Pharmacology

Gastrointestinal Motility: Clinical Presentation and Treatment

Patients with intestinal motility disorders, whether hypomotility or intestinal dysmotility syndromes, might need a diverse array of medications for symptomatic relief. These medications fall into one of the following categories: antibiotics, antidiarrheals, opioid antagonists, cholinergic and promotility drugs. Additionally, antiemetics might be needed as these patients can complain of nausea or vomiting.

Definition

Any alteration in the normal transit of food and secretions in the gastrointestinal tract is considered to be an intestinal motility disorder. Patients with these disorders may develop abnormal intestinal peristaltic movement, intestinal paralysis, spasms, and contractions. Depending on whether the cause is intrinsic to the intestinal neuronal layers or the consequence of a systemic condition, intestinal motility disorders can be either primary or secondary.

Patients with intestinal motility disorders experience abdominal pain, distension, constipation, diarrhea, and/or vomiting. They may also have a fever because of an infectious etiology or dehydration.
Epidemiology

Intestinal motility disorders are sometimes difficult to diagnose. However, it is currently estimated that 30 million people in the United States experience some kind of intestinal motility disorder. These disorders also constitute up to 45% of all gastrointestinal conditions, making them a serious burden on the healthcare system. Fortunately, motility and morbidity associated with intestinal motility disorders are low.

Functional intestinal motility disorders such as irritable bowel syndrome are more common in younger patients (20–40 years of age). Other forms of intestinal motility disorders are not age-specific. These disorders are 3 times more common in women.

Etiology

Although the majority of intestinal motility disorder cases are cryptogenic, several causes have been identified, including the following:

- Chronic intestinal pseudo-obstruction
- Irritable bowel syndrome
- Fecal incontinence
- Constipation

Irritable bowel syndrome is a common cause of functional intestinal motility disorders. Patients can have symptoms related to both the small intestine and the colon.

Patients with a prolonged history of fecal incontinence and constipation are at risk of developing intestinal motility disorders. This risk can be related to diet choices, prolonged stretching of the colon, or dependence on laxatives.

Additionally, several causes of constipation have also been identified, including the consumption of low-fiber foods, pregnancy, psychological issues, hypothyroidism, and anal fissures and hemorrhoids. If the cause can be eliminated, patients may be able to stop using laxatives, after which their intestinal motility disorder-related symptoms are expected to improve.

Laxatives can work in several different ways, as outlined in the table below:

<table>
<thead>
<tr>
<th>Mechanism of Action</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk-forming</td>
<td>Psyllium, methylcellulose, polycarbophil</td>
</tr>
<tr>
<td>Stool-softening</td>
<td>Docusate, glycerin, mineral oil</td>
</tr>
<tr>
<td>Osmotic</td>
<td>Magnesium oxide, sorbitol, lactulose, magnesium citrate, sodium phosphate, polyethylene glycol</td>
</tr>
<tr>
<td>Stimulating</td>
<td>Aloe, senna cascara, castor oil, bisacodyl</td>
</tr>
<tr>
<td>Chloride channel activator</td>
<td>Lubiprostone, linaclotide (indirect via cyclic guanosine monophosphate)</td>
</tr>
<tr>
<td>Opioid receptor antagonists</td>
<td>Methylnaltrexone, alvimopan</td>
</tr>
</tbody>
</table>

Certain genetic polymorphisms in mitochondrial DNA put the carrier at risk of developing constipation and other forms of intestinal motility disorders. Infections can cause abdominal distention, vomiting, and diarrhea. Lactose intolerance or glutenopathy can also cause abdominal pain, malabsorption, and weight loss.
Clinical Presentation

Patients with intestinal motility disorders experience constipation or diarrhea, vomiting, abdominal pain, distention, abdominal colicky pain, frequent defecation, fecal incontinence, fever, signs of dehydration, and gastrointestinal reflux disease.

