



ABDOMINAL BLOATING: A MYSTERIOUS SYMPTOM

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Abdominal bloating is a very common symptom that affects 10-30% of people. Patients often can't describe exactly what it means and may use a lot of different terms for it. Some may have to loosen their clothes or see distension of their abdomen along with the sensation of bloating, while others feel uncomfortably full but it does not show.

Excessive gas (flatulence), frequent burping (eructation), and abdominal rumbling (borborygmi) are some of the other bloating-related symptoms that may be present in some patients. In a US household survey, 16% of the population reported having bloating or distension, and three quarters of them found it to be moderate to severe. Almost half (43%) reported using a medication for it. Not surprisingly, bloating is much more common in patients with functional gastrointestinal disorders (FGIDs). In one study, 96% of patients with irritable bowel syndrome (IBS) had bloating and 60% of them reported it to be their most bothersome symptom. In comparison, only 29% stated that abdominal pain was the most bothersome symptom.

Though bloating is typically not as serious as abdominal pain from the physicians' perspective, patients often report significant difficulties due to bloating in terms of their ability to work and participate in social or recreational activities. Bloating is also related to increases in sick days, physician visits and medication use.

Which medical conditions can cause bloating?

Although bloating can be due to organic GI diseases, where anatomical or structural abnormalities cause the symptoms, the vast majority of patients who suffer from bloating have one of the FGIDs, namely aerophagia (air swallowing), functional dyspepsia, irritable bowel syndrome, functional abdominal bloating, or functional constipation. Bloating associated with FGIDs relates to abnormalities in the abdominal wall and gastrointestinal (GI) tract motility and abnormal perception of gut sensations (visceral hypersensitivity) rather than structural causes.

Lactose intolerance, Giardiasis (intestinal parasite infection), bacterial overgrowth, malabsorptive conditions (failure of intestinal absorptive capacity) such as celiac disease, gas-bloat syndrome after Nissen fundoplication (a surgical procedure to treat persistent heartburn), and gastric outlet or intestinal obstruction are examples of organic GI diseases that can cause bloating, due to either increased gas production or obstructed gas transport. Some non-GI disease, such as congestive heart failure and cirrhosis of the liver, can also cause bloating by causing fluid accumulation in the abdomen. Bloating can also be a normal part of the symptoms of menstruation.



How does bloating happen?

There are several elements that contribute to bloating. First are physical factors that affect the volume of contents in the abdomen. To understand how this works, it may be useful to imagine two rubber tubes, one within the other one.

If the inner tube is the intestines and the outer tube represents the wall of the abdomen, any change in the volume and pressure of the inner tube would affect the outer tube. Though this may be simplistic, only two sections of the outer tube, the front and side muscles of abdomen and the diaphragm (the muscle under the lungs that separates the chest and abdomen and facilitates breathing movements) actually have room to expand. When the contents in the inner tube (intestines) increase due to solid (hard stool), gas or liquid (liquid stool), three things can happen: the abdomen can expand, the diaphragm can be pushed up higher into the chest, and the pressure in the abdomen can increase.

Some problems -- such as swallowing large amounts of air, delayed emptying of the stomach because of dyspepsia, slow gas transport in the intestines with gas accumulation associated with IBS, and retention of stools due to constipation -- can cause a change in volume of the GI tract (the inner tube) that in turn produces a change in the outer tube, causing the abdomen to be distended. But, in real life, the body tends to counteract this change in volume by either contracting the abdominal muscles (stiffening the abdominal wall) or doing the opposite -- relaxing the muscles to accommodate this increase in volume. This is called the viscerosomatic reflex.

