NASH: Non-Alcoholic Steatohepatitis
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What is NASH?
- Non-Alcoholic SteatoHepatitis
- Spectrum of disease called NAFLD
  - Non-Alcoholic Fatty Liver Disease

How common is NAFLD?
- The most common cause of abnormal liver function tests in the United States.
- Estimated 30.1 million with NAFLD and 8.6 million with NASH
- Affects 10-24% of the population
  - 58-74% of the obese population
- Affects 2.6% of children
  - 23-53% of obese children

What Causes Fatty Liver Disease?
- Wilson’s disease, alpha-1 anti-trypsin disease, TPN, autoimmune hepatitis, special inherited syndromes, hepatitis C
What Causes NASH?

1st Hit: Obesity
   Insulin Resistance

2nd Hit: Environment
   Genetics
   Oxidants

Who might develop NAFLD?

- Boys more than girls (2:1)
- Teenagers: most diagnosed 11.6-13.5 yrs
  - Now being seen commonly in pre-pubertal children
- Hispanics more than non-Hispanics
- Diabetics (Type 2)
- People with abnormal lipid profiles
- Obese children are at HIGH RISK
  - Obesity: weight >95% for age and sex
  - Centripetal obesity is worse
  - 85% of children with NAFLD are obese
  - At least 50% of obese children have NAFLD

Obesity Trends* Among U.S. Adults

BRFSS, 1985
(*BMI ≥30, or ~30 lbs overweight for 5’4” person)

Obesity Trends* Among U.S. Adults

BRFSS, 1987
(*BMI ≥30, or ~30 lbs overweight for 5’4” person)
Obesity Trends* Among U.S. Adults

**BRFSS, 1989**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)*

- No Data
- <10%
- 10%–14%

**BRFSS, 1991**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)*

- No Data
- <10%
- 10%–14%
- 15%–19%

**BRFSS, 1993**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)*

- No Data
- <10%
- 10%–14%
- 15%–19%

**BRFSS, 1995**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)*

- No Data
- <10%
- 10%–14%
- 15%–19%
Obesity Trends* Among U.S. Adults

**BRFSS, 1997**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)

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Obesity Trends* Among U.S. Adults

**BRFSS, 1999**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)

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Obesity Trends* Among U.S. Adults

**BRFSS, 2001**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)

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Obesity Trends* Among U.S. Adults

**BRFSS, 2003**

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)

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**Pediatric Obesity Epidemic**

- 1963-70
- 1971-74
- 1976-80
- 1988-94
- 1999-2000
- 2004?

**Clinical Presentation**

- Many are asymptomatic
- Routine exam and blood work at pediatrician:
  - Enlarged liver
  - Elevated liver function tests
- In symptomatic patients:
  - Right upper quadrant pain
  - Chronic periembilical pain
- Screening: controversial!

**Physical Exam**

- >90% of patients will be obese
- 1/3-1/2 have an enlarged liver
- 1/3-1/2 will have acanthosis nigricans
  - Dark pigment around nape of neck and axilla
- Other co-morbid conditions
  - High blood pressure
  - Diabetes
  - High cholesterol and lipids
  - Snoring
  - Obstructive sleep apnea

**Acanthosis Nigricans**

- Acanthosis
- Nigricans
Diagnosis
- History of obesity
- History of other co-morbidities
- Physical Exam
- Blood work
  - Liver function tests, fasting glucose and lipid panel, evaluation for other causes of fat in liver
- Radiology Tests: ultrasound or MRI
- Liver Biopsy

Treatment

Therapy
- Weight loss
  - Gradual and progressive
  - Rapid weight loss can make liver disease worse
  - Recommend: 500gm (1 pound) per week
- How to lose weight?

The Old Food Pyramid
The NEW Food Pyramid

Medications

- Large studies to test medicines are under way
  - The studies usually exclude children
- Few open label trials in pediatrics
  - **Vitamin E**
    - 11 pediatric patients treated in San Diego
    - Liver tests improved after 2-4 months
    - Results were temporary
  - **Metformin**: Insulin Sensitizing Agent
    - 10 patients treated for 6 months
    - Improved liver function tests and decreased fat on MRI
- **Actigall** (Ursodiol)
  - No pediatric data
  - Improved liver tests and liver biopsy results

Exercise

Thank you