Inflammatory Bowel Disease (IBD)

↳ IBD represent a group of Intestinal disorders that cause prolonged inflammation of the digestive tract.
↳ It is a spectrum of chronic idiopathic inflam. condⁿ
↳ Inflam. on any part of GIT may disturbed Digestion process

Types of IBD =

① Ulcerative Colitis – is a disease that causes mucosal inflam. and Sore (ulcer) in the lining of large intestine (colon). # 40-250/100K # Common in Male

② Chron's Disease → is a chronic, relapsing & remitting inflammatory disease, affect any part of GIT
25-200/100K # Common in Female

Symptoms –
↳ Diarrhoea ↳ GI Bleeding
↳ Abdominal pain ↳ Weigh loss
↳ Fatigue ↳ Anemia

Diagnosis → Endoscopy, Biopsy, Radiology
Blood Test (Anemia, ↓Albumine, ↑CRP, Anti saccharomyces cerevisiae antibody (ASCA) +ve

Etiology :→
↳ Genetic ↳ Enviromental pollution
↳ Infection - * Measles virus * Mycobacteria
↳ Unhealthy life style → Diet, Smoking, Alcohol

Pathophysiology –

Etiological Agent (bacteria/virus) → GI wall → Dendritic Cells → CD4+ T cell → Activate Immune Sys

Immune Cells → Inflammatory molecule (TNF & IL) → Disrupt GI mucosal layer → Chron's Dis / Ulcerative Colitis

TH → TH1 → Chron's Dis
TH → TH2 → Ulcerative colitis

Treatments ⇒ Main Goal – ↓ Inflammation & Symptoms

A) Life style Modification

B) Drugs –
Antibiotics – Ciprofloxacine, Metronidazole
Immunosupressant - Methotrexate, Azathioprime.
Anti-inflammatory → Corticosteroids, Aminosalicylate

C) Surgery

* Supporting drugs – ↳ Antigastric drugs, ↳ Antidiarrhoeal
↳ Folate/Vit B_{12} ↳ Nutritions
↳ Pain killer ↳ Ca^{2+} & Vit D supplement

PC Pharmacology Concepts By Rajesh Choudhary

Clink the icon → Video Lectures Website/Notes

JAUNDICE PATHOLOGY

Jaundice is a medical condition of Hyperbilirubinemia and deposition of the bile pigments, which is characterised by Yellowish discoloration of skin, sclera and mucous membrane.

↳ Hyperbilirubinemia = > 50 µmol/L (3 mg/dL)

↳ It is a sign of many disease (Liver damage)

#Types of Jaundice

1) Prehepatic (Haemolytic) Jaundice → Occurs as a result of haemolysis, leading to production of bilirubin in excessive amount (0.3–1 mg/dL)

2) Hepatic Jaundice → Due to Liver disease or injury (0.3–20 mg/dl)

3) Post-hepatic (Obstructive) Jaundice → Due to obstruction of billary duct (carry the bile from Liver to gallbladder & small intestine) (0.6–45 mg/dl)

#Etiology ⇒

↳ Inflammation ↳ Haemolytic anemia

↳ Obstruction of bile duct ↳ Cholestasis

↳ Gilbert's Syndrome – ↓ Bilirubin Excretion (↓ Enz)

↳ Crigler Najjar Syndrome – ↓ Bilirubin processing

#Symptoms ⇒

↳ Yellowish discoloratn ↳ Fever

↳ Itching (Pruritic) ↳ Fatigue

↳ Dark urine/stool ↳ Weight loss

↳ Vomiting

#Pathophysiology

- Gilbert's Syndrome → ↓ excretn → JAUNDICE

Erythrocyte breakdown ← • Malaria • Sickle cell • Hemolysis

→ "Prehepatic/Haemolytic" → ↑ unconjugated bilirubin → JAUNDICE

JAUNDICE ← "Hepatic" ← Liver Damage

- Hepatitis
- Hep. Carcinoma

JAUNDICE ← ↑ Conjugated bilirubin ← Intrahepatic ← swelling, Fibrosis, Obstruction ← "Post hepatic"

- Cirhosis
- cholengitis
- hepatitis
- Pancreatic Carcinoma

#Treatment – Depend on etiology

↳ Hepatitis induced → antiviral drug & Corticosteroids

↳ Anemia induced → Iron & Nutrition supplement

↳ Obstructive Jaundice → Surgery

↳ Drug induced → Select alternate medicine

↳ Hepatoprotective drugs

HEPATITIS PATHOPHYSIOLOGY

Hepatitis – Inflammation of the Liver Cells

 # Types :→ Based on virus infection –

1) **Hepatitis A** → Infected by Hep. A virus (HAV) from foods, water, oral/Anal contact sex, Currently not causes serious chronic disease.

2. **Hepatitis B** → It is a STD (Sexually transmitted dis.) caused by Hep. B virus (HBV), Spread by contact of infected blood, Semen & other body fluids
   - ↳ Unprotected Sex with infected person
   - ↳ Using infected needles
   - ↳ Babies getting from mother's mik
   - ↳ Strong bite by infected person

   Hep-B / Liver Damage ⟶ Liver Cancer

3) **Hepatitis C** → by HCV, spread from direct contect of infected blood., having low risk of Liver cancer, Hep-C + Cirrhosis may enhance the risk of cancer.