The other key element in causing the symptom of bloating is visceral hypersensitivity or heightened perception of sensations arising in the gut. This hypersensitivity, which is common in IBS, can cause ordinary small changes in the volume of the GI tract to be perceived as bloating, and the accompanying tightening or relaxation of abdominal muscles can also be sensed that way. For these reasons, one may have the sensation of bloating and not have the distension (the abdomen sticking out), depending on how much volume change there is and how the abdominal wall responds to it. Also, some very sensitive people might perceive the sensation of bloating without any volume change in the GI tract at all, for example, merely in response to normal contractions of the gut. Similarly, people with eating disorders such as Bulimia and Anorexia may suffer from bloating that is related to enhanced awareness of normal gut regulatory signals at the level of the brain.

Finally, any increase in the volume between the inner and the outer tube, such as fluid accumulation due to certain conditions such as congestive heart failure or kidney disease where fluid accumulates in the abdomen and legs, can cause bloating with or without distension, or even distension with or without bloating. Occasionally, patients have excessive forward curvature of the lower back (Lumbar spine), giving the appearance of a distended abdomen.



Although more than one mechanism probably operates to produce the sensation of bloating in most patients, in certain clinical conditions one particular mechanism may be predominant, such as the slow transit of bowel contents and fecal retention in constipation or fluid retention and ascities in congestive heart failure.

What can be done about bloating?

Bloating can often be treated effectively if the cause can be determined, but that is not always easy. Usually, other associated symptoms give the physician a clue as to the particular GI disease responsible for the bloating, such as Giardiasis, which can be treated easily with antibiotics. When no apparent cause is found, treatment usually includes avoidance of offending food items, empirical use of drugs, and occasionally psychological therapies, such as hypnosis and behavioral treatments in selected patients.

Several common food substances are known to cause bloating in some individuals. If they are not normally digested, bacteria in the colon degrade these food substances, thus producing gas. Daily intake of dietary fiber, although it helps with constipation, can sometimes contribute to bloating. If that is the case, it should be avoided. Similarly, excessive use of artificial sweeteners or carbonated beverages might cause bloating, and should be avoided. Some people are intolerant to Lactose and Fructose and eliminating these from the diet will be helpful. Certain vegetables such as broccoli and beans can also cause bloating, as the body's ability to digest them is limited. Beano™, which has an enzyme to help digest some complex carbohydrates in those vegetables, may reduce flatulence but does not seem to help with bloating. Other over-the-counter preparations containing simethicone and activated charcoal such as Gas-X and CharcoCaps respectively are still being used for gas and bloating symptoms although their usefulness is questionable.

Some studies of Probiotic preparations containing bacterial species such as Lactobacillus and Bifidobacterium have reported improvement in bloating and flatulence, while others have shown no benefit. In some recent studies, Tegaserod (Zelnorm), a drug which stimulates serotonin receptors in the gut, has been shown to improve bloating in patients with IBS and chronic constipation. This may be related to its effects on promoting intestinal motility. It is worth a try in patients diagnosed with those conditions.

Antidepressants (usually low doses of tricyclic antidepressants such as Amitriptyline or Desipramine) which act by modifying the perception of gut sensations at the higher level of the nervous system can be used in patients with bloating secondary to functional GI disorders. Non-drug treatments have been used in patients with bloating from selected conditions. Hypnosis has been shown to improve (relieve) bloating in patients with IBS. Behavioral treatment by a psychologist may be necessary in patients with Aerophagia.



Conclusions

Bloating is a common and frequently very bothersome symptom in patients with functional GI disorders. Several different causes of bloating have been suggested (malabsorption of sugars, fluid retention, etc), and more research is needed to determine whether these are distinct types of bloating that may require different treatments. Treatment includes avoiding offending food and supplements, as well as identifying and treating the disease that could be contributing to the bloating. Some over-the-counter medications can be tried, but the evidence for their effectiveness in helping bloating is poor. Newer drugs are showing some promise for relief of this symptom. Our efforts to develop a Bloating Diagnostic questionnaire that could distinguish between different causes of bloating proved unsuccessful.

However, we have developed a Bloating Severity Questionnaire and a Bloating Quality of Life Questionnaire that will likely be useful in future research on abdominal bloating.

