



DEPTH OF BIOLOGY



STUDY MATERIAL



YT-DEPTH OF BIOLOGY

INSTA- DEPTH OF BIOLOGY

TELE- DEPTH OF BIOLOGY



Alcoholic Liver Diseases

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↓
Fatty liver, Alcoholic Hepatitis &
Liver cirrhosis (develop in sequence)
↓
caused due to chronic Alcohol consumption.

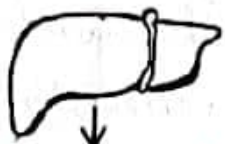
Risk Factors

1. Binge drinking for longer duration for years.
> 40g/day (men) for > 8 years.
> 20g/day (women)

other risk factors [DEPTH OF BIOLOGY]

2. Gender
3. Genetics
4. Obesity

Sequence of Alcoholic liver diseases



Healthy liver

Binge alcohol abuse



Alcoholic fatty liver / Steatosis Stage I

* in 90% of heavy drinkers

- fat accumulation
- no symptoms
- enlarged liver
- reversible

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Stage II

Alcoholic Hepatitis / Alcoholic Steatohepatitis

* in 10-35% of heavy drinkers

Sign and Symptoms

- inflammation of liver
- fever, fatigue
- Jaundice

- Painful enlarged liver (Hepatomegaly)
- yellowing of eyes and skin

Stage III

Liver Cirrhosis

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* in 10-20% of heavy drinkers.

- fibrosis
- shrunken liver
- end stage Hepatitis
- irreversible.

⚡: These stages can overlap. Timely diagnose can reduce the damage at minimal levels.

I. Fatty liver / Steatosis

- Excess build up of fat in liver cells

↓
causes difficulty in liver functioning

* Accumulated fats causes - Hepatomegaly.

* Once the Alcohol intake is reduced fat inside liver starts reducing too. Reversible

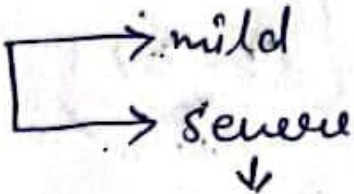
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II. Alcoholic Hepatitis / Alcoholic Steatohepatitis

inflammation of liver and liver cell damage

- Right upper abdominal pain, loss of appetite
- fever, weakness, Nausea, Vomiting

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* It can be 

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disease may occur suddenly with binge drinking
↓
causes life threatening complications
quickly as diagnosed.

II Liver Cirrhosis

due to scarring of liver as a result of years
of liver damage

These scars are spread to most of the liver
is referred to as cirrhosis.

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This begins with fibrosis

Symptoms

- High pressure in portal vein
- due to improper liver functioning.
- Confusion
- as the toxins remains in blood and reaches brain
- Enlarged spleen, internal bleeding, fluid buildup in abdomen.

Secondary complications of cirrhosis can be

- Liver cancer in some patient and may need or require a liver transplant.

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Pathophysiology

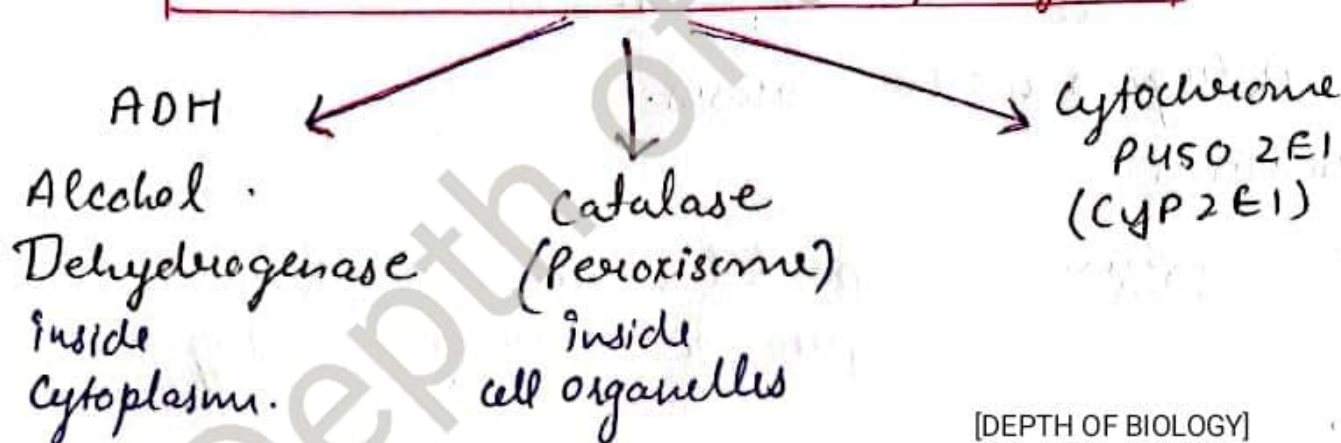
* Liver is the major site for the alcohol metabolism in human body.

