Treatment of alcohol related problems- medical perspective

Dr G Venu

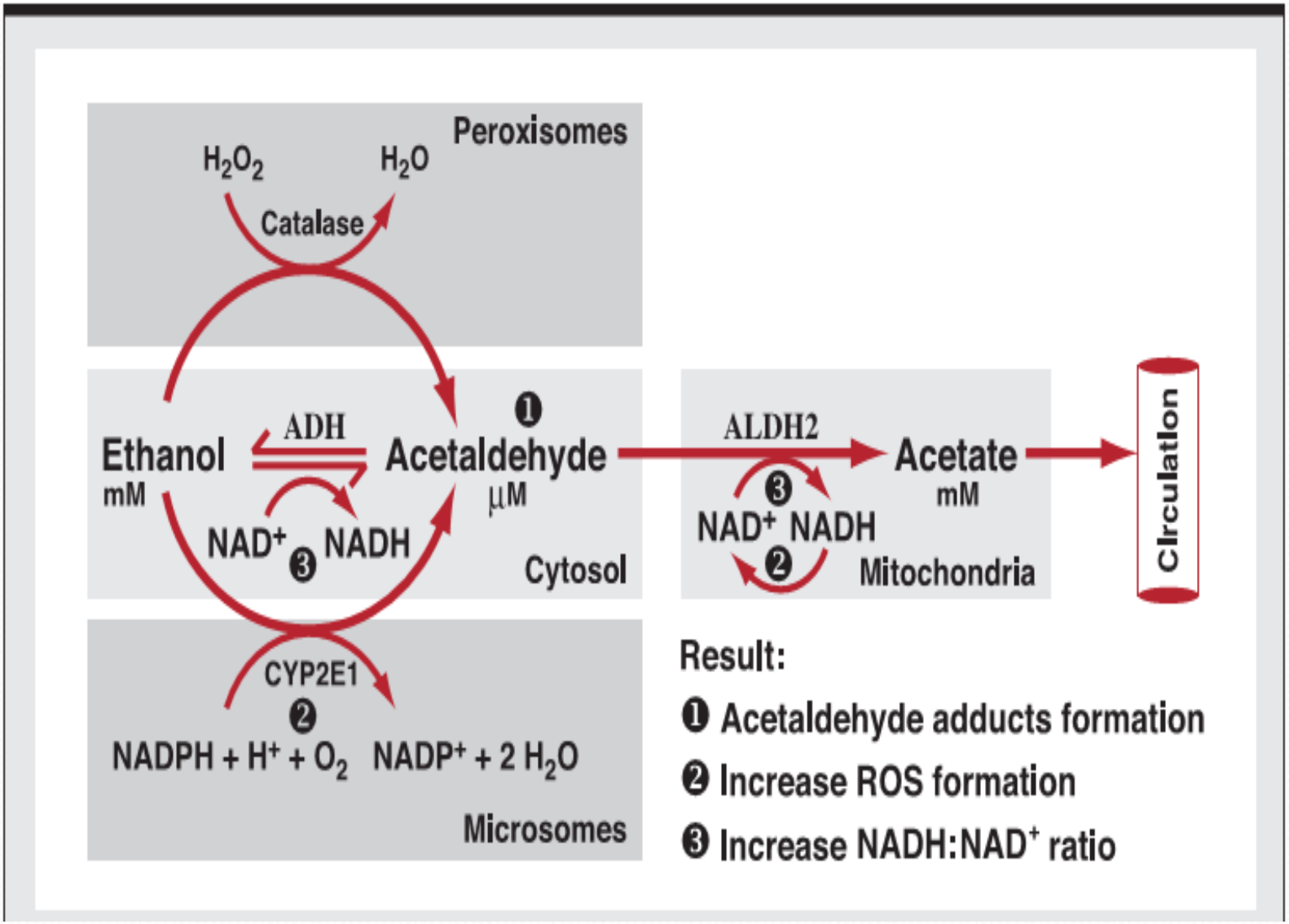
2nd yr PG

General medicine

INTRODUCTION

- Alcohol (beverage ethanol) distributes throughout the body, affecting almost all systems and altering nearly every neurochemical process in the brain.

METABOLISM OF ALCOHOL



Gastrointestinal effects

- Esophagitis
- Esophageal Varices
- Peptic Ulcer Disease
- Mallor-Wiess tears
- Boerhave's syndrome
- Pancreatitis
- Fatty liver: usually asymptomatic
- Alcoholic hepatitis
- Cirrhosis
- GI tumors (esophagus, stomach)

Esophagitis & Gastritis

- Alcohol can cause inflammation of the esophagus and stomach causing epigastric distress, vomitings and gastrointestinal bleeding.

- Violent vomiting can produce severe bleeding through a Mallory-Weiss lesion a longitudinal tear in the mucosa at the gastroesophageal junction

- Boerhave's syndrome

Pancreatitis

- About 50% of all cases of pancreatitis are alcohol related.

- Alcohol has a direct toxic effect on the pancreas, causing changes in the secretions of the pancreas.

- Increase in protein concentration in pancreatic juice - precipitates and clogs the ducts of the organ.

