



Constipation, Colonic Inertia, and Colonic Marker Studies

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Constipation is a common symptom. Treatment for constipation often includes lifestyle modifications such as increasing fluid intake, consuming more fiber, and exercising regularly.

At times, the symptom of constipation can represent serious medical illnesses such as hypothyroidism or diabetes. Structural abnormalities of the colon, like colonic strictures or other diseases of the colon or rectum, may also cause constipation. It is therefore advisable to report constipation to your physician if it is persistent or difficult to manage.

Some individuals who have constipation have a disorder involving the neuromuscular control of the process of defecation. Abnormalities that affect the pelvic musculature, spinal nerves, and the muscles of the anorectal region may result in the development of constipation. Conditions of this type are called defecation disorders and are characterized by straining and incomplete rectal emptying.

A subgroup of people have constipation because of disordered nerves and muscles of the colon itself. In these individuals, movement of fecal material within the colon is markedly delayed. Patients with delayed colonic action (medically termed colonic inertia) have difficulty with moving stool through the colon, which is about 3 feet in length. In patients with colonic inertia, stool may remain stored in the right or middle portion of the colon and not progress adequately to the rectosigmoid colon. It is the rectosigmoid colon that is responsible for the

propulsion and transfer of stool out of the body – the processes involved in defecation.

There are a variety of conditions that may cause slowing of colonic action. Medications such as some antihypertensives, pain relievers containing opioid, antidepressants, antipsychotics, and anticholinergics may all slow colonic action.

Hypothyroidism, diabetes, and some rheumatologic conditions may also decrease the function of the intrinsic nerves and muscles of the colon and produce severe constipation. Finally, there are some individuals that develop colonic inertia without an identifiable cause.

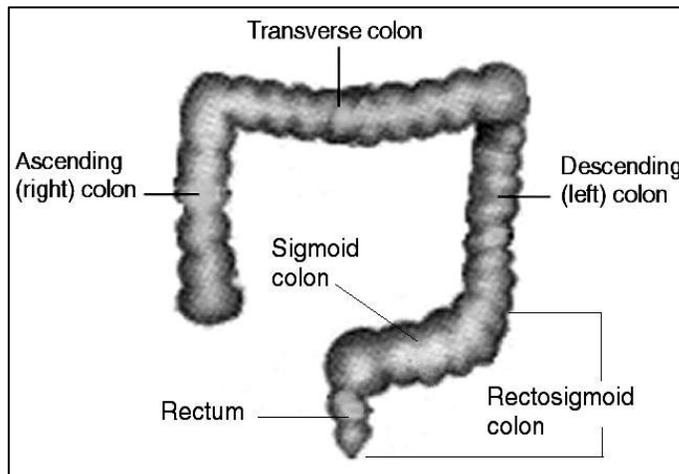
This condition is termed idiopathic. It is seen most commonly in young women.

Colonic Inertia

The symptoms of colonic inertia include long delays in the passage of stool accompanied by lack of urgency to move the bowels. It has been determined that the normal frequency of stool passage in the United States is 3 or more bowel movements per week.

Individuals with colonic inertia often do not pass a stool for 7–10 days at a time. Sometimes colonic inertia is accompanied by abnormalities in motility of the upper intestine including delayed emptying of the stomach and small intestinal pseudo-obstruction [a disorder that causes symptoms of blockage, but no actual blockage].

Because there are a large number of potential causes for the symptoms of constipation, your physician may perform blood tests looking for systemic disease [conditions that affect the entire body, like diabetes], as well as a colonoscopy or barium enema to look for



intrinsic abnormalities of the colon. A review of your medications will determine if you are taking medicines that are affecting the functioning of the colon. Finally, you may have testing of the anorectal function including defecography (a radiographic test to identify anatomical defects during defecation) and/or an electromyogram, or EMG (measures muscle activity) to determine if a disorder of this region is present.

Colonic Marker Studies

Your physician may also have you undergo a colonic marker study, the most common clinical method of examining the rate of colonic movement. This simple test measures the movement of substances that enter and leave the colon over time. The time required to excrete these substances is called colonic transit.

When the colonic marker study was originally developed, a substance such as a dye, which was not broken down in the intestine, was administered by

mouth. The rate of colonic emptying was measured by the duration of time to completely excrete this dye.

Currently, marker studies are more sophisticated. To perform a marker test, a capsule containing a number of tiny rings (usually 24) is ingested by mouth. These rings have been specially treated so that they are clearly visible on an abdominal x-ray. Following ingestion, the capsule dissolves and the rings are released into the small and large intestines. After 12 hours, the rings are usually all present in the colon.