Inside liver there are 3 major pathways for alcohol metabolism

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Alcohol $\xrightarrow{\text{metabolises to}}$ Acetaldehyde

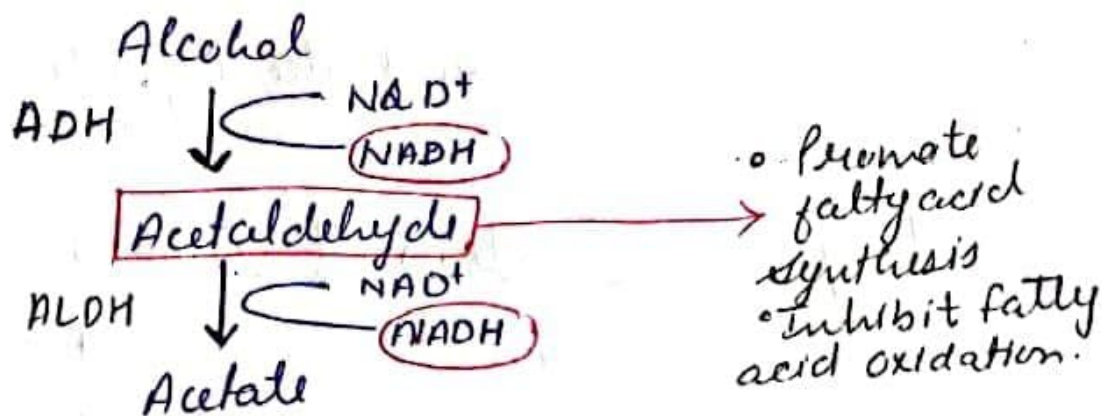
Pathways for Alcohol Metabolism
in Liver (in Hepatocytes)



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① ADH pathway (Major)

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If $\text{NADH}:\text{NAD}^+$ is higher $\rightarrow$ $\uparrow$ fatty acid synthesis
 $\downarrow$ fatty acid oxidation



* This leads to excessive fat accumulation in liver

Alcohol reduces export of fat from liver

Fatty liver

* This causes large, heavy, greasy, tenderness of liver, liver become yellow coloured.

* But no other signs and symptoms like fever or elevated Neutrophils.

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II - CYP-2E1 pathway.

* Produces more of (ROS) Reactive Oxygen species in the process.

① ROS damages → DNA & proteins

* ROS is more harmful to malnourished people with lesser antioxidants.

② Excessive Alcohol intake triggers liver Macrophages inflammation

③ Acetaldehyde → binds cellular proteins and forms Adducts

↓
recognised as Foreign Antigen

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↓
Provokes inflammatory Response.

* Increased no. of Neutrophils → to clean the damage

* These neutrophils destroy Hepatocytes in process of

Adduct destruction.

↓
Alcoholic Hepatitis

* Cells become damaged and inflamed
Mallory Bodies can be found in this stage
damaged intermediate filaments in the
cytoplasm of hepatocytes (histologic change)

• Painful Hepatomegaly

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• Neutrophilic leukocytosis.

• Neutrophils ↑ in blood.

• Scar tissue start forming around central
vein of liver → Perivenular fibrosis.

• Damage leads to leakage of liver enzymes
↑ ALT, AST in Blood

≠ ↑↑ AST will be increased more than ↑ ALT in
alcoholic hepatitis.

• GGT ↑, ALP ↑

• Thrombocytopenia → decreased Platelets

• Hypoglycemia → decreased Blood Sugar

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≠ High grade inflammation and constant tissue repair
causes scarring of tissue

↓
Liver internal structure is disrupted and
function decline.

↓
Scarring obstructs blood flow. Leads to high BP
in portal vein - brings blood from intestine to
liver

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↓
Toxins which was to be removed by liver reaches
general circulation due to impaired liver
functioning.

↓
These Toxins passes to brain causing -
confusion, drowsiness, tremors, variceal
bleeding, enlarged spleen, abdominal distention

Diagnostic Evaluation

- Signs of liver dysfunction (pale eyes, skin, right upper abdominal tenderness, loss of appetite, fever, etc.)
- Symptoms related to excessive alcohol use - itchy skin, confusion, hair loss, contracture of little finger
- Binge drinking
- Blood test - LFT - histopathic changes.
- Ultrasound, CT scan, MRI, Liver Biopsy

Treatment:

- Restrict alcohol intake
- Good amount of vitamins and nutrition
- Corticosteroids to reduce inflammation
- Liver Transplantation in liver Cirrhosis.

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