1. Acute pancreatitis (2nd most common cause)

- Most often seen in men, 26-65 years of age, with a minimum of 5-10 years of active drinking.
- Symptoms: Constant, severe epigastric pain which may radiate to the back; nausea and vomiting. Usually begins one or two days after heavy use.
- Physical examination : low grade fever, tachycardia , hypotension , jaundice, erythematous skin nodules, Grey turners and Cullen's sign

Diagnosis: 2/3 criteria

1)Typical abdominal pain in the epigastric region radiating to back

2)Three fold greater elevation of normal amylase and lipase

3)Contrast enhanced computed tomography features suggesting acute inflammation

ATLANTA classification:

Defines phase , severity and CT imaging of acute pancreatitis

Management

- Aggressive fluid resuciation
- Maintain urine output >0.5ml/kg/hr
- Target resusciation –BUN, heamatocrit measurement every 8th hrly
- Adequate analgesia

?Role of antibiotics

Local and systemic complications

Local

- Necrosis
- Pancreatic fluid collection
- Pseudocyst
- Disruption of duct
- Thrombosis
- Pancreatic ascites

Systemic

- Pulmonary
- CVS
- Hematologic:DIC
- Metabolic: hyperglycemia, hypertriglyceridemia , hypocalcemia, purtscher retinopaty
- Renal: ATN , thrombosis

Chronic pancreatitis and exocrine pancreatic insufficiency

- SAPE- sentinal acute pancreatitic event hypothesis

Clinical features

- Abdominal pain
- Malabsortion
- Weight loss

Investigations

- Abdominal CECT-diffuse calcification with duct dilatation is a pathognomic
- MRI
- Pancreatic function tests-secretin stimulation test abnormal when >60%of pancreas is damaged
- Faecal elastase levels <100 microgram/gram of stool suggests severe pancreatic insufficiency

Complications

- Non diabetic retinopathy
- Pancreatic carcinoma (4% over 20 yrs)

Treatment

- Management of steatorrhoea - supplementation of enteric coated pancreatic enzymes(80000-1lakh units of lipase)
- Abdominal pain- improvement of dyspepsia from maldigestion through pancreatic enzyme supplementation
- Role of pregabalin
- Failure of enzyme therapy-gastroparesis(treated by prokinetic drugs)

Effects of alcohol on Liver

Risk factors

- Quantity
- Gender
- Genetic
- Obesity
- Concomitant infections like hepatitis C

Alcoholic fatty liver – alcohol inhibits gluconeogenesis from glycogen decrease fatty acid oxidation leading to steatosis

Alcoholic hepatitis- - Syndrome of necrosis (cell death) and inflammation may occur rapid or over a long period of time.

Cirrhosis – irreversible chronic injury of hepatic parenchyma with extensive fibrosis and formation of regenerative nodules.

Investigations:

LFT

AST/ALT > 3:1 is definative

Increase in GGT

USG abdomen

Biopsy is definative

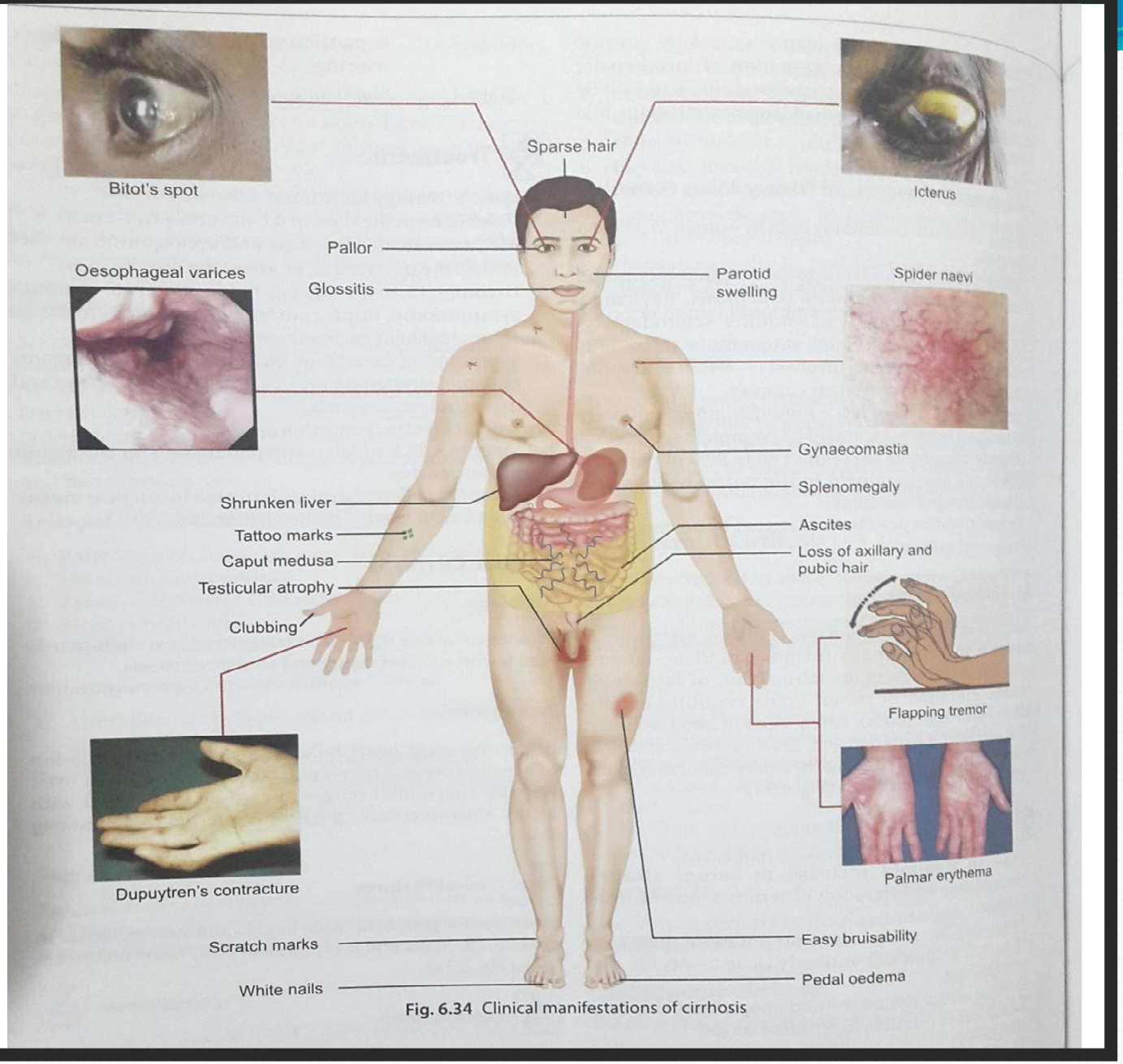
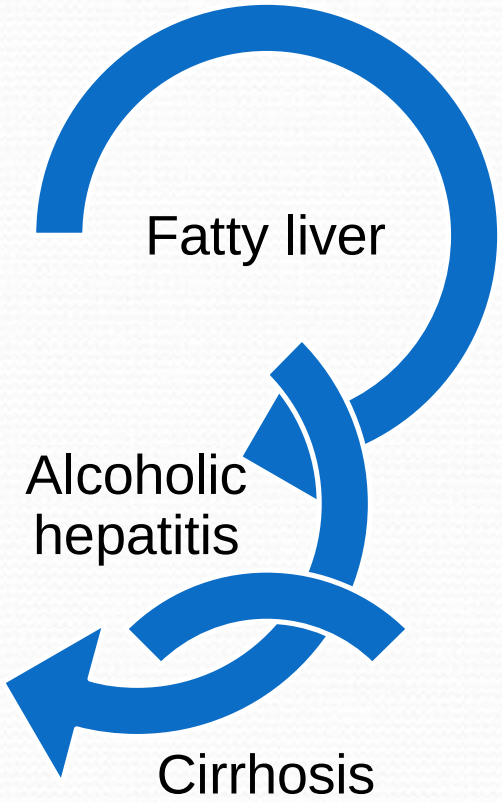
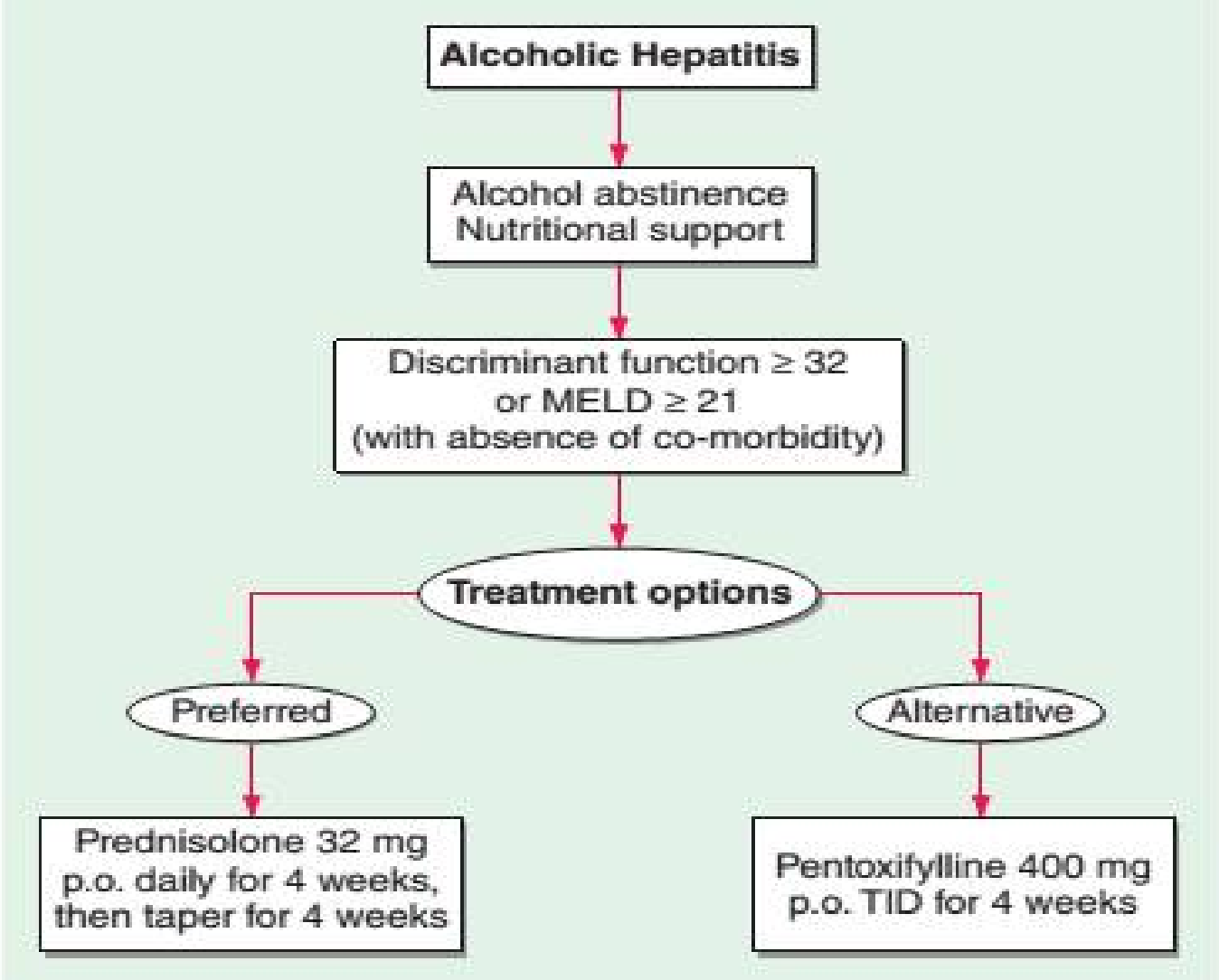


