Recognizing Eating Disorders in the Patient with Gastrointestinal Symptoms

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Eating Disorders (ED)

Anorexia Nervosa (AN)
- Excessive concern with weight/body
- Fear of gaining weight
- Amenorrhea
- Restricting and Binge/Purging subtypes
- Underweight: BMI ≤17.5 kg/m²
- Lifetime prevalence in women: 0.9%

Bulimia Nervosa (BN)
- Excessive concern with weight/body
- Recurrent binge-eating
- Weight-control behavior
- Normal weight
- Lifetime prevalence in women: 1.5%

Clinical Features in Patients with ED

<table>
<thead>
<tr>
<th>System Affected</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Arrhythmia, Bradycardia</td>
</tr>
<tr>
<td>Dermatologic</td>
<td>Dry skin, Hair loss, Russell’s sign</td>
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<tr>
<td>Oral/Pharyngeal</td>
<td>Dental erosions/carries</td>
</tr>
<tr>
<td>Endocrine/Metabolic</td>
<td>Hyponatremia, Hypokalemia, Hypoglycemia, Hypomagnesemia, Euthyroid sick syndrome, Osteoporosis</td>
</tr>
<tr>
<td>Genitourinary/Reproductive</td>
<td>Amenorrhea, Infertility</td>
</tr>
<tr>
<td>Neurologic</td>
<td>Peripheral neuropathy</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>Depression, Anxiety, Personality disorders</td>
</tr>
<tr>
<td>Gastrointestinal (GI)</td>
<td>Abdominal bloating/pain, Constipation, Elevated amylase, Elevated liver tests, SMA syndrome, Gastric rupture</td>
</tr>
</tbody>
</table>


Prevalence of GI Symptoms in ED

- 1,2 Severe gastrointestinal symptoms are seen in 40-80% of inpatients with AN and BN

- 3100 patients with ED completed Rome III questionnaire
  - 83% with at least one functional GI disorder
    - 22% Functional heartburn, 41% IBS, 15% Fecal Incontinence

- 4 Compared to controls, patients with an ED are more likely to seek care for a GI complaint.

Gastric Motility Impairments in ED

Studies Evaluating Gastric Emptying in AN and BN

<table>
<thead>
<tr>
<th>Author</th>
<th>Patients</th>
<th>Method</th>
<th>Results</th>
<th>Treatment</th>
<th>Outcomes of Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Abell et al</td>
<td>8 AN</td>
<td>Scintigraphy</td>
<td>Delayed with solids, not</td>
<td>Nutritional rehabilitation (16</td>
<td>No change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>liquids</td>
<td>weeks)</td>
<td></td>
</tr>
<tr>
<td>2Benini et al</td>
<td>23 AN</td>
<td>Ultrasonographic</td>
<td>Delayed</td>
<td>Nutritional rehabilitation (4</td>
<td>Improvement</td>
</tr>
<tr>
<td></td>
<td>(12 binge/purge, 11 restricting)</td>
<td></td>
<td>and 22 weeks)</td>
<td>(Restricters)</td>
<td></td>
</tr>
<tr>
<td>3Inui et al</td>
<td>26 total (9 AN, 10 AN + BN, 7BN)</td>
<td>Scintigraphy</td>
<td>Delayed with solids</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4McCallum et al</td>
<td>16 AN</td>
<td>Scintigraphy</td>
<td>Delayed with solids, not</td>
<td>Metoclopramide</td>
<td>Improvement</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>liquids (13/16, 80%)</td>
<td></td>
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<tr>
<td>5Stacher et al</td>
<td>16 AN</td>
<td>Scintigraphy</td>
<td>Delayed with solids (13/16,</td>
<td>Domperidone</td>
<td>Improvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>80%)</td>
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</table>


Constipation in ED

- 128 inpatients with ED, constipation seen in:
  - 100% of patients with AN, 67% with BN
  - Transit time decreased in both patients with AN and BN

- Pelvic floor dysfunction can also contribute to symptoms

- Impaired colonic transit can improve with refeeding and weight gain

- Rectal prolapse can be seen in constipated patients with AN and BN

Serious Complications of ED: Superior Mesenteric Artery (SMA) Syndrome

- Obstruction of the 3rd portion of the duodenum due to narrowing of the angle between aorta and SMA
  - Aorto-mesenteric angle ≤ 25°
    - Due to loss of mesenteric fat pad
- Bilious emesis, abdominal pain with distension
- Conservative treatment: TPN, jejunal tube feeds
- Surgery: Intestinal bypass


Serious Complications of ED: Gastric Necrosis

**Gastric Dilation**
(SMA syndrome, Impaired Motility)

- Abdominal pain/distension, inability to vomit

**Gastric Necrosis**
(Intragastric pressure > Gastric venous pressure)

- Worsening abdominal pain, peritoneal signs, sepsis
- Air in gastric wall

**Gastric Rupture**

- High mortality
- Surgical emergency

Serious Complications of ED: Pneumomediastinum

- Free air within the mediastinum
  - Spontaneous
  - Disruption of the GI tract (secondary)

- Can present with diffuse soft tissue emphysema, pneumoperitoneum, pneumothorax

- Symptoms: chest pain, dyspnea, hoarseness

- Treatment:
  - Spontaneous: Conservative management
  - Secondary: Surgical intervention


