

MALABSORPTION SYNDROME

Definitions

Malabsorption: inability to absorb dietary food. Mucosal barrier to absorption: disease of small intestine.

Maldigestion: deficiency or inactivation of pancreatic enzymes and bile salt. Primary pancreatic exocrine insufficiency.

Classification of the malabsorption syndromes

Impaired digestion

- Gastric surgery
- Gastrinoma

Reduced bile salt concentration

- Liver disease
- Small intestine bacterial overgrowth
- Ileal disease or resection

Abnormalities of intestinal mucosa

- Disaccharide deficiency
- Impaired monosaccharide transport
- Folate or cobalamin deficiency
- Nontropical sprue
- Nongranulomatous ileojejunitis
- Amyloidosis
- Crohn's disease
- Eosinophilic enteritis
- Radiation enteritis
- Abetalipoproteinemia
- Cystinuria
- Hartnup disease

Inadequate absorptive surface

- Short bowel syndrome
- Jejunioileal bypass

Infection

- Tropical sprue
- Whipple's disease
- Acute infectious enteritis
- Parasitic: Giardia, AIDS, helminthiasis

Lymphatic obstruction

- Intestinal lymphoma
- Tuberculosis
- Lymphangiectasia

Cardiovascular disorders

- Congestive heart failure
- Constrictive pericarditis
- Mesenteric vascular insufficiency

Drug-induced

- Cholestyramine, neomycin, colchicin, phenindione, irritant laxatives

Unexplained

- Carcinoid syndrome
- Diabetes mellitus
- Adrenal insufficiency
- Hyper- and hypothyroidism
- Mastocytosis
- Hypogammaglobulinemia, CVID

Clinical and laboratory manifestations of malabsorption

Manifestation	Laboratory findings	Malabsorbed nutrients
Steatorrhea (bulky, light color)	Increased fecal fat, decreased serum cholesterol	Fat
Diarrhea (increased fecal water)	Increased fecal fat or positive bile salt breath test	Fatty acids or bile salts
Weight loss, malnutrition (muscle wasting), weakness, fatigue	Increased fecal fat and nitrogen decreased glucose and xylose absorption	Calories (fat, protein, carbohydrate)
Abdominal distention		
Iron deficiency anemia	Hypochromic anemia	Iron
Megaloblastic anemia	Macrocytosis, decreased vitamin B ₁₂ absorption (⁶⁷ Co-labelled B ₁₂), decreased serum vitamin B ₁₂ and folic acid activity (microbiologic culture)	Vitamin B ₁₂ or folic acid
Paresthesia, tetany, positive Trousseau and Chvostek signs	Decreased serum calcium, magnesium and potassium	Calcium, vitamin D, magnesium, potassium
Bone pain, pathologic fractures, skeletal deformities	Osteoporosis, osteomalatia on x-ray	Calcium, protein
Bleeding tendency (ecchimoses, melena, hematuria)	Prolonged prothrombin time	Vitamin K
Edema	Decreased serum albumin, increased fecal loss of α_1 -antitripsin	Protein (or protein-losing enteropathy)
Nocturia, abdominal distention	Increased small bowel fluid on x-ray	Water

Milk intolerance (cramp, bloating, diarrhea)	Flat lactose tolerance test, decreased mucosal lactase levels	Lactose
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Celiac sprue, non-tropical sprue, gluten-sensitive enteropathy

Response to gluten-free diet. Polypeptide gliadin - offending substance in gluten. Gluten is found in wheat, barley, oats, rye; filler in many prepared foods and medications.

Sprue syndrome

- Disturbed small intestine function - impaired absorption, particularly of fats, and motor abnormalities.

Pathology

- A flat intestinal mucosa without villi in the small intestine.
- Degenerative changes in the myenteric nerve plexuses.
- Loss of villi → loss of microvilli → disaccharidase deficiency (particularly, lactase).

Pathophysiology

- Defective absorption of fat, protein, carbohydrates, iron and water. Impaired absorption of fat soluble vitamins A, D, K. Osteomalacia. Protein loss from small intestine.
- Gluten is found in wheat, barley, oats, rye; filler in many prepared foods and medications.

Clinical symptoms

- In one third of patients with celiac sprue, symptoms begin in early childhood. Symptoms may persist into adult life, but there is usually a latent phase of apparent good health.
- Anemia: hypochromic, microcytic.
- Complications: infantilism, dwarfism, tetany, vitamin deficiency signs, rickets.
- Definitive diagnosis: quantitative measurements of fecal fat (preferably on a known fat intake), characteristic small bowel biopsy.
- Anti-endomysium antibodies
- Dermatitis herpetiformis: frequent association.

Treatment

- Strict elimination of gluten. If no response for gluten-free diet → ? collagenous sprue.
- Diet: gluten-free and initially lactose-free. High-calorie, high-protein, low-fat.
- Prothrombin deficiency: water-soluble vitamin K orally.
- Hypocalcemia or tetany: calcium phosphate or gluconate and vitamin D.
- Macrocytic anemia: vitamin B12
- Corticosteroids: in severe forms.

Prognosis

Proper treatment → good response. A late increased incidence of abdominal lymphomas, carcinomas. Gastrointestinal symptoms while in remission on gluten-free diet → ? cancer.