Fig. 6.34 Clinical manifestations of cirrhosis



- Abstinence of alcohol
- Lipid lowering agents
- Glucocorticoids
- Pentoxifiline

Treatment algorithm



Complications of cirrhosis

- Portal hypertension
  - Gastroesophageal varices
  - Portal hypertensive gastropathy
  - Splenomegaly, hypersplenism
  - Ascites
    - Spontaneous bacterial peritonitis
- Hepatorenal syndrome
  - Type 1
  - Type 2
- Hepatic encephalopathy
- Hepatopulmonary syndrome
- Portopulmonary hypertension
- Malnutrition
- Coagulopathy
  - Factor deficiency
  - Fibrinolysis
  - Thrombocytopenia
- Bone disease
  - Osteopenia
  - Osteoporosis
  - Osteomalacia
- Hematologic abnormalities
  - Anemia
  - Hemolysis
  - Thrombocytopenia
  - Neutropenia

Complications of cirrhosis

Portal hypertention

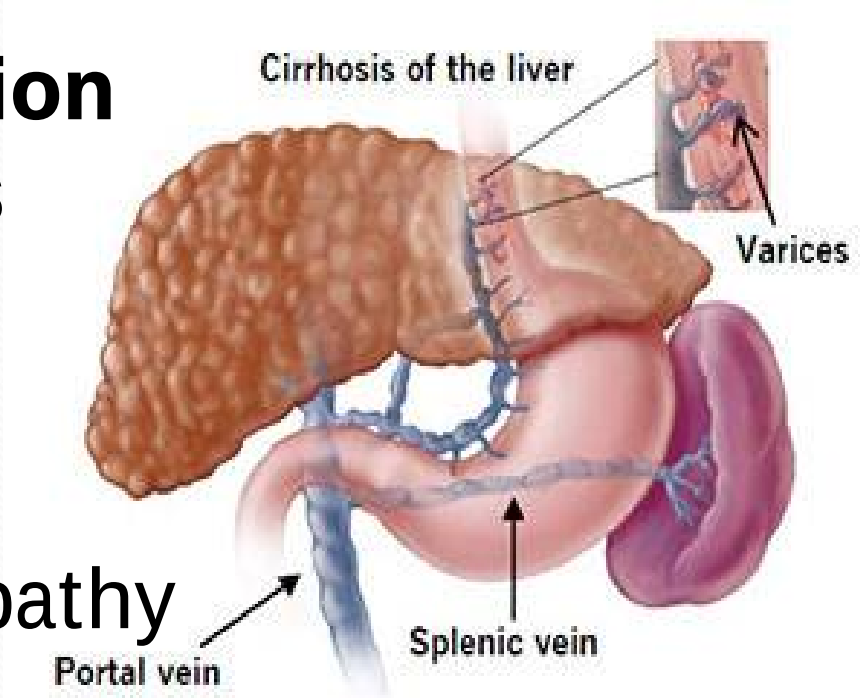
Esophageal varices

Hypersplenism

Splenomegaly

Ascites

Congestive gastropathy



SUSPECTED VARICEAL HEMORRHAGE

Volume resuscitation
+
IV octreotide or terlipressin
(~5 days)

↓

Antibiotics (~7 days)

