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"Constipation: A Comprehensive Review of Pathophysiology, Diagnosis, and Management

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ABSTRACT:

Constipation is a common digestive problem that can affect people of all ages. It happens when bowel movements become less frequent or difficult to pass. Constipation can have many causes, including diet, lifestyle, or underlying health issues. It can also be short-term (acute) or long-lasting (chronic), and its severity can range from mild to severe. Laxatives are commonly used to induce bowel movements, but their frequent use can disrupt gut motility and microbiota balance, potentially leading to dependency.

Keywords: Constipation, Bowel movement, Gut motility, Microbiota Balance, Digestion.

Introduction

Constipation is a common digestive issue that can cause infrequent, difficult, and painful bowel movements. It can sometimes be severe enough to block the intestines, which may require surgery. Around the world, constipation affects a large number of people, with its prevalence ranging from 1% to 80%, depending on the region. This variation comes from different definitions of the condition and how it's diagnosed. Chronic constipation, which is more common in older people, can significantly affect a person's quality of life and increase healthcare costs. In daily life, many people turn to herbal products for health benefits, and plants are important for providing essential nutrients. It is estimated that 80% of plant species on Earth are part of the Angiosperms (flowering plants), with about 21,000 of these species used for medicinal purposes, according to the World Health Organization (WHO). There has been a growing interest in researching plants and their potential health benefits. In India, the market for medicinal herbs is particularly large.



Fig: constipation

Epidemiology

Constipation is a common condition worldwide, with prevalence rates ranging from 2% to 27% in the general population, depending on diagnostic criteria and study populations. It is **more prevalent in females**, likely due to hormonal influences on gut motility, and it disproportionately affects the **elderly**, where decreased physical activity, polypharmacy, and comorbidities contribute to reduced colonic transit. Constipation is also frequently observed in **pregnant women**, due to increased levels of **progesterone**, which slows gastrointestinal motility.

Pathophysiology of Constipation

Constipation refers to a condition marked by infrequent, challenging, or uncomfortable bowel movements.. The pathophysiology of constipation involves multiple mechanisms affecting the **motility, secretion, and defecation processes** of the gastrointestinal (GI) tract.

1. Altered Intestinal Motility

A. Slow Transit Constipation (STC):

1.Decreased colonic peristalsis and prolonged stool transit time.

2.May result from dysfunction in enteric nervous system signalling or reduced colonic smooth muscle contractility.

3.Common in idiopathic constipation and conditions like Parkinson's disease.

B. Pelvic Floor Dysfunction (Dyssynergic Defecation):

1. Disruption in the coordination of pelvic floor muscles while defecating.

2.Leads to difficulty in stool expulsion despite normal colonic transit.

C. Impaired Water and Electrolyte Absorption

1. The colon plays a role in water absorption to maintain stool consistency.

2.Excessive water reabsorption \rightarrow Hard, dry stools.

3. Causes include dehydration, dietary fiber deficiency, and excessive action of antidiarrheal agents like opioids and anticholinergics.

D. Neurogenic Dysfunction

1. The enteric nervous system, vagus nerve, and autonomic pathways regulate colonic motility.

2.Conditions like **diabetes mellitus (autonomic neuropathy)**, **multiple sclerosis**, **spinal cord injuries**, and **Hirschsprung's disease** disrupt nerve signaling, slowing bowel movements.

E. Hormonal and Metabolic Factors

Hypothyroidism: Decreased thyroid hormones reduce gut motility.
Hypercalcemia: High calcium levels impair neuromuscular activity in the gut.
Diabetes Mellitus: Autonomic neuropathy slows gastric emptying and colonic transit.
Pregnancy: Progesterone relaxes smooth muscle, delaying transit.

F. Structural or Mechanical Obstruction

Colorectal cancer, strictures, rectocele, or anal fissures can physically obstruct stool passage.
Post-surgical adhesions can contribute to impaired motility.

G. Medication-Induced Constipation

1.Opioids: Activate µ-opioid receptors in the gut, reducing motility (opioid-induced constipation).2.Anticholinergics: Reduce peristalsis and secretion.

3.Calcium channel blockers: Inhibit smooth muscle contraction.

4.Iron supplements: Alter stool consistency.

H. Psychological and Behavioral Factors

Chronic stress, depression, or eating disorders can disrupt gut-brain interactions, slowing motility.
Voluntary stool withholding (common in children and elderly) worsens constipation.