When an x-ray is obtained after 24 hours or longer, the number of rings present in the colon can be counted. Most clinicians take an x-ray 3 and 5 days after ingestion of the capsule. Alternately, x-rays can be performed on a daily basis until all of the rings have been excreted. Based on studies in nonconstipated patients, at day 5, the presence of fewer than 20% of the ingested rings suggests normal colonic transit. If more than 20% of the

Functional Constipation and IBS

Factors that can cause or exacerbate constipation include: poor general health status, use of certain medications, laxative abuse, depression or psychological distress, low fiber diet, or certain medical diseases. *Functional constipation* is diagnosed by the presence of symptoms of constipation in the absence of known causes. The Rome Diagnostic Criteria define the symptoms of functional constipation as the presence of two or more of the following, occurring for at least 12 weeks in the preceding 12 months (As applicable, Nos. 1–5 happen at least 25% of the time when defecating):

- 1) Straining,
- 2) Lumpy or hard stools,
- 3) Sensation of incomplete evacuation,
- 4) Sensation of anorectal obstruction or blockage,
- 5) Manual maneuvers to facilitate defecation and/or,
- 6) Infrequent (fewer than 3) bowel movements per week.

It is important that other medical disorders be excluded, and that persons with symptoms meeting criteria for irritable bowel syndrome (IBS) or other functional gastrointestinal disorders also be excluded.

The diagnostic criteria for *irritable bowel syndrome* are:

Abdominal discomfort or pain that is accompanied by at least two of the following features:

- It is relieved with defecation,
- Onset is associated with a change in frequency of stool, and/or
- Onset is associated with a change in form (appearance) of stool.

In some people, IBS is sub-categorized as *constipation-predominant* as evidenced by a symptom pattern that includes one or more episodes of straining, hard or lumpy stools, and/or infrequent bowel movements. In other people, IBS may *alternate* between constipation and diarrhea. The symptom pattern may then, at times, include the occurrence of one or more episodes of loose or watery stools, the urgent need to have a bowel movement, and/or more than 3 bowel movements per day.

Pelvic Floor Dyssynergia

An example of anorectal dysfunction that can contribute to constipation is a condition called *Pelvic Floor Dyssynergia* (also referred to as anismus). It is marked by the failure of pelvic floor muscles to relax, or a paradoxical contraction of the pelvic floor muscles, with defecation. The pelvic floor is composed of a group of muscles that span the underlying surface of the bony pelvis, which function to allow voluntary urination and defecation. “Paradoxical contraction” refers to an abnormal *increase* of pelvic floor muscle activity with defecation – rather than the normal *decrease* in muscle activity that is necessary in order to have a normal bowel movement. This condition can contribute to some forms of constipation, complaints of incomplete evacuation, and straining with stool.

Because pelvic floor muscles are controlled voluntarily, their function can be improved through various learning procedures – such as biofeedback.

rings are counted on the x-ray, delayed colonic transit is present.

It is important to avoid laxatives for approximately one week prior to and during this study. Their use can alter the results of the study by speeding the movement of the rings in the colon. Also, the role of fiber in the proper performance of marker studies has been investigated. Investigators from the Mayo Clinic have recommended that 10 grams of fiber supplement should be ingested daily during the performance of the marker study.

For a person with constipation, it can be reassuring to know that a marker study shows normal colonic transit. If medical conditions or medications are ruled out as a cause of constipation, treatment such as increased water and fiber intake, following a bowel retraining program (regular and unhurried routine for having bowel movements), and getting adequate exercise may help. If anorectal dysfunction is a cause, biofeedback therapy can help retrain muscles to facilitate release of bowel contents and relieve symptoms.

What should be done if the marker study at day 5 shows an abnormality? Since a variety of causes may result in the development of delayed colonic transit, further evaluation is in order to rule out diseases within the colon, medical disorders, or pharmacologic causes. Additionally, it is often useful to determine whether a defecation disorder involving the pelvic musculature or abnormality of the anorectal region is present. If the only abnormality found after an evaluation is performed is delayed colonic transit, the diagnosis of colonic inertia is made.

Idiopathic Colonic Inertia

Idiopathic colonic inertia is a disorder that most commonly affects females. It often begins at a young age (between age 20–30). This condition can result in severe and stubborn constipation.