↓

Endoscopic therapy

↓

No further bleeding

↓

Initiate secondary prophylaxis

Recurrent hemorrhage

↓

Repeat endoscopic therapy

↓

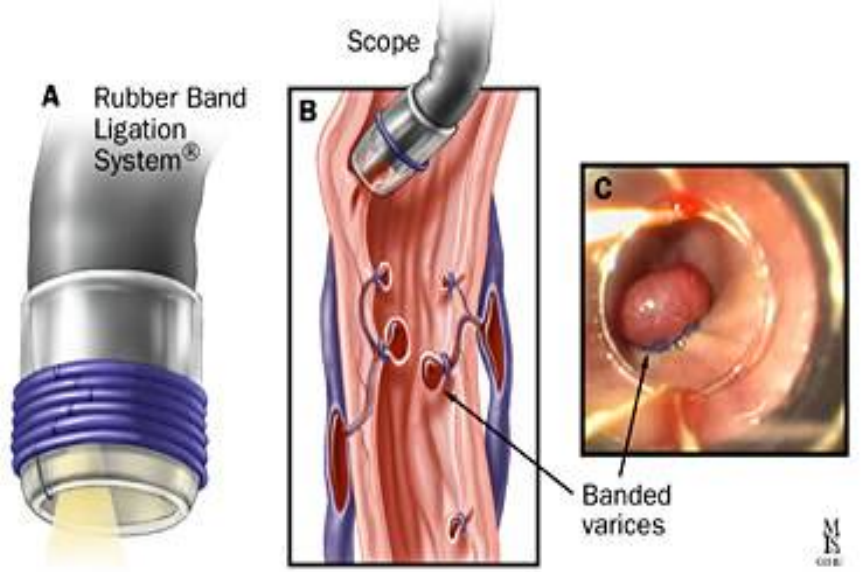
Recurrent or uncontrolled bleeding

↓

Consider balloon tamponade

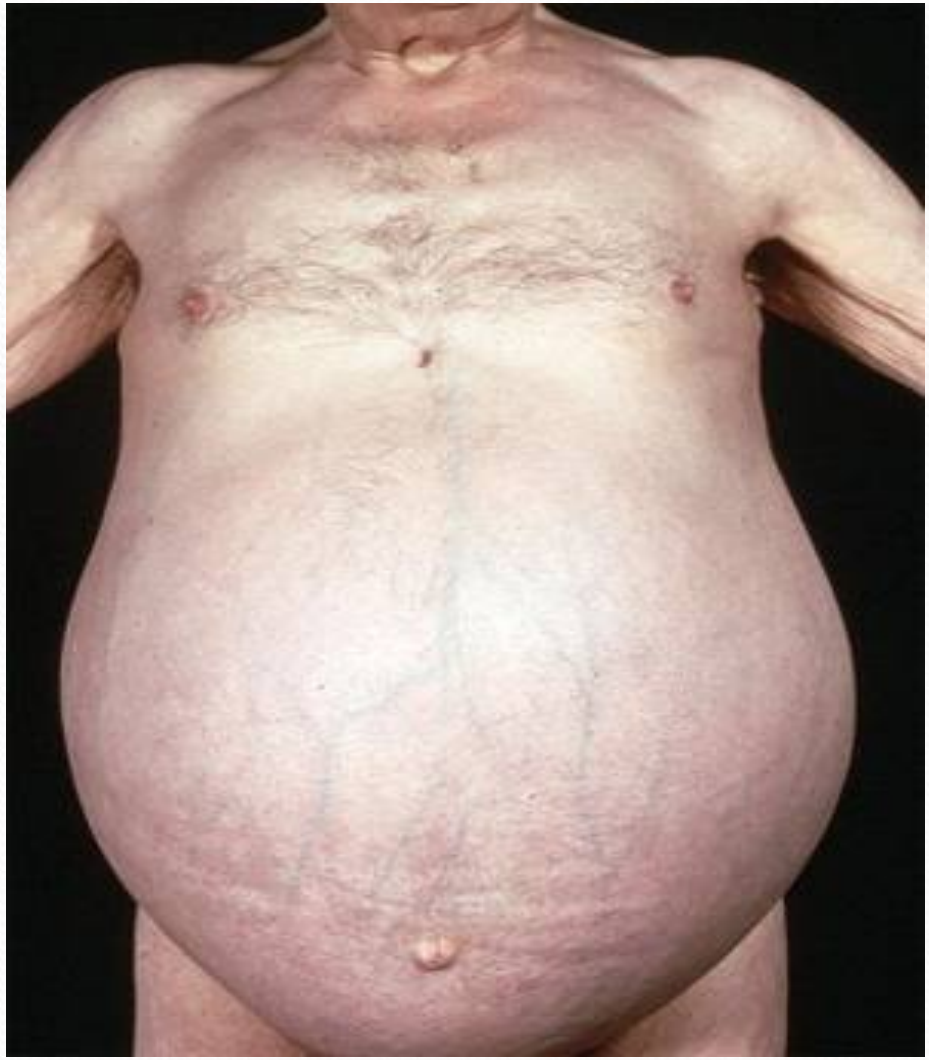
↓

TIPS



Ascites

- Theories of ascites
- Refractory ascites



Alcohol effects on Cardiovascular system

Chronic heavy drinking is a leading cause of cardiovascular illnesses such as

- Cadiomyopathy
- Coronary heart disease (elevated low density lipoprotiens)
- High blood pressure
- Arrhythmias

Cadiomyopathy

- Long-term heavy drinking can cause the heart to become enlarged and lose its ability to contract, a condition known as alcoholic cardiomyopathy

- This condition may be at least partially reversible with abstinence.

- Alcohol's toxic effects on heart muscle may be mediated by increased ROS levels and decreased antioxidant enzyme activity.

