

Management of Constipation

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ABSTRACT

Constipation is the most ignored complaint by doctors and unfortunately, it requires urgent management due to the decreased quality of life. Most cases are functional constipation but there is also a great number of constipation due to organic abnormalities. In an attempt to manage the patient properly, we should put our emphasis on excellent knowledge of pathophysiology of constipation. By using the colonic transit time test, we could determine the type of constipation, which would have an effect on therapy. In most cases, constipation has a good response to high fiber diet and additional laxative medication and surgical therapy is seldom required unless complications have occurred. There is also a suggestion for preventing constipation may be caused by opioid usage.

Keywords: *Constipation, colonic transit time test, high fiber diet, laxatives.*

INTRODUCTION

Constipation is a symptom that frequently complained by patient in clinical practice, but most of the time it is not taken seriously by physicians. This happens because it is more considered as complaint than a 'disease' so that it was taken for granted many times. More attention will be given if there has already been a complication or anorectal abnormality such as anal fissure and hemorrhoid.

Back to the old Egyptian period, constipation was explained as autointoxication concept of the body isolated substance from toxic in the gastrointestinal tract.¹ This was proven after the physician had successfully isolated 'substance' from fecal mass in the gastrointestinal tract and injected it to animal model and then it was found toxic and dangerous. This had been a basic concept that the substance could be absorbed into blood circulation. Until the early 20th century the concept of autointoxication had been discussed in many lectures. In addition, constipation was considered as the cause of about 90% of diseases and had poor prognosis.¹ This had implication in the management of constipation. Laxatives agents have been used frequently and in general population, people tend to buy and use it by themselves whenever they think they have constipation.

In the western countries, constipation has become common problem and accounted 2% - 27% of general population. In the US, visiting doctor rate due to constipation had reach 2.5 million per year and about 92,000 cases needed hospitalized.² Constipation was found more in women than in men with ratio of 3:1. Risk factors of constipation are less physical activity, low education, history of sexual abuse and depression. Constipation may occur in all ages and the highest incidence is 30% - 40% in group of age beyond 65 years old.³ This might due to changing pattern of diets, decreased muscle tonus, and drug consumption that cause dehydration or colonic dysmotility.

In Western countries, constipation problem have been reported more in black population than Asians and Caucasians. However, if Asian people have the Western style of diet which contains low fiber, they will have symptom of constipation.

DEFINITION

Constipation is not easy to define, thus, there is no one single definition of it.² Most patients describe constipation by the presence of one or more symptoms of hard stool, irregular defecation (usually less than 3 times per week), excessive straining during defecation, sense

of incomplete evacuation of the rectum and much time spent for defecation. Regarding all things above, in general, constipation can be defined as frequency of defecation 2 times or less per week or excessive straining while defecation. From several studies, it was concluded that normal frequency of defecation was 5 times per week and could varied according to gender and age. There was some opinion of normal frequency of defecation 3 to 12 times per week. For scientific research, criteria used for constipation was according to Roman II criteria as follows:²

- In adult if it is found two or more of the following criterias mentioned below and have been gone for at least 12 weeks (not necessary to be subsequent) in the last 12 months there are excessive straining or at least 25% of all defecations; softened or hard stool in more than 25% defecation; incomplete evacuation of stool in more than 25% of defecations; the presence of anorectal inhibition in more than 25% of defecations; the necessity of hand maneuver to facilitate defecation in more than 25% of defecations; frequency of defecations less than 3 times per week; there is no liquid stool found and symptoms mimicking irritable bowel syndrome
- In babies and children, stool predominantly hard and small in most of defecations for at least 2 weeks and there is no structural, endocrinologic or metabolic disorders

Definite etiology of constipation is difficult to be determined because it is multifactorial and maybe caused by systemic disease, neurologic disorders or drugs. The most frequent cause of constipation nowadays is improper eating habit, structural abnormalities and systemic diseases. Diet pattern that leads to constipation is lack of fiber and fluid especially in elderly.⁴ In severe and refractory constipation which is usually caused by colonic inertia (delayed colon transit) and abnormalities in rectum and pelvic floor. On the other hand, decreased activity may cause constipation. This was based on the fact that the active people who had no constipation before turned to have it when they were not physically active anymore. Most of people have it are the ones who are bedridden or chairbound.⁴ Some drugs may also induce constipation. Some drugs that had been reported are calcium-containing antacid, iron supplementation, anti diarrhea, and opioid drugs.

