Case-based learning session
NASH

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Case Presentation

- A 45 yr hispanic male complains of fatigue. He has been laid off from work and has been home for last 3 months. Prior to that he worked as an emergency medical technician. During this time, he has gained 12 lbs. He has been previously healthy. On examination, BP is 176/98, he is obese, not jaundiced, has no adenopathy, has normal heart and lung exam, abdomen is obese, ALS 7 cm

Case-continued

- What are some key elements missing from history and exam:
  - H/O alcohol consumption
  - Family h/o liver disease or other diseases
  - H/O diabetes
  - sleep pattern (snoring)
  - nature of fatigue

Lab data

- Hgb; 13 gm/dl
- WBC: 6500/mm3
- Platelets: 150000 √
- Fasting blood sugar: 105 mg/dl √
- Creatinine: 1.1 mg/dl (eGFR 62 ml/min) √
- AST: 135 IU/l √
- ALT: 95 IU/l
- Alk Phos: 122 IU/l

Name the common causes of chronic liver disease in the population

- Obesity-NAFLD-NASH
- Hepatitis C
- Hepatitis B
- Alcohol-related liver disease

What proportion of chronic liver disease progresses to cirrhosis

- 2%
- 5%
- 10%
- 20%
- 50%

What is the leading cause of liver related mortality in europe

- Alcoholic liver Disease (Data from Gates Foundation Global Mortality Study)

What are appropriate next steps to evaluate liver enzyme elevation

Case-continued

- What is the likelihood of this patient having NASH:
  - 70%
  - 20%
  - 100%
  - 5%