Additionally, it is not uncommon for individuals with colonic inertia to begin to use stimulant laxatives [which act on the intestinal tissue to stimulate increased propulsive activity] as a treatment. Most, but not all physicians believe that use of stimulant laxatives on a long-term (chronic) basis can result in additional damage to the nerves and muscles of the lower intestine, and may eventually lead to cathartic colon [a condition where the colon fails to function properly because it has been damaged by the laxatives]. Excess stimulant laxative use can trigger worsening constipation and possible damage to the colon. For example, our group recently showed that 40% of chronic stimulant laxative users, tested by barium enemas, developed signs of cathartic colon. It is important for a patient or physician to recognize this type of chronic laxative use and attempt to use other means, such as adequate consumption of water, dietary fiber and, if necessary, fiber supplements to treat constipation.

Medications

Should dietary changes fail to bring relief, medication may be an appropriate next step. In addition to traditional laxatives, new prescription agents exist for constipation such as tegaserod (Zelnorm) and Lubiprostone (Amitiza). Whether over-the-counter or by prescription, consultation with a physician is advised before long-term or chronic use of them.

Biofeedback Therapy

The role of biofeedback therapy for the treatment of chronic constipation is emerging. Biofeedback therapy involves training the patient, using special equipment to relax pelvic floor and anal sphincter muscles. In constipated patients, biofeedback techniques have generally been used to assist patients having spasms of the pelvic musculature during the act of defecation. In some of these conditions, such as the nonrelaxing puborectalis syndrome, up to 90% of patients have had a successful response to biofeedback therapy. Some authors have suggested that a subgroup of patients with colonic inertia also may improve with biofeedback therapy.

Surgery

Surgical techniques have now been found to be effective in some patients who have colonic inertia. The surgery for this condition involves the removal of the majority of the colon with reconnection of the small intestine to the rectum. In some patients with colonic inertia, this type of surgery may result in complete improvement of their symptoms. A study by Redman et. al. found that 85% of patients with colonic inertia, without other intestinal

motility disorders, are satisfied with the results of this surgery. However, his group also found that when the surgery was performed in patients with upper intestinal motility disorders as well as colonic inertia, only 15% felt that they had received a satisfactory benefit from this surgery. Thus, careful consideration and selection is extremely important to determine which patients will benefit from surgery for chronic constipation.

Summary

Chronic constipation is a common gastrointestinal complaint. It is a symptom, not a disease. It is important to see a physician to determine the cause of the symptom. This is especially important if constipation is accompanied by pain, bleeding, or a recent change in bowel habits.

If organic disease is ruled out as the cause, then changes in diet, increased intake of fiber and liquids, and regular exercise can often help. Discuss the use of any medications with your physician to see if they may be contributing to your symptoms. Once the cause is accurately determined, the most effective treatment plan can begin.

Medications Can Affect Colonic Function

Constipation can be caused by a variety of medications. These medications affect the nerve and muscle activity in the large intestine (colon) and may also bind intestinal liquid. This may result in slowed colonic action (slow and/or difficult passing of stool).

Read all drug packaging and the patient monographs from your pharmacist to find out if the medication or supplement you are taking has the potential side effect of constipation. Also, disclose all of the medications you are taking (both prescription and over-the-counter), vitamins, supplements, and herbal remedies to your doctor when seeking medical advice for constipation. Remember, many readily available "dietary supplements" or herbal remedies are not required to label potential side effects. Do not discontinue the use of any prescribed medications without first consulting your doctor.

Drug Family	Most Common Use	Examples *
Antacids**	Relieve heartburn	Brands containing aluminum
Anticholinergics	Relieve symptoms of Parkinson's, treat depression, anxiety, and nervousness.	propantheline, dicyclomine, amitriptyline, nortriptyline,
Anticonvulsants	Control epilepsy and other seizure disorders	phenytoin, valproic acid
Antidepressants	Treat symptoms of depression	(see also anticholinergics) amitriptyline, imipramine,
Antihypertensives	Lower blood pressure	methyldopa, clonidine hydrochloride
Antipsychotics	Treat symptoms of certain psychoses	haloperidol, clozapine, risperidone
Bile Acid Sequestrants	Reduce cholesterol	cholestyramine, colestipol
Calcium Channel Blockers	Treat angina and high blood pressure	diltiazem, nifedipine, verapamil
Calcium Supplements	Supplement dietary calcium	Caltrate™, PhosCal™
Iron Supplements	Iron deficiency or anemia	Iron-aid™, Chelated iron™
Opiates	Pain Relievers	percocet, darvocet, drugs containing morphine or codeine

This list is not all-inclusive; be sure to consult your doctor or pharmacist for additional information about constipating effects of medication.

** Antacids containing magnesium can speed up colonic action and may be used to treat constipation, under a physician's supervision.

[Adapted from: *Harmful Effects of Medicine on the Adult Digestive System*, National Digestive Diseases Information Clearinghouse, and *Evaluation and Treatment of Constipation*, Scott Harris, MD, IFFGD Publication No. 118]

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