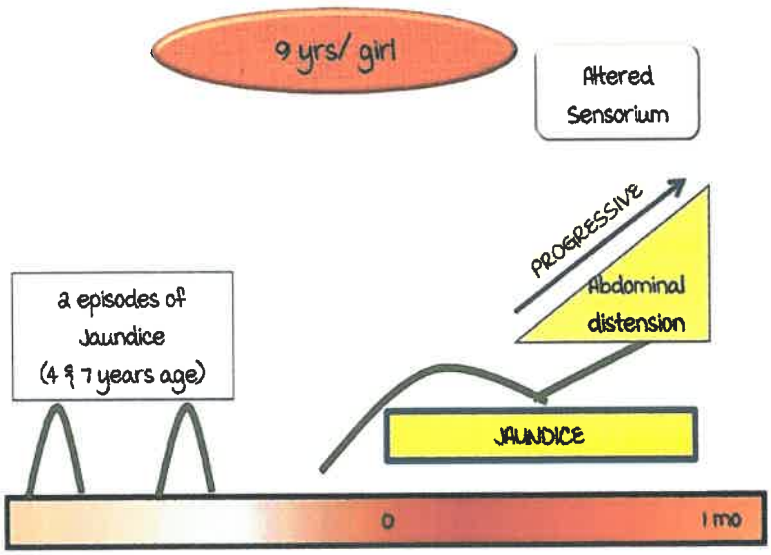
- Persistent hypertransaminasemia.
- Asymptomatic hepatomegaly.
- Fatty liver.
- Acute hepatitis (25 %).
- Chronic Hepatitis (10-30 %).
- Cirrhosis .
- Acute liver failure (10 %).

Features :

- Any suspected liver disease
- Associated neurological illness.
- Positive family history.
- Serum ceruloplasmin is low.
- Eye examination for KF ring.
- 24 hour urinary copper.



Case scenario :



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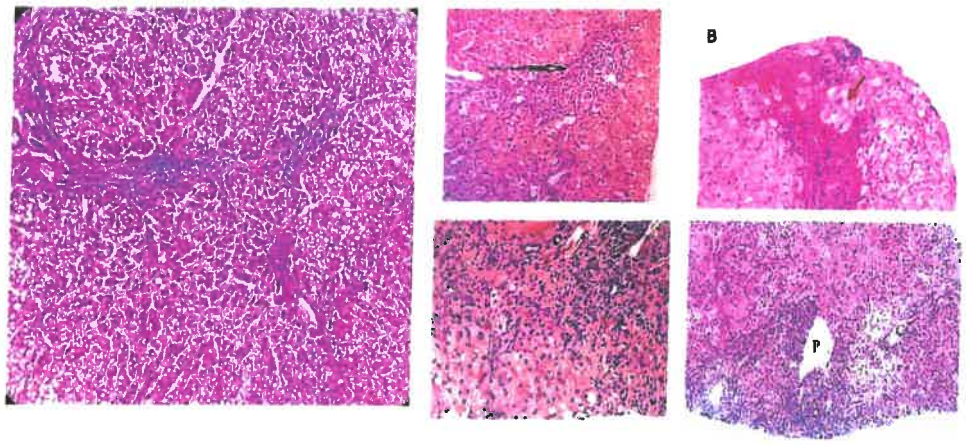
Investigations :

	Baseline
Bil (T/D)	8.7/4.7
AST/ALT	356/670
SAP/GGT	292/84
Prot/ Alb	8/2.3
INR	2.4
Hb	8.0
TLC	11600
Platelet	3l

Others
IgG- 53 (8-13.5)
ANA +ve (1:40)
ASMA / LKM-1 /SLA -ve
Viral markers : negative
Retic Count 3.8%,
DCT +ve,
Per. Smear- Hemolysis +++
LDH 800

Liver Biopsy :



Features :

- Micro and macronodular cirrhosis.
- Lymphoplasmacytic infiltrate.
- Interface activity
- Pseudo rosettes.
- Confluent necrosis.
- Emperipolesis.

Features :

- Recurrent jaundice.
- more incident in female sex.
- Associated thyroid, skin, hemolysis, celiac disease conditions.

Investigations for diagnosis :

- Total IgG.

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- DCT, retic count.
- ANA, ASMA, LKM-1.
- + Liver biopsy.

Chronic viral hepatitis :

- Any suspected liver disease.
- Positive family history
- HbsAg, Anti Hbc total.
- Anti HCV.

Cholestatic liver disease :

Age of Presentation

Infancy-Preschool

Pruritus

GGT **High** → Alagille's Syndrome

Low → PFIC 1 & 2

Childhood-Adolescence Pruritus (High GGTP)

Portal Hypertension → PFIC 3

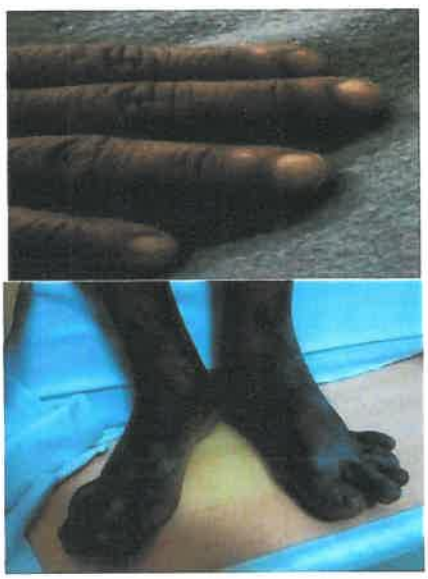
Episodes of Cholangitis → Sclerosing Cholangitis

Features :

- Itching, pale stools.
- Associated vitamin deficiency.
- Positive family history.

Investigations :

- Serum GGTP levels.
- Ultrasound abdomen.
- Liver biopsy.
- Genetic testing.



Shiny nails and lichen skin.