PATHOPHYSIOLOGY

To date, constipation is classified into 3 categories as follows constipation with normal transit time, delayed transit time and defecatory disorders or rectal

evacuation abnormalities.² This classification is based on observation in 1,000 patients with chronic constipation. Further more, it found that constipation with normal transit time was the most frequent cause followed by defecatory disorder, constipation with delayed transit time and combination of both defecatory disorder and delayed transit time.

Constipation with normal transit time (usually is called functional constipation), the patient has disturbance on stool evacuation or the presence of hard stool. There are no abnormalities in fecal movement in the colon. Patient complains of bloating and abdominal pain and sometimes accompanied by psychosocial problems. Other patient may complain of increased resistance or rectal sensitization while defecation or the combination of these two. These symptoms usually are responsive to treatment of high fiber diet or laxative agent. If there was lack of response to therapy, it needs to give additional therapy. Constipation with delayed transit time has delayed movement of colonic peristaltic (less than once a week). This abnormality is often seen in young women and usually in puberty period. Symptoms commonly found are urgency and irregular defecation time, bloating and abdominal pain. Patient with this kind of disorder have delayed transit in proximal colon and decreased peristaltic contraction. This also have differences in grade of severity. In mild abnormalities, might be caused by low fiber diet and culture factor. Increase in fiber contain in daily diet can increase fecal mass, reduce colonic transit time, and diminish symptom of constipation. In patient with severe abnormalities, additional fiber and laxative agents may give sufficient response. Histopathologic examination reveals changes in some of neuronal plexus myentericus which responsible for neurotransmitter excitation of P substance. Other disorder is inhibitory defect on VIP neurotransmitter and nitrite oxide and decreased number of cajal cells which responsible of gastrointestinal tract motility. Hirschprung disease is an extreme example of this disorder.

Other type of constipation is defecatory disorders; in which there are abnormalities in pelvic floor or anal sphincter. Other term used to describe it was anismus, pelvic floor dysinergia, pelvic floor paradoxal contraction, obstructive constipation, functional rectosigmoid obstruction, pelvic floor spasm syndrome and functional fecal retention (in childhood). This kind of disorder may be caused by habit of postponing defecation because they want to avoid the pain while defecation. This pain is associated with fecal consistency and big volume or the presence of anal fissure or hemorrhoid. Other rare causes of structural disease are

rectal intussusceptions, rectocele, sigmoidocele obstruction, and perineal collapse.

In elderly, constipation is influenced by internal factors (associated with increasing age) and external factors. Internal factors include delayed transit time, neurologic disorders (in myenteric plexus involve neuropeptide receptor), aging associated functional disorder like decreased tonus of rectum and anus. External factors include restricted activity, drug adverse effect, neurologic disorder, metabolic disorder, dehydration, low fiber intake, obstruction caused by tumor.⁵

Long term use of opioid drugs along with tricyclic antidepressant, anticonvulsant and psychotropic drugs often induces constipation.¹⁵ Usually it can be anticipated and avoided before worsening. However, most of the time the symptoms are not treated aggressively so it will disturb the patient. The following feature when the opioid drugs have been stopped then pain will reoccur. Constipation induced by opioid occurs through 2 (two) kinds of mechanisms. First, direct effect of opioid to slower GI tract peristaltic so that fluid absorption will increase and cause hard stool and induce fecal impaction. Second cause is the presence of abundant opioid receptor GI system which makes decreased motility and tonus while resting and induce spasm.

Constipation may be found in pregnant women, although they have no history of constipation before. Patients who had constipation and then got pregnant will have worsening symptom on constipation. The incidence was varied start from 11% to 35% in third semester pregnancy. This was believed as consequence of physiologic changes during pregnancy. Intestinal motility is decreased during pregnancy and will cause exacerbation of previously gastrointestinal tract abnormalities. Research data showed progesterone will decrease smooth muscle and contractility as well as delayed transit time.⁷

Beside hormonal factors, others that influence constipation in pregnancy are lack on fluid and fiber intake, iron supplementation, decreased physical activity, psychosocial stress, stress fro, uterine enlargement, hemorrhoid that cause pain (in some patients).

DIAGNOSIS

Careful history taking and a thorough physical examination are aimed to exclude the secondary causes of constipation since it is usually chronic symptom. Anamnesis will give valuable data on lifestyle changes related to the onset of constipation. Fecal consistency may

give clues to predict colonic transit time with assumption that liquid stool is correlated to fast transit time, while hard and solid stool is correlated with delayed transit time.

