

### Abnormal Liver Enzymes

- Abnormalities detected in asymptomatic individuals frequently
- Abnormal serum transaminases (ALT>55) were detected 0.5% (99 of 19877) of Air Force recruits, a cause was found in only 12/99
- Cut off of normal should be adjusted by BMI and gender

### History

- Use or exposure to any chemicals or medications
- Duration of LFT abnormality
- Sign and symptoms of liver disease (jaundice, arthralgias, myalgias, rash, anorexia, weight loss, abdominal pain, fever, pruritis, changes in urine or stool)
- Possible IV exposures (transfusions, tattoos, IV/intranasal drug use, body piercing, sexual activity)
- Travel Hx
- Exposure to people with jaundice
- Exposure to contaminated food
- Etoh use

### Physical Exam

- Temporal and proximal muscle wasting suggest longstanding disease
- Stigmata of chronic liver disease (spider nevi, palmer erythema, gynecomastia, caput medusae)
- Dupuytren's contractures, parotid gland enlargement, and testicular atrophy are commonly seen in advanced Laennec's cirrhosis
- Enlarged left supraclavicular nodes (Virchow's node) or periumbilical nodule (Sister Mary Joseph's nodule) suggests abdominal malignancy
- JVD suggests hepatic congestion
- Abdominal Exam: Liver, spleen, evaluate for ascites, evaluate for Murphy's sign

### Laboratory data

- Divided into hepatocellular injury and cholestasis
- Hepatocellular injury shows disproportionate elevation of transaminases in comparison to alk phos while cholestasis shows the opposite, bilirubin can be elevated in both processes
- Transaminases >25X normal → hepatocellular
- Albumin and PT reflect liver synthetic function
- Bilirubin in the urine reflects direct hyperbilirubinemia; can be early sign of liver damage

### Mild chronic elevations in serum aminotransferases

- Chronic (>6 months)
- Mild (<250)
- Step 1:
  - Assess etoh (AST/ALT >2:1 but <300 suggests; in one study 90% of patients with this ratio or greater had alcoholic liver disease)
  - HBV S ab and Ag, HBV core Ab,
  - HCV ab,
  - Hemochromatosis: Fe/TIBC (if >45% → Ferritin >400 in men, >300 in women suggests the diagnosis),
  - RUQ u/s to assess for fatty liver (mild elevations, especially women, DM)
  - Careful medication history (antiSz, antiTb, NSAIDS, Antibiotics, herbals, statins)
- Step 2:
  - Look for non hepatic causes for elevation
  - Muscle D/O: inborn errors, polymyositis, heavy exercise → CK aldolase
  - Thyroid d/o: can elevate transaminases by unclear mechanism → TSH
  - Celiac Dz: undiagnosed antigliadin ab
  - Adrenal insufficiency associated with 1.5-3X elevations
- Step 3:
  - Identifying rare liver causes
  - Autoimmune hepatitis: young woman: SPEP shows polygammopathy usually >2X → ANA, antismooth muscle Ab, LKMA
  - Wilson's Dz (usually presents 5-24 yo but can be up to 40 yo) → serum ceruloplasmin (reduced in 85%), ophtho exam for Kayser-Fleischer rings, 24 hr urine for cooper excretion (>100mcg suggests)

- Alpha-1-antitrypsin deficiency: alpha1 antitrypsin level
- Step 4:
  - who to observe: if < 2 fold increase and no evidence of chronic liver disease
  - who to biopsy: if > 2 fold with no clear etiology
- Isolated hyperbilirubinemia
  - Unconjugated
    - Hemolysis
    - Impaired conjugation:
      - Gilbert's: 3-7%, especially white males; reduced UDP glucuronosyl transferase activity
      - Crigler-Najjar (Type 1, no enzyme, neonates, very rare; type 2- reduced enzyme rare can present in adulthood)
  - Conjugated
    - Dubin-Johnson and Rotor → presents with mild hyperbilirubinemia 50% direct
- Isolated alk phos
  - Derived from liver and bone
  - Elevated in third trimester if pregnancy secondary to placental alk phos
  - Can be elevated in pts with type O or B blood after a fatty meal secondary to intestinal alk phos
  - Increase with age; increased during periods of high bone growth
  - Check isoenzymes
  - If from hepatic sources: RUQ u/s to r/o obstruction, antimitochondrial ab (PBC)
  - Bx recommended if AMA negative and alk phos > 50% above normal for > 6 months
  - If alk phos < 50% elevated and pt is asymptomatic → observation
- Isolated GGTP
  - GGTP is very sensitive but not very specific
  - Other conditions associated with elevation: pancreatic Dz, MI, COPD, DM, etohism, dilantin and barbiturate use
- Cholestasis
  - First: RUQ u/s
    - No dilation → intrahepatic cholestasis
    - Dilation → extrahepatic cholestasis
      - Choledocholithiasis most common cause