NAFLD as a cause of chronic elevation of ALT

Mathiesen et al, Scand J Gastroenterol, 34:85-91, 1999

N= 159

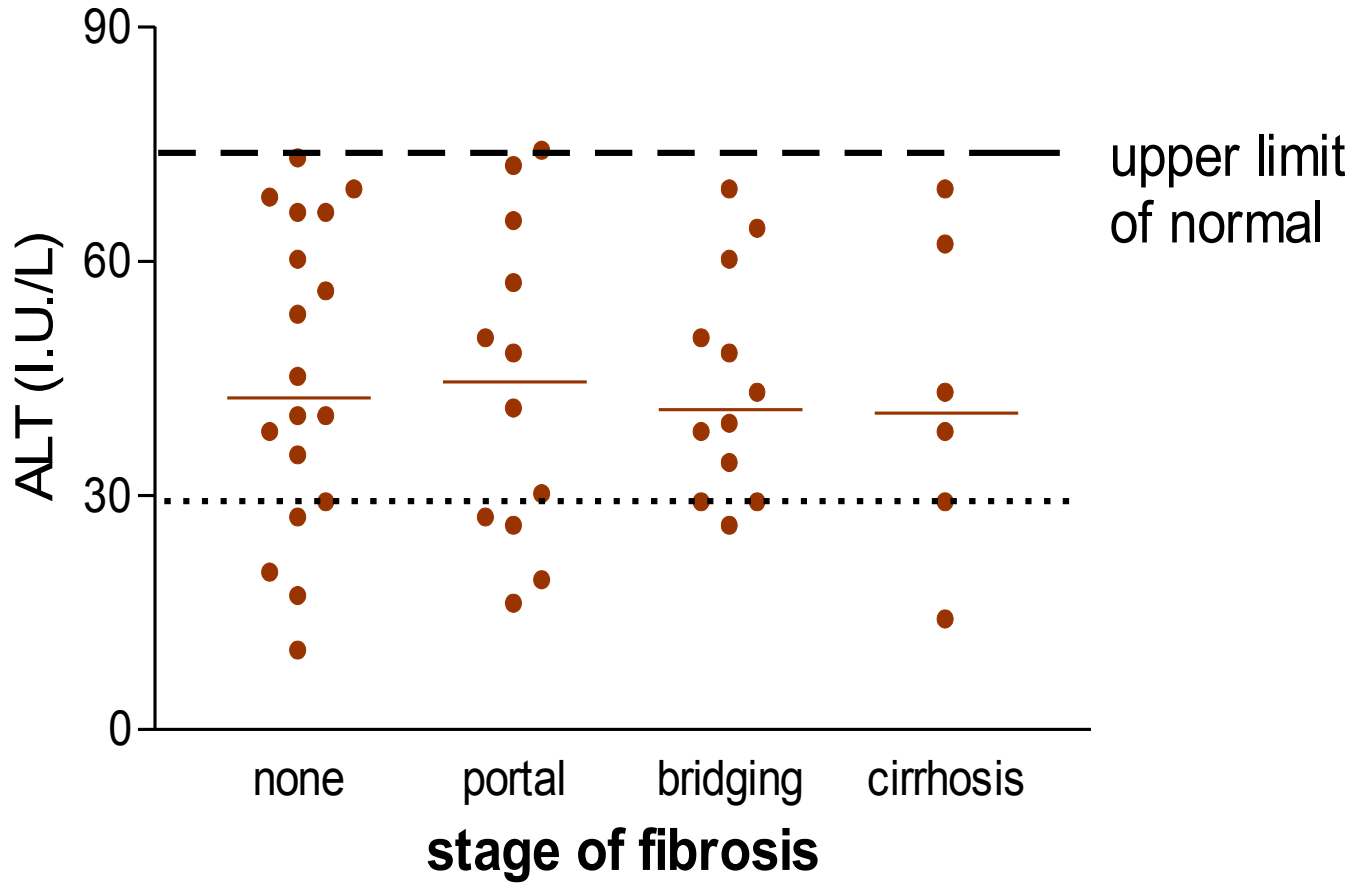
%

Laboratory Abnormalities in NASH

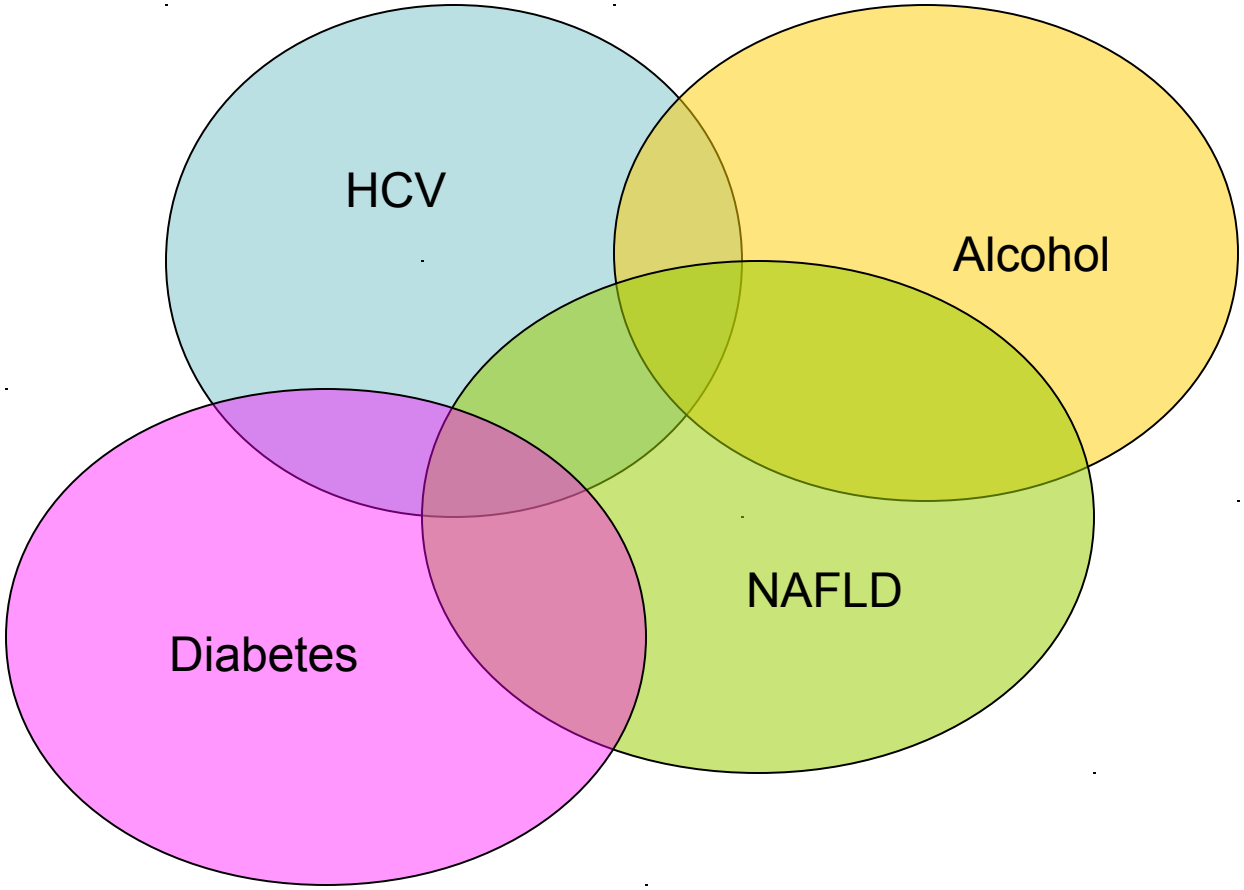
Author	AST (IU/L) Mean or range	ALT (IU/L) Mean or range	AP (IU/L) Mean or range
Adler 1979	48	76	-
Bacon 1994	52-122	64-224	139-202
Angulo 1999	63	82	206

NASH and normal ALT

Mofrad et al, Hepatology, 2003



Relationship of common liver diseases and diabetes



Case continued

- Which clinical features that should make you suspect NASH:
  - right upper quadrant pain
  - fatigue
  - jaundice
  - history of gallstones
  - no symptoms are sensitive or specific

Clinical features of NAFLD

Feature	NAFL (%)	NASH (%)
Asymptomatic	60	55
Fatigue	30	45
Pruritus	2	4
RUQ discomfort	30	32
Hepatomegaly	22	28
Obesity	65	60
Diabetes	45	50
Hypertension	60	65
Dyslipidemia	65	69

Key approach

- Primary elevation is AST and ALT:
  - viral hepatitis
  - alcohol
  - NAFLD
  - autoimmune hepatitis
  - drug-induced injury
- Things to consider:
  - degree of elevation (acute vs chronic injury)
  - pattern of elevation (AST to ALT ratio)

Tests to order for common liver diseases

- HCV: antibody vs PCR
- HBV: HBsAg and HBc antibody
- NASH: ?
- Alcohol: history
- Autoimmune hepatitis: ANA, ASMA
- Wilson disease: ceruloplasmin
- Hereditary hemochromatosis: Fe saturation
- Alpha1-antitrypsin deficiency: AAT levels
- Celiac disease: Tissue trans-glutaminase

Who to evaluate?

- Persistently abnormal AST, ALT or Alk Phos
- Persistent unexplained hepatomegaly
- Abnormal hepatic imaging suggestive of NAFLD

What information are we looking for?

- Is it fatty liver disease?
  - Biopsy or imaging can answer this question
- Is it fatty liver or NASH?
  - Biopsy is the “gold standard”
  - Biopsy is limited by phenotypic variability and difficulties in assessment
- How far has the person progressed towards cirrhosis i.e. fibrosis stage
  - Biopsy is an imperfect “gold standard”
  - Non-invasive markers rapidly gaining ground