Additionally, physical examination can reveal signs of other secondary causes of abnormal intestinal motility. These include signs and symptoms of hyperthyroidism, including tremors, fever, high blood pressure, and goiter; and hypothyroidism, including cold intolerance, weight gain, and hoarseness of voice. Patients with hyperthyroidism are more likely to experience diarrhea, while those with hypothyroidism may have constipation.

History taking and physical examination should differentiate between organic causes of abnormal intestinal motility and functional causes such as irritable bowel syndrome.

Diagnostic Work-up

Criteria for diagnosis include the presence of symptoms and signs with ileus, air-fluid levels, or distended bowel on plain radiograph of the abdomen. Patients with obstructive bowel disease due to cancer or benign strictures may also have anemia on complete blood count. Electrolyte imbalance should be excluded, as disorders of potassium and sodium homeostasis can be associated with intestinal motility disorders, namely constipation. Patients with steatorrhea may have pancreatic exocrine dysfunction and therefore should have their stool examined for fat content, in addition to excluding bacterial overgrowth. Tumor markers such as CA-125 and carcinoembryonic antigen should also be checked when cancer is a possibility.

Abdominal X-rays are indicated to exclude bowel obstruction. Air-fluid levels can be seen on organic causes of intestinal obstruction, although abdominal X-rays are usually normal in irritable bowel syndrome. In terms of its cost, computed tomography scan has no diagnostic value.

A barium meal is also needed to evaluate a patient with an intestinal motility disorder. Delays in transit time are common in patients with organic causes of constipation, while normal transit times are common in irritable bowel syndrome.

Endoscopy is also beneficial in patients with constipation or diarrhea, especially when they have occult blood on stool examination. Colonoscopy helps confirm organic causes of constipation such as strictures, tumors, and intestinal paralysis. A biopsy can be taken from suspected lesions to exclude malignancy.

Medications

Certain drugs can cause intestinal motility disorder and therefore should be avoided. Patients who are receiving opioids for pain relief in terminal cancer, for example, are at risk of developing constipation. Methylnaltrexone, a peripheral-acting opioid antagonist, can alleviate opioid-related constipation in these patients.

Cholinergic agonists are indicated in cases of constipation that have no apparent obstructive lesion. Neostigmine inhibits enzymatic destruction of acetylcholine, while bethanechol directly stimulates muscarinic receptors.

Patients with severe constipation or constipation-dominant irritable bowel syndrome may
benefit from promotility or prokinetic drugs. Tegaserod can be used in the treatment of constipation-dominant irritable bowel syndrome, with good results. Tegaserod is a serotonin receptor agonist that works on serotonin receptor 4 but not on 5-HT3 receptors.

Metoclopramide, which increases GI motility, can help patients with vomiting, as it improves the synchrony between the stomach and duodenum.

Patients with mainly diarrheal symptoms should be evaluated for a possible infectious etiology before attempting to start antidiarrheal therapy. Loperamide inhibits intestinal motility and is used in patients with intractable diarrhea. Patients may also benefit from a diphenoxylate and atropine combination, which acts through a narcotic analgesic and anticholinergic mechanism.

Finally, infections are one of the most common causes of acute diarrhea. Ova and cyst examination of the stool, stool white blood cells, and leukocytosis should be excluded, as they are all signs of possible infection. When an organism is identified, antibiotics should be prescribed to target the causative organism.

In some patients, erythromycin can be used as a prokinetic agent rather than for its antimicrobial effects. This antibiotic improves stomach motility in patients with gastroparesis (eg, in patients with diabetes). Erythromycin works as a prokinetic agent because it can mimic the action of motilin, which is responsible for peristalsis movements in the intestine and stomach. IV and oral administration of erythromycin can improve stomach emptying times for liquids and solids in patients with gastroparesis.

Surgical Treatment

Surgery is indicated in patients with bowel perforation or peritonitis. Depending on the diagnosed condition, other surgical options include laparoscopy to remove adhesions, colectomy with or without near-total proctectomy, or total proctectomy.

References


Legal Note: Unless otherwise stated, all rights reserved by Lecturio GmbH. For further legal regulations see our legal information page.