Physical examination is important to assess abnormality in rectum, start from perianal area (the presence of fissure, fistula and hemorrhoid). Next examination is perineal area at rest and supine position to determine the extent of perineal descent (normal range is 1 to 3.5 cm). Perineal descent less than 1 cm indicates failure of pelvic floor muscle to relax while defecation. On the other hand, if descent is more than 3.5 cm, it indicates the presence of perineal rigidity possibly caused by excessive straining while defecation and has been gone for long time (from childhood) resulting in incomplete fecal evacuation. Further more, excessive straining of pelvic floor will impair the nerves in sacrum area and decrease sense for complete evacuation of the rectum and finally cause fecal incontinence. Physical examination also includes digital rectal examination to search for anal stricture, rectal mass, assess tone and strength of the anal canal at rest and with squeeze, or detect the presence of fecal impaction.

Next step, supporting examinations will be performed to search for the presence of systemic disease or local abnormalities that can cause constipation. Complete laboratory examinations include peripheral blood examination, electrolyte, blood glucose, calcium level, urinalysis, and thyroid function test. Colonoscopy and barium enema will be beneficial in search for local abnormalities. They are aimed to detect the possibility of colorectal malignancy since constipation may be the early symptom of it.

In patient with symptom of refractory constipation (no secondary causes of constipation have been found) or lack of response to high fiber diet and laxative agents, it is an indication to perform physiologic test as follows:

- Colonic transit studies: aimed to assess colonic movement time. Normal time duration is 72 hours
- Anorectal manometry test, aimed to assess anal sphincter pressure (specially internal anal sphincter) in relaxation, maximal contraction of external anal sphincter, the presence of anorectal inhibitory reflex, rectal sensitivity and the ability anal sphincter to relax while straining
- Balloon expulsion test as screening test for disorders in defecatory process
- Defecography aimed to assess rectal evacuation, anorectal angle, perineal descent, structural diseases that may influence defecation such as rectocele, mucosal prolapse, or intussusceptions

TREATMENT

Treatment depends on types of constipation and any factors that may have role in inducing it. It is also necessary to educate the patients about treatment strategies and importance of fiber intake, regular defecation and avoidance of excessive use of laxative drugs for long term treatment. Treatment of constipation usually begins with high natural fiber (from fruits and vegetables) or synthetic fiber intake.² If it is considered lack of response, we may start to use laxative agents or additional prokinetic drugs such as tegaserod. Surgical intervention is rarely performed.

Patients with defecatory process disorder are usually unresponsive to laxative drugs, except if it is given in much larger dose. However, large dose of laxative agent may cause diarrhea. That is why patient needs to have biofeedback therapy.⁸ On the other hand, in patients with fecal impaction, it is very important to evacuate the impacted feces manually or with enema. Fecal impaction should be prevented by adding fiber intake and proportional use of laxative drugs to induce regular defecation.

Fiber supplementation

Fiber supplementation is the early treatment of constipation especially in cases of suspected functional constipation. Additional fiber consumption of 20-30 g/day usually will help much. The presence of fecal impaction needs to exclude first before begin fiber supplementation treatment. Fiber supplementation consists of 2 kinds of fiber:

- Natural fiber: 1 to 2 spoons of natural fiber mixed with water or food is relatively inexpensive and provides 10 - 20 g fiber per day. Disadvantage is gas formation in the gastrointestinal tract.
- Medical supplements: various synthetic fiber supplementations are available in the market recently with various kinds of taste and interesting forms such as tablets or cake. The advantage is lack of gas formation in gastrointestinal tract. Most contain 3.4 g of psyllium and 2 g of cellulose methyl form from plants and 1 g of polycarbofill (synthetic fiber).

Laxatives

- Osmotic laxatives are frequently used to soften the stool. They may be given as single treatment or in combination with fiber supplementation. They are mostly used in hospitalized elderly patients to prevent constipation and fecal impaction. These drugs are safe to be used chronically and had no addictive effect. Doses will be given may be titrated to form softened or liquid stool.