Arrhythmias

- Atrial or ventricular arrhythmias especially paroxysmal tachycardia , can also occur temporarily after heavy drinking in individuals showing no other evidence of heart disease-a syndrome known as the "holiday heart."

Alcohol effects on Respiratory system

- Pneumonia: aspiration, decreased airway reflexes, malnutrition, decreased immune response

- Increased incidence of ARDS with systemic illness and trauma

- Depressed local and systemic immunity.

Alcohol effects on Hematopoietic system

- Patients may be anemic either from chronic GI blood loss, nutritional deficiencies, or hypersplenism related to portal hypertension, or as a direct suppressive effect of alcohol on the bone marrow

- Chronic alcoholism is accompanied by folic acid deficiency, there can also be hyper segmented neutrophils, reticulocytosis, and hyperplastic bone marrow.

- A unique form of hemolytic anemia (with spur cells and acanthocytes) called *Zieve's syndrome* can occur in patients with severe alcoholic hepatitis

- Alcoholics have mild thrombocytopenia , which usually resolves within a week of abstinence unless there is hepatic cirrhosis or congestive splenomegaly

METABOLIC EFFECTS

- Hypoglycemia: relatively uncommon in acute intoxication(5%)
- Hypertriglyceridemia
- Hyperuricemia
- Hypomagnesemia: diarrhea, poor diet, phosphate depletion, hyperaldosteronism
- Hypokalemia: poor diet, hyperaldosteronism, diarrhea
- Hypocalcemia: poor diet, steatorrhea, vit K deficient
- Hypophosphatemia: poor diet, diarrhea, hypomagnesemia

Alcohol effects on Endocrine system

- Increase in cortisol levels, which can remain elevated during heavy drinking;

- Vasopressin secretion is inhibited at rising blood alcohol concentrations causing diuresis.

- A modest and reversible decrease in serum thyroxine (T4); and a more marked decrease in serum triiodothyronine (T3).

- Chronic alcoholic men show irreversible testicular atrophy with shrinkage of the seminiferous tubules, decreases in ejaculate volume, and a lower sperm count

- In women can result in amenorrhea, a decrease in ovarian size, absence of corpora lutea with associated infertility, and an increased risk of spontaneous abortion

Effects of Ethanol on Nervous system

- Alcohol functions as a central nervous system (CNS)depressant

- Inhibition of subcortical centres RAS
- Cerebral cortex stimulation
- Aggressiveness, excessive activity, and increased electrical excitability

- Similarly, the initial hyperactivity of tendon reflexes may represent a transitory escape of spinal motor neurons from higher inhibitory centers.

- With increasing amounts of alcohol, however, the depressant action involves the cortical as well as other brainstem and spinal neurons

- 1.Alcohol intoxication-drunkenness, coma, paradoxical excitement ("pathologic intoxication"), "blackouts"
- 2. Abstinence or withdrawal syndrome-tremulousness, hallucinosis, seizures, delirium tremens
- 3. Nutritional diseases of the nervous system accompanying alcoholism
    - A. Wernicke-Korsakoff syndrome
    - B. Polyneuropathy
    - C. Optic neuropathy ("tobacco-alcohol amblyopia")
    - D. Pellagra

- 4.Diseases of uncertain pathogenesis associated with alcoholism

  A. Cerebellar degeneration

  B. Marchiafava-Bignarni disease

  C. Central pontine myelinolysis

  D. "Alcoholic" myopathy and cardiomyopathy

  E. Alcoholic dementia

  F. Cerebral atrophy

  V. Fetal alcohol syndrome

- 5. Neurologic disorders resulting from cirrhosis and portal-systemic shunts
    - A. Hepatic stupor and coma
    - B. Chronic hepatocerebral degeneration
- 6. Traumatic brain lesions acquired during intoxication subdural hematoma, cerebral contusion

Alcohol Intoxication

- Approximately 35% of drinkers (and a much higher proportion of alcoholics) experience a blackout, an episode of temporary anterograde amnesia, in which the person forgets all or part of what occurred during a drinking evening

- Heavy drinking can also be associated with headache，thirst, nausea, vomiting and fatigue the following day, called as hangover syndrome

Mild : vomitings, confusion, disorientation, ataxia

Moderate to severe : seizures, irregular breathing , hypothermia, stupor , coma

Blood Alcohol Level poorly correlates with intoxication because of tolerance.

Go through causes of altered LOC (DON'T JUST ASSUME ethyl alcohol): Structural vs Metabolic causes.

Mild intoxication

- Observe until clinically sober

Moderate - Severe intoxication

Maintain airway, breathing, circulation

- Thiamine 100 mg IV
- Magnesium 2gm iv for chronic drinkers
- D5,NS rehydration (dextrose b/c of risk of hypoglycemia)
- The use of hemodialysis should be considered in comatose patients with extremely high blood alcohol concentrations (>500 mg/dL), particularly if accompanied by acidosis

Who requires a CT head?

- Any significant sign of trauma to head
- Worsening neurologic status
- Focal neurologic findings

Failure to improve within a few hours

Alcohol withdrawal Syndrome

- This is the well-known symptom complex of tremulousness,hallucinations, seizures, confusion, and psychomotor and autonomic overactivity.

- They become manifest only after a period of relative or absolute abstinence from alcohol-hence the designation abstinence, or withdrawal syndrome.