CAUSES OF CONSTIPATION:

Constipation usually happens when stool moves too slowly through the digestive system or cannot be removed easily from the rectum. This makes the stool hard and dry. There are many possible causes of chronic constipation:

- 1. **Low-fiber diet and dehydration**: Not eating enough fruits, vegetables, and fiber-rich foods, along with not drinking enough water, can cause constipation. This is usually not serious and can be managed by changing your diet and drinking more fluids.
- 2. High-fiber diet: A fiber-rich diet can aid bowel movements by increasing stool volume and facilitating faster transit through the colon.
- 3. Health conditions: Diseases like diabetes, cancer, neurological disorders, depression, anxiety, and other issues with muscles or the rectum can lead to constipation.
- 4. Medications: Certain medications can cause constipation, including those for diabetes, painkillers (like morphine and codeine), antidepressants, antipsychotics, and iron or calcium supplements. Some medications for blood pressure, cholesterol, and other health problems can also contribute.
- 5. Socioeconomic factors: People with lower income or education levels may be more likely to experience constipation. These factors may be linked to diet, lifestyle, and access to healthcare.
- 6. **Economic impact**: Treating constipation can be costly, and it affects the quality of life. Preventing constipation can help save money in the long run.
- Chronic constipation causes: Some physical blockages in the colon or rectum, such as anal fissures, bowel obstructions, colon cancer, or narrowing of the colon, can slow stool movement. Conditions like rectocele (a bulge in the rectum) or colorectal cancer can also cause constipation.
- 8. Fecal impaction: If constipation goes on for a long time, stool can build up and become stuck in the intestines, causing severe constipation.
- 9. Dairy foods: Eating too much milk, cheese, or dairy products can sometimes cause constipation.

SYMPTOMS OF CONSTIPATION

1.Bloating - Your belly feels full or tight.

2.Stomach pain or cramps – You might feel discomfort in your belly.

3.Feeling sick - You could feel nauseous or not want to eat.

4.Only passing small bits of poop - Instead of a normal amount, you might just go a little at a time.

5.Feeling blocked – Like something is stuck inside.

6.Needing help to go - Some people have to use a finger to get the stool out.

CONSTIPATION DIAGNOSIS:

1. Medical History & Symptoms Check – The doctor will ask about your bowel movements, diet, lifestyle, and any medications you're taking. They'll also check for any serious symptoms (like blood in the stool or unexplained weight loss).

2.Colon Cancer Screening - If needed, doctors may test early to check for colon cancer, especially in older adults or those at risk.

3.Medication Adjustment & Treatment – If certain medicines are causing constipation, the doctor may change them. They might also suggest fiber supplements or mild laxatives (like polyethylene glycol, sodium picosulfate, or bisacodyl) to help.

4.Colonoscopy (**Only If Needed**) – This test is done if there are warning signs like rectal bleeding, anemia, or a family history of colon cancer. A small camera is used to look inside the colon.

5.Anorectal Manometry (ARM) - This test checks how well the muscles in your rectum and anus are working.

6.Balloon Expulsion Test (BET) – A small balloon is inserted into the rectum, and the doctor sees how easily you can push it out. This helps check for muscle issues.

7.Barium Enema X-ray – A special X-ray of the colon is taken after filling it with a contrast liquid to see any blockages or abnormalities.

8.Defecography & MRI Defecography (MRD) - These imaging tests show how your rectum functions when you try to pass stool.

9.Colonic Transit Study – You swallow a tiny capsule that tracks how food moves through your colon. X-rays taken over a few days show if stool is moving too slowly.

10.Surgery (**Only If Needed**) – In very severe cases that don't improve with other treatments, surgery may be considered to fix any physical issues in the colon.

Diagnostic Criteria

Functional constipation is identified when an individual has two or more of the following symptoms for a minimum of three months, with the onset of symptoms occurring at least six months prior to the diagnosis::

- 1. Fewer than three spontaneous bowel movements per week The person has very infrequent bowel movements.
- 2. Straining during at least 25% of defecations Difficulty passing stool, requiring excessive effort.
- 3. Hard or lumpy stools (Bristol Stool Form Scale type 1 or 2) in ≥25% of defecations Stools are dry, hard, or pellet-like.
- 4. Sensation of anorectal obstruction in ≥25% of defecations Feeling like something is blocking the stool from passing.
- Assistance from manual actions is necessary for at least 25% of bowel movements This involves using fingers or hands to help in the passage of stool.

Management of constipation: -

Step 1: Identify the Cause

Dietary Issues (Low fiber, less water)

Lifestyle Issues (Lack of exercise, stress)

Medication Side Effects

Medical Conditions (Diabetes, hypothyroidism, IBS)

Step 2: Start with Lifestyle Changes

Increase Fiber Intake (Fruits, vegetables, whole grains) Drink More Water (6-8 glasses per day) Exercise Regularly (Walking, yoga) Establish a Toilet Routine (Go at the same time daily)

Step 3: Use Home Remedies

Drink Warm Water in the Morning

Eat Natural Laxatives (Prunes, papaya, flaxseeds)

Try Abdominal Massage

Step 4: Use Over-the-Counter (OTC) Medicines if Needed

Bulk-forming Laxatives (Psyllium husk)

Osmotic Laxatives (Milk of magnesia, PEG)

Stimulant Laxatives (Senna, bisacodyl) – use occasionally

Step 5: Consult a doctor if Symptoms Persist

If constipation lasts more than 2 weeks

If there is blood in stool, severe pain, or weight loss

Doctor may prescribe stronger medicines or tests

Remedies for constipation

There are basically 2 types of remedies used in constipation

i. Natural Remedies for Constipation

These are safe and effective ways to relieve constipation without medication.