Abnormal Laboratory Tests in ED

- 1,2,3 Elevated amylase
  - Seen in 25-60% of patient with BN
  - Positive correlation between serum amylase and parotid gland size
  - Secondary to binge-eating and purging

  - *Reports of acute pancreatitis in AN and BN

- 4,5,6 Elevated Liver Tests
  - Mild elevations seen in 4-15% of outpatients and 43% of inpatients with AN
  - Seen more often in patients with lower BMI (<12)
  - Improvement with refeeding

Hepatocellular Injury in AN

Case reports of patients with AN presenting with severe hepatocellular injury

<table>
<thead>
<tr>
<th>Author</th>
<th>Age (yrs)/Sex</th>
<th>BMI (kg/m2)</th>
<th>AST/ALT (U/l)</th>
<th>Total Bili/Direct (mg/dl)</th>
<th>PT (sec)</th>
<th>Albumin (g/dl)</th>
<th>Liver Biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamada et al</td>
<td>22/F</td>
<td>12.6</td>
<td>347/799</td>
<td>0.8</td>
<td>11.4</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Furata et al</td>
<td>20/F</td>
<td>11</td>
<td>5000/3980</td>
<td>2.0</td>
<td>19</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Di Pascoli et al</td>
<td>26/F</td>
<td>10.8</td>
<td>9980/3930</td>
<td>1.4</td>
<td>17.5</td>
<td>4.3</td>
<td>Lipofuscin, Iron deposition</td>
</tr>
<tr>
<td>Di Caprio et al</td>
<td>18/F, 30/F</td>
<td>14, 13.2</td>
<td>1219/1696, 3701/1634</td>
<td>-</td>
<td>-</td>
<td>3, 3.5</td>
<td></td>
</tr>
<tr>
<td>Hunt et al</td>
<td>27/M</td>
<td>14</td>
<td>3969/2576</td>
<td>2.8/2.1</td>
<td>20</td>
<td>3.5</td>
<td></td>
</tr>
</tbody>
</table>


Acute Liver Injury in AN: Role of Autophagy

- 12 patients with acute liver injury (INR >1.7)
- Median BMI of 11.3
- Liver biopsy in all patients:
  - No evidence of hypoxic hepatitis or chronic liver disease
  - Decreased glycogen in all cases
  - Electron Microscopy in 4 patients:
    - Autophagosomes present
- Autophagy may be involved in liver cell death during AN

Evaluation of a Patient with a Suspected ED

• Clinical History
  – Evaluate for weight fluctuations
  – Purging: vomiting, laxative abuse
  – Menstrual history
  – Psychiatric illness

• Physical Examination
  – Low BMI (≤ 17.5kg/m²)
  – Bradycardia, Hypothermia
  – Lanugo-like body hair
  – Dry skin, Russell’s sign
  – Dental erosions
  – Swelling of parotid and/or submandibular glands
  – Dependent edema


Evaluation of a Patient with a Suspected ED

• Laboratory/Tests
  – Serum creatinine and electrolytes
  – Serum glucose
  – Complete blood count
  – Liver tests
  – EKG

• Exclude other medical disorders:
  – Hyperthyroidism
  – Malabsorption
  – Malignancy
  – Causes of secondary amenorrhea

Management of Patients with ED

Outpatient

Inpatient (Severe Symptoms)

• Weight <70% of ideal weight
• Medical instability
• Poor motivation

Mental Health Clinicians
Psychotherapy
Pharmacotherapy

Nutritionists
Nutrition/Weight Management

Primary Care/ Medical Specialty Care


Pathophysiology of Refeeding Syndrome

Malnutrition/Starvation

↑Insulin, ↑Glucacon (Gluconeogenesis)

Refeeding

↑Insulin

↓Sodium

Hypervolemic State: Edema, CHF

↓K, Mg

Arrhythmias, Spasm

↓P

Muscle weakness, Rhabdomyolysis

↓ATP

Anemia

Thiamine

Wernicke-Korsakoff, Beriberi

Management: Nutrition

• Goal: steady rate of weight gain

• Outpatient
  – 800-1200kcal/day, increase by 200-250kcal/week
  – Goal weight gain: 0.5-1kg/week

• Inpatient (Severely malnourished, Risk of refeeding syndrome)
  – Days 1-3: 10 kcal/kg
  – Days 4-10: 15-20 kcal/kg
  – Check and replete:
    • Electrolytes: Phosphorus, Magnesium, Potassium
    • Vitamins: Thiamine, Folate, Pyridoxine, Cobalamin
    • Micronutrients: Selenium, Zinc, Iron
  – Fluid/Sodium balance
  – Monitoring: vitals signs, electrolytes, glucose, weight, EKG


Summary

• Clinical features and complications of ED can involve various organ systems

• GI symptoms are common and non-specific

• Severe complications are and include:
  – SMA syndrome
  – Gastric necrosis/rupture
  – Pneumoperitoneum

• Clinical history and laboratory analysis can assist in establishing a diagnosis

• Management requires a multidisciplinary approach
  – Consider refeeding syndrome in severely malnourished patients