- The full syndrome is called as delirium tremens

Pathogenesis

- The relationships between greater GABA and diminished NMDA receptor activity during acute intoxication and diminished GABA with enhanced NMDA actions during alcohol withdrawal explain much of intoxication and withdrawal phenomena.

Tremulousness

- The most common single manifestation of the abstinence syndrome is tremulousness, often referred to as "the shakes" or "the jitters,“
- Usually seen in morning after night abstinence with GI upset, peaks within 24-36 hours after complete cessation
- It is of fast frequency (6 to 8 Hz), slightly irregular, and variable in severity, with emotional liability

Withdrawal seizures

- In the setting o f alcohol withdrawal either as relative or absolute abstinence following a period of chronic inebriation, convulsive seizures are common mostly GTCS

- > 90 % of withdrawal seizures occur during the 7- to 48-h period following the cessation of drinking, with a peak incidence between 13 and 24 h.

- During the period of seizure activity, the electroencephalogram (EEG) is usually abnormal, but it reverts to normal

- The term rum fits, or whiskey fits sensitive to stroboscopic stimulus

- I.V diazepam or sodium phenobarbital early in the withdrawal period prevent withdrawal fits in patients with a previous history of this disorder.

- No need for antiepileptic course.

Delirium tremens

- This is the most dramatic and grave of all the acute alcoholic illnesses.

- It is characterized by profound confusion, delusions, vivid hallucinations, tremor, agitation, and sleeplessness with signs of increased autonomic nervous system activity.

Treatment

- A wide variety of drugs are effective in controlling withdrawal symptoms.
- The more popular ones have been chlordiazepoxide (Librium), diazepam (Valium)
- Ancillary medications, clonidine and beta adrenergic blockers, and a number of anticonvulsant drugs such as gabapentin, which may reduce the requirement for sedative drugs

Peripheral Neuropathy accompanying alcoholism

- Chronic high doses cause peripheral neuropathy in 10% of alcoholics: similar to diabetes, patients experience bilateral limb numbness, tingling, and paresthesias, all of which are more pronounced distally.

- Vitamin B deficiency, especially thiamine, leads to peripheral neuropathy

- Vitamin B deficiency leads to impaired production of the enzymes needed for maintaining the myelin sheath of the nerves.

- Almost all alcoholics have *burning in the feet, absent ankle jerks, and loss of pain sensation in feet* all due to peripheral neuropathy

- Treatment should include B vitamin complex

Wernicke's Encephalopathy

- Thiamine deficiency (thiamine necessary for glucose metabolism in the brain)
- Triad : **D**elirium, **O**pthalmoplegia, **A**taxia (Triad is inconsistently present)
- Medical emergency, mortality 20%
- Ocular disturbance: nystagmus, VI th nerve palsy, conjugate gaze paralysis
- Ataxia: broad-bade gait and ataxia,

- Mental Status Changes: quiet, confusional state, apathetic, inattentive, indifference, reduced spontaneous speech, communication difficulty.

- Pathology is periventricular hemorrhage

- **Thiamine before glucose**: theoretic risk of glucose precipitating Wernicke's encephalopathy in the presence of thiamine deficiency

- Treatment is thiamine replacement and supportive care

Korsakoff's Psychosis

- Disabling memory disorder +/- cognitive impairment
- Confabulation is the hallmark but is not essential for the diagnosis.

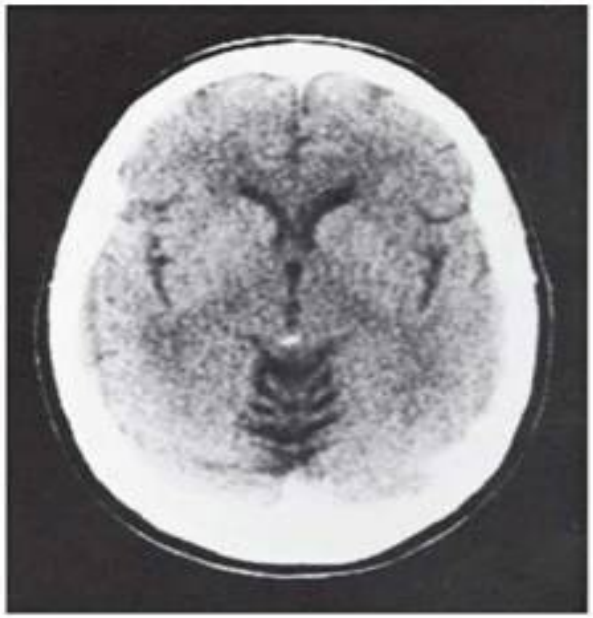
- Confabulation b/c of severe loss of short term memory :. they fill in the gaps with confabulations. Repetition, etc is normal.