A. Dietary Changes Increase Fiber Intake

- 1. Eat **fiber-rich foods** like fruits, vegetables, whole grains, nuts, and seeds.
- 2. Good options: Apples, pears, bananas, carrots, spinach, oats, chia seeds, flaxseeds.
- 3. Fiber increases stool volume, facilitating easier bowel movements.

Stay Hydrated

- 1. Aim for a daily intake of 6 to 8 glasses of water to help soften stools.
- 2. Warm water in the morning can stimulate bowel movement.
- 3. Avoid too much caffeine and alcohol, which can cause dehydration. Eat Natural Laxative Foods
- 4. Prunes & Prune Juice Contains sorbitol, a natural stool softener.
- 5. Papaya Contains enzymes that aid digestion.
- 6. Flaxseeds & Chia Seeds Rich in fiber and omega-3 fatty acids that help smooth digestion.
- 7. Bananas (ripe) Good for softening stool.

4. Lifestyle Changes

Regular Exercise

- 1. Walk, jog, cycle, or do yoga for at least 30 minutes daily to stimulate digestion.
- 2. Simple movements like stretching or squats can also help bowel movement.

Toilet Routine & Positioning

- 1. Aim to use the restroom at a consistent time each day to condition your body.
- 2. Squatting or using a footstool (raising legs while sitting) can help pass stool easily. Abdominal Massage
- 3. Gently massage the belly in circular motions to help movement in the intestines.

Reduce Stress & Anxiety

1. Practice deep breathing, meditation, or relaxation techniques, as stress can slow digestion.

II. Medicated Remedies for Constipation

If natural remedies do not work, over-the-counter (OTC) or prescription medicines can help.

A. Over-the-Counter (OTC) Laxatives

Bulk-Forming Laxatives (Fiber Supplements)

Examples: Psyllium husk (Lacti fiber), Methylcellulose \checkmark Mechanism of Action: Adds bulk to the stool, making it easier to pass. Best For: Long-term use, mild constipation.

Side Effects: Gas, bloating if not taken with enough water.

B.Osmotic Laxatives

Examples: Milk of Magnesia, Polyethylene Glycol, and Lactulose ✓ Mechanism of Action: Attracts water to the intestines to help soften stool. Best For: Occasional constipation.

Side Effects: Bloating, diarrhea if taken in excess.

C.Stimulant Laxatives Examples: Senna (Senokot), Bisacodyl (Dulcolax)

Mechanism of Action: Stimulates the intestines to push out stool.

Best For: Short-term use only (not for daily use).

Side Effects: Cramps, dependency if overused.

D. Stool Softeners

Examples: Docusate sodium

Mechanism of Action:: Softens stool, making it easier to pass.

Best For: People recovering from surgery or pregnancy.

Side Effects: Mild stomach discomfort.

E.Suppositories & Enemas

Examples: Glycerin suppository, Fleet enema

Mechanism of Action: Works quickly (within 30-60 minutes) by stimulating bowel movement.

Best For: Severe constipation when other methods fail.

Side Effects: Irritation, should not be used frequently.

F.Prescription Medications (For Chronic Constipation)

If constipation persists for a long time, a doctor may prescribe stronger medications:

- 1. Lubiprostone Enhances fluid in the intestines to facilitate the movement of stool.
- 2. Linaclotide Stimulates bowel movements by increasing fluid.
- 3. **Prucalopride** Helps speed up digestion and bowel movement.

Conclusion

Constipation is a widespread digestive disorder that affects people of all ages, significantly impacting their quality of life. It results from a combination of dietary habits, lifestyle choices, underlying health conditions, and medication side effects. Chronic constipation can lead to severe complications if left

untreated, such as fecal impaction and intestinal obstruction. Proper management begins with lifestyle modifications, including increased fiber and water intake, regular exercise, and stress reduction.

While natural remedies like dietary adjustments and abdominal massage can be effective, some cases may require over-the-counter or prescription medications. Laxatives should be used cautiously to prevent dependency. In severe cases, medical interventions such as anorectal manometry, colonic transit studies, or surgery may be necessary.

Early diagnosis and preventive measures are key to managing constipation effectively. A holistic approach—including diet, hydration, physical activity, and proper medical care—can help maintain gut health and prevent long-term complications. Future research on natural plant-based treatments and gut microbiota balance could offer more sustainable and effective solutions for managing constipation.

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