

Malabsorption syndrome

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- Digestion and absorption of nutrients is a complex
- Less than 5% of ingested carbohydrate, fat and protein is excreted in the faeces.
- ~ arise from defective digestion within the bowel, structural changes in the bowel, or abnormalities in the lymphatic drainage of the bowel.
- The symptoms are diverse and variable in severity.
- Diarrhoea and weight loss in patients with a normal diet--suspicion of malabsorption.

Etiology and pathogenesis

Malabsorption results from

- **Intraluminal maldigestion:** occurs
 1. deficiency of bile or pancreatic enzymes results in inadequate solubilisation and hydrolysis of nutrients--result.
 2. Small bowel bacterial overgrowth. Fat and protein malabsorption
- **Mucosal malabsorption:**
 1. small bowel resection/ damage of SI epithelium---the surface area for absorption and depleting brush border enzyme activity is diminished--

Etiology and pathogenesis

- **'Postmucosal' lymphatic obstruction:**
 1. the uptake and transport of absorbed lipids into lymphatic vessels is blocked.
 2. Increased pressure in these vessels results in leakage into the intestinal lumen, leading to protein-losing enteropathy.

Clinical features

- few patients may have normal bowel habit
- diarrhoea (watery and voluminous)
- weight loss and undigested food in the stool .
- Bulky, loose, pale and offensive, greasy, light coloured stools which are difficult to flush away (steatorrhoea) signify fat malabsorption.
- Steatorrhoea may be absent in any of the diseases of the small intestine.

Table1. Chronic/relapsing diarrhea

	Colonic	Malabsorption	Small bowel
c/f	Blood mucus; lower abdominal pain	Steatorrhea; undigested food; weight loss & nutritional disturbances	Large volume;water; mild abdominal pain
causes	IBD; Neoplasia	Pancreatic (chronic; Carcinoma; Cystic fibrosis) Enteropathy (lymphoma; coeliac disease)	VIPoma; Drugs induced (NSAID; Aminoglycoside etc)
Inves.	Sigmoidoscopy; barium enema/colonoscopy	USG;CT; ERCP; Small bowel biopsy; barium follow through	Stool volume; gut hormone profile; barium follow through

Clinical features

- **Abdominal symptoms:** Abdominal distension, borborygmi, cramps, and distension. Discomfort may follow food intake/ or may be relieved by defecation
- **Nutritional deficiency:** deficiencies of specific vitamins, trace elements and minerals (e.g. calcium, iron, folic acid) may occur. **Anaemia** due to iron, folate or vitamin B12 deficiency, **Bleeding** due to increased prothrombin time secondary to vitamin K deficiency, or **Bone disease** secondary to vitamin D deficiency.

- **Features of general ill health:** anorexia, weight loss, lethargy, dyspnea, and general irritability. hypoalbuminaemia, edema, electrolyte deficiencies, and dehydration, may amenorrhoea, infertility/ impotence.
- **Features related to the underlying cause:**
 1. Abdominal mass- intestinal lymphoma or regional enteritis;
 2. the dermatological changes of scleroderma;
 3. facial flush and large liver : carcinoid syndrome,
 4. signs of hypo- or hyperthyroidism, neurological impairment; lymph node enlargement, arthritis and lung disease etc

Investigation

To confirm/determine the cause

- *Routine blood test in malabsorption:*
 1. Hematology investigation: microcytic anemia (iron deficiency); macrocytic anemia (folic/B12 defi.) prolonged PT (Vit K defi).
 2. Biochemistry: Hypoalbuminaemia; hypocalcemia; Vit D defi; hypomagnesia; deficiencies of phosphate/zinc etc.

Investigation

Test for fat malabsorption:

- abnormal faecal fat may be inadequate digestion/or inadequate absorption.
- Faeces need to be collected at least five, and the result expressed as average daily excretion. >7-10g/day.
- ¹⁴C - triolin breath test: measure ¹⁴CO₂ in the breath after oral ingestion of radio-labelled fat.

Investigation

Tests to confirm protein malabsorption:

- Protein-losing enteropathy-- intravenous injection of radioactive protein or other substance of similar molecular weight—measure faecal radioactivity.

Investigation

Tests to confirm Vitamin malabsorption:

- Vit B12: The Schilling test consists of an oral dose of radioactive vitamin B12; followed by an intramuscular, large, & flushing dose of non-radioactive vitamin B12; and measurement of urinary radioactivity, which reflects the amount absorbed. Confirmation that a low value is not due to pernicious anaemia or other gastric pathology can be obtained by repeating the test and giving intrinsic factor with the oral dose of vitamin B12. If malabsorption is due to ileal disease, the result will remain abnormal.

- Radiological (barium enema/follow through)/ and colonoscopy and biopsies: generally confirms the cause and the severity

Table 2. An approach to the investigation of malabsorption

?malabsorption
Clinical features of steatorrhea • Blood test: urea, electrolytes, Ca, Mg, immunoglobulins, blood R/E; PT; albumin, folates • ¹⁴ C triolein breath test:
↓ Investigate small intestine • Duodenal biopsy • Barium studies • Sugar permeability: if inflamed can absorb the disaccharides and detection in urine.
↓ Investigate pancreas • Pancreatic function test • USG/CT scan • MRCP/ERCP
↓ Consider bile salt absorption • seHCAT scan: isotopic quantification of 7-day-whole day retention of oral dose of ⁷⁵ Se - labelled homocholyltaurine. >15%: N; <5% abnormal. • serum 7 α -hydroxycholestone: sensitive and specific