* Donated blood is tested for Hep B & Hep C

4) **Hepatitis D** → Only person who is already infected with hep-B can become infected with hep.-D. caused by HDV, spread by infected blood, unprotected sex & infected needle.

5) **Hepatitis E** → by HEV, through inf cted water & oral/Anal sex

6. **Hepatitis X** → From unknown virus

7. **Hepatitis G** → by HGV,

 # Symptoms → Flu like Symptom, Dark urin, pale stool, abdominal pain, loss of apetite, yellowish skin & eyes.

PATHOPHYSIOLOGY

Risk Factors
(Alcohol, Toxins, virus, pathogens, etc)
↓
(+) Immune Respons
↓
Hepatocyte Damage & ↓ cellular function
↓ Metabolic & detoxification function
↑ size & no of Kuffer cells
↓
Liver Inflammation → Pain, Fever, Anorexia, ↑ WBC, Fatigue
↓
Altered blood & Lymph flow
- → Bleeding disorder
- → altered Bilirubin metabolism → Jaundice, Dark urine/stool

Management –

1) Hep. A → Vaccine, Child (12–18 month)
2) Hep B → Antiviral drugs & Vaccine
3) Hep. C → Antiviral drugs
4) Hep. D → α-Interferon
5) Hep-E → No specific medicatn

Supporting therapy → Paracetamol, Antigastric drug. antivomitting drugs, Vitamins Supplement

ALCOHOLIC LIVER DISEASES

Chronic Alcohol consumption may lead to several diseases including "Fatty Liver", "Alcoholic hepatitis" & "Cirrhosis"

Significant amount of alcohol that may lead to Liver damage
- For Men - ≥ 75-100 ml/day for 20Y
- For Women - ≥ 25 ml/day - Major risk

Metabolism ⇒ Ethanol $\xrightarrow[\text{Al.DH}]{\text{Oxd}^n}$ Acetaldehyde $\xrightarrow{\text{Ald DH}}$ Acetic acid $\xrightarrow{\text{Ac.CoA Synthase}}$ Acetyl CoA $\xrightarrow{\text{TCA}}$ H_2O/CO_2

PATHOPHYSIOLOGY

Chronic Alcohol Intake
- → Acetaldehydrate
  - → NADH Production
    - ↑ Lipogenesis & ↓ FA Oxidation → **Fatty Liver** (* 90% cases)
    - → Oxidative Stress
  - → Lipid peroxidat^n
- → Gut derived endotoxin → Inflammation → Hep. Setellate Synthesis → ↑ Collagen Synthesis → **Liver Fibrosis**

Oxidative Stress + Lipid peroxidat^n → **Hepatocyte Injury**

Common Symptoms – Abdominal discomfort, Nausea, Vomitting, Fever, Joundice, Portal hypertension, Ascites,

Diagnosis – Liver Function test

Alc. Hepatitis

Inflammation of hepatocyte, developed 10-20% of heavy drinkers
Relation b/w drinker & Alc. hepatitis is complex

Clinical Complecations → # Kidney & Liver damage
Ascites → Fluid accumulation in abdomen
Confusion & Behavioral Changes
Malnutrition due to loss of appetite

Pathogenesis

Alcohol → Toxins → Inflammat^n → Liver damage (hepatitis) → Irriversible Scarring → **Cirrhosis**

Risk Factors ⇒ Obesity, Genetic Factor, Women Black Races, Binge drinking.

Treatment/Prevention
- Modify your daily life style
- Protect your self from hepatitis-C infection
- Antibiotics for other infection
- Hepatoprotective agents
- Vitamins & Nutritional Supplement
- Liver transplants

ALCOHOLIC LIVER DISEASES

Chronic Alcohol consumption may lead to several diseases including "Fatty Liver", "Alcoholic hepatitis" & "Cirrhosis"

Significant amount of alcohol that may lead to Liver damage
- ↳ For Men - ≥ 75-100 ml/day for 20 Y
- ↳ For Women - ≥ 25 ml/day * Major risk

CIRRHOSIS

↳ Irreversible end stage of Liver disease, causing hepatocyte damage & marked by -

Inflammation (Swelling)
Fibrosis (Cellular hardening)
Scarring & nacrosis (Cell death)

↳ Alcohol → Acetaldehyde → ↑ Collagen deposition by hep. stellate cells

"Cirrhosis" ← Fibrosis ↵

Symptoms - Jaundice, Hepatomegaly, Pain,

Diagnosis - ↳ Liver function test (SGOT, SGPT, ALP, etc)
- ↳ Imaging test → Ultra sound, CT Scan, MRI
- ↳ Liver Biopsy, Endoscopy