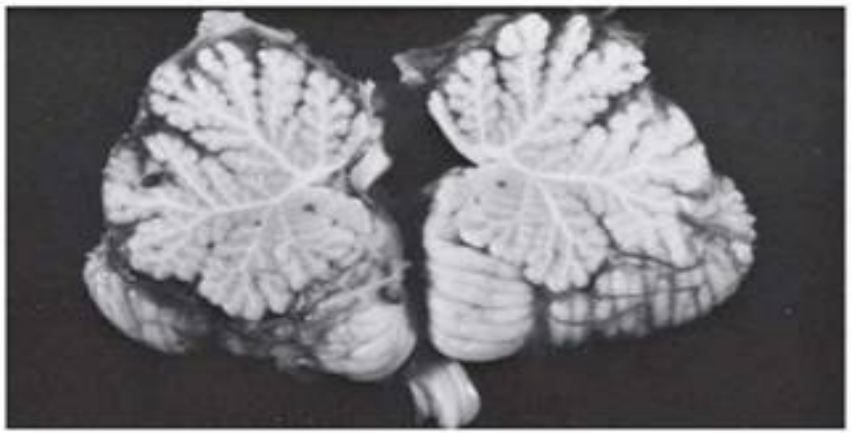
- Pathology is thalamus and mamillary body damage which disrupts the **Papez Circuit**
- Treatment is thiamine replacement and supportive care

Cerebellar degeneration

- Approximately 1 % of alcoholics develop cerebellar degeneration or atrophy. neuroimaging studies reveal atrophy of the cerebellar vermis

- Wide based gait, truncal instability, ataxia of the legs with relative preservation of the upper limb coordination, mild nystagmus



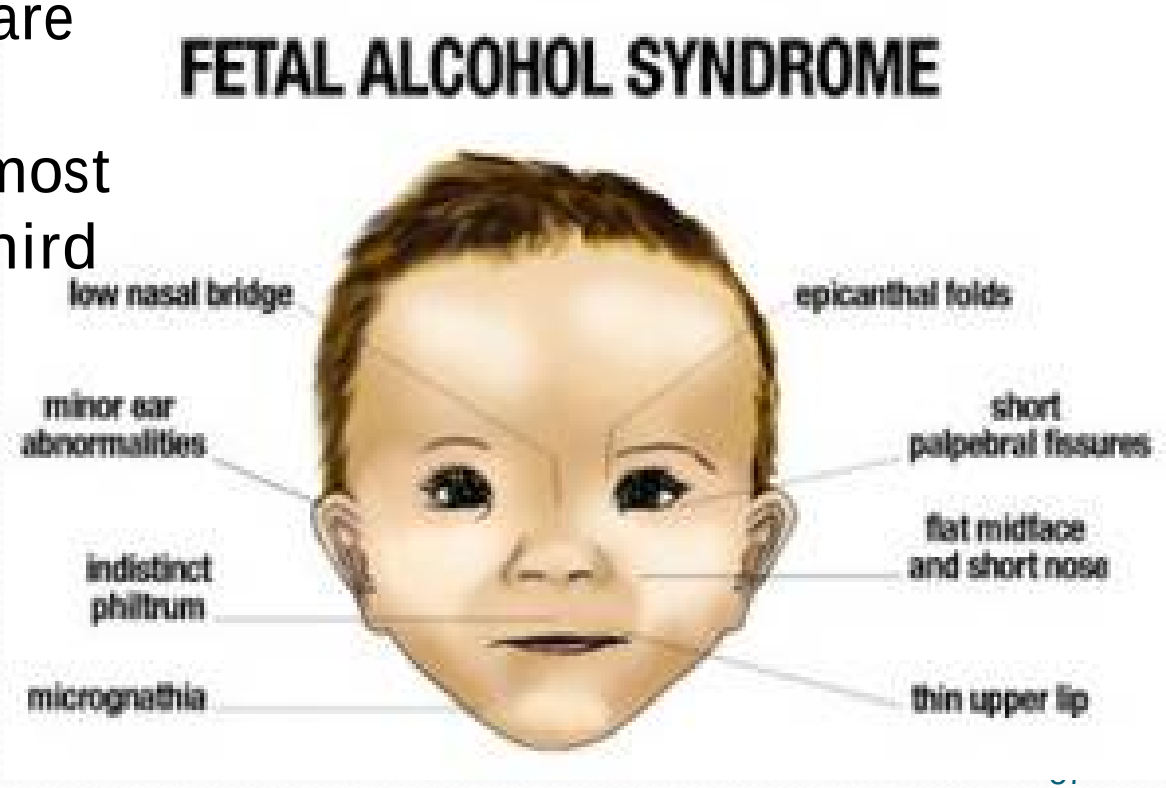


- Pathology is the degeneration of the superior vermis which is responsible for the lower limb hence the sparing of the upper limb

- Neuroimaging studies reveal atrophy of the cerebellar vermis

Fetal alcohol syndrome

Parental alcoholism may have a n adverse effect onthe offspring most of them are small in length in comparison to weight, most of them fall below the third percentile for head circumference



Musculoskeletal system

- Acute alcoholic myopathy
- Long-term alcohol _ increased levels of enzyme serum creatine phosphokinase,

Symptoms:

- Sudden onset of weakness may be acute pain in skeletal muscles; Follows drinking bout;
- Involves proximal muscles, extremities, pelvic and shoulder girdle, muscles of the thoracic cage.

- Osteoporosis and osteopenia
- Alcohol inhibits osteoblastic activity and increases osteoclastic activity causing osteoporosis of the bone finally resulting into fracture and necrosis of the bone
- Abstinence is treatment of choice
- Bisphosphonates

THANK YOU