Complications

Portal Hypertension - + Antihypertensive drug

several scarred → Hardening → ↑ Blood Pressure unable to Flow

(Varices)* new vessels ↵

Ascites - Fluid accumulatn in peritoneal cavity
- ↳ Diuretics may be used to reduce edema

Hep. Encephalopathy - Increased toxins in blood, that may cause - confusion, disorientation, muscle stiffness, tremmor, etc
- ↳ Treatments - Lactulose, Antibiotics (metronidazole, Neomycin, Rifaximin), L-ornithine-L-aspartate

Pancytopenia
Spleenomegaly

TREATMENTS of CIRRHOSIS -
- ↳ Alcoholic Abstinence
- ↳ Nutrition Diets - Proteins, vitamins, Trace elements
- ↳ Drug Therapy - Steroids, Follic acid, Thiamine, Silymarin
- ↳ Liver Transplantation

Intra-Cellular Accumulation - Fatty Changes

* Accumulation of Lipids :- TG, cholesterol, phospholipids

A) Fatty change :- Intracellular accumulat^n of natural fats (TG) within the parenchymal cells of liver (fatty liver), Heart, skeletal mus. & kidney

* Liver is the common site, because it plays central role in the fat metabolism.

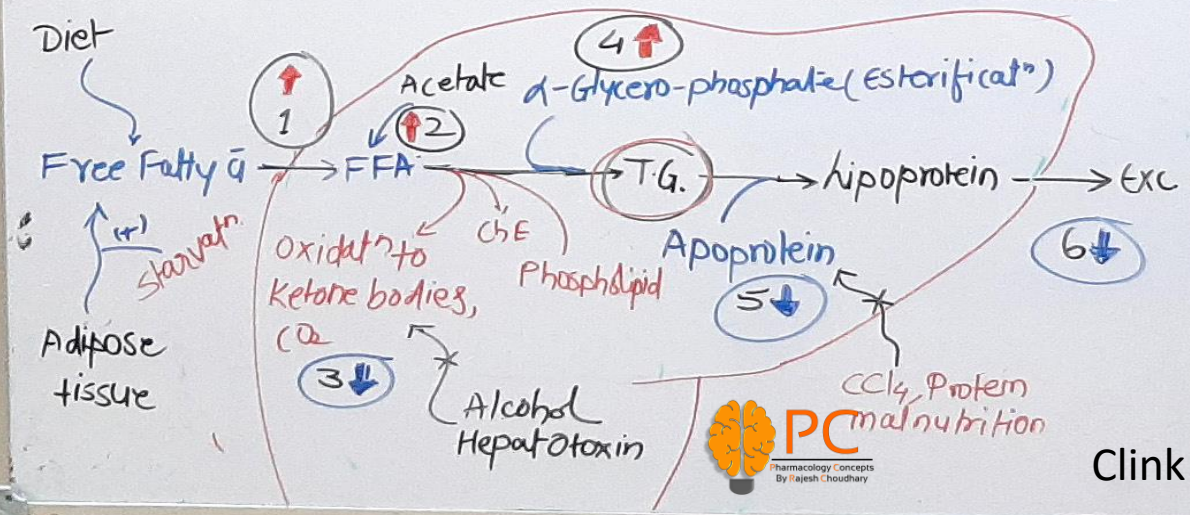
* Fatty liver :- reversible / irreversible depending on cause & amount of accumulation → Cell Injury

Etiology / Causes :-

(a) Cond^n with the excess fat - beyond the liver Metabolic capacity - Obesity, Diabetes, Congenital hyperlipidemia

(b) Liver Cell Damage - Unable to adaquate metabolism

- ↳ Alcoholic liver Dis.
- ↳ Starvation
- ↳ Hepatotoxin
- ↳ Tuberculosis
- ↳ Acute in late pregnancy
- ↳ Drugs / chem. - Pcm, MTx, Halothane
- ↳ Reye's Syndrome
- ↳ Hepatotoxins (Aflatoxin etc)



Morphological changes in Fatty liver :-

- ↳ Hypertrophy (enlargement of liver)
- ↳ Dark brown → Pale yellow, Softy & greasy
- ↳ Microscopic → Vacuole around the nucleus (early stage)
  → Cell Rupture (Late stage)

B) Cholesterol Deposits

- ↳ Intracellular accumulat^n of cholesterol & its ester in macrophages during in Hypercholesterolemia
- ↳ This turns macrophages into Foam Cell

e.g., - (i) Fibrofatty plaques of Atherosclerosis
(ii) Clusters of foam cell in tumor like masses called Xanthomas & Xanthelasma

C) Stromal Fatty Infilterat^n

- ↳ Deposit^n of mature adipose cells in stromal connective tissue in contrast to intracellular deposit^n of fats in the parenchymal cell in fatty liver

Etiology - Obesity → Site → Heart & Pancreas

"Heart" :- Site for intramyocardial fatty changes as well as epicardial (stromal) fatty infiltration

* Xanthelasma - yellowish deposit of cholesterol underneath the skin

* Xanthomas - Deposit^n of foam cell in the Subepithelial connective tissue of skin & in tendons

Clink the icon → Video Lectures Website/Notes