- Bulking agents consist of natural polysaccharide (psyllium) or synthetic or cellulose derivatives which have the same mechanism as the natural fiber in food. They should be given with relatively much amount of water. Thus, it should be cautiously given for patient with water restriction. Laxative containing aspartame (nutrasweet) is contraindicated in patient with phenylketonuria.
- Emollient laxatives consist of mineral oil and decussate salts. Mineral oil can be given orally or by enema; it penetrates and softens the stool. Because mineral oil may decrease the absorption of fat-soluble vitamins A, D, and K, it should be administered between meals. Aspiration with lipid pneumonia is well described; therefore, mineral oil is contraindicated in patients with esophageal dysmotility or dysphagia and in elderly or debilitated patients and should not be given at bedtime.
- Saline laxatives contain relatively no absorbable cations and anions that exert an osmotic effect to increase intraluminal water content. Magnesium may also stimulate the release of cholecystokinin to increase intestinal motor activity. Because an appreciable amount of magnesium may be absorbed, it should be avoided in patients with renal insufficiency because of the danger of magnesium toxicity.
- Stimulant laxatives consist of castor oil, anthraquinones (cascara sagrada, senna, casanthranol, and danthron), and diphenylmethanes (phenolphthalein and bisacodyl). Castor oil is hydrolyzed by intestinal lipases to ricinoleic acid, which stimulates intestinal secretion, decreases glucose absorption, and increases intestinal motility.
- Hyperosmolar agents include mixed electrolyte solutions containing polyethylene glycol and nonabsorbable sugars such as lactulose and sorbitol. Sorbitol and lactulose are degraded by colonic bacteria to low-molecular-weight acids that increase stool acidity and osmolarity. Doses should be adjusted to reduce side effects and modulate defecation. Sorbitol and glycerin are given intrarectally and may produce rectal irritation. Polyethylene glycol solutions are most often given for bowel cleansing before colonoscopy or before institution of bowel programs.

Prokinetic Drugs

Tegaserod is a new colonic prokinetic agent. This drug is a partial [5-hydroxytryptamine (5-HT)] agonists which can increased stool consistency and frequency of defecation. It is used frequently for irritable bowel

syndrome with constipation predominant. It may also be given in severe refractory constipation who unresponsive to fiber supplementation or osmoticlaxatives.

Biofeedback therapy^{2,8,9,10}

Biofeedback therapy is used to exercise the patients for pelvic floor relaxation while straining during defecation. This includes coordination with abdominal maneuver to strengthen fecal movement to the rectum. Successful rate with this therapy was reported achieving 67% and beneficial effect may last longer. However, it is useless in patients with perineal descent. Biofeedback therapy is beneficial for patients with pelvic muscle contraction disorder (dyssinergia).

Botulinum toxin type A

Injection of botulinum toxin type A into puborectal muscle was believed to be effective in treatment of constipation, especially for defecatory disorders which involve pelvic floor muscle spasm. However, it is not recommended because there has not been any controlled trial yet to prove it.

Surgical therapy

In refractory constipation, it is an indication for total colon resection and ileorectostomy if there is no defecatory disorder. This surgical intervention is performed after pharmacologic treatment considered ineffective. General complications are diarrhea and incontinence which is usually last for 1 year. Patients with underlying pshyologic disorder should not be candidate for this treatment because it will not give much improvement. Rectal surgery may be performed in patients with rectocele or female patients who always need to press their vagina to facilitate defecation.

Beside all those kinds of therapy mentioned above, recently it has been found new class of drug called chloride canal activator.¹¹ From clinical trial with 128 subjects with constipation, it revealed satisfactory result in 4 weeks. The management of constipation in elderly actually is not much different from the young adult patients. However, it should be noted the complications may become more serious in elderly patients. Complications may arise from excessive straining, fecal incontinence, fecal impaction, stercoral perforation, urinary retention, sigmoidal volvulus, rectal prolapse and all will finally cause decreased quality of life. Physiological disturbance may occur in form of depression, increased dependency and restrain from social environment. This happens because constipation is seldom complained by elderly patients and is frequently under diagnosed and under treated. One thing should be noted is that using laxative agents may not be effective

for prevention of constipation in elderly patients.⁴

Management of constipation due to opioid drugs is better beginning with bowel clean out which is aimed to prevent fecal impaction. Further management is directed to prevent constipation. It usually uses stimulant laxative and stool emollient beside fiber supplementation and increased fluid intake. These aimed to induce fecal mass formation, prevent excessive fluid absorption, and stimulate colonic contraction for defecation. It will be much better if we can reduce the dose of opioid drugs but it will not be comfortable for the patients because of the pain. In several cases, some may give cisapride to stimulate colonic contraction, especially if it was unresponsive to previous pharmacologic treatment. However, cisapride had not been used widely considering its cardiovascular effect that may arise. The use of opioid antagonist (naloxon) has also been considered to minimize the effect of opioid drugs but the efficacy is still controversial. It should be well-informed to patients not to use large amount of synthetic laxative agents because they may cause abdominal bloating and flatulence which are very uncomfortable for the patients.

COMPLICATIONS

1. Hemorrhoid

The occurrence of hemorrhoid is due to increased venous pressure in pelvic areas. Degeneration process in structural tissues in anal sphincter (due to aging process or other) causes hemorroidal protrusion and descent toward the anus. Management of hemorrhoid is varied from local pharmacologic treatment to surgical intervention depends on severity of hemorrhoid.¹²

2. Anal fissure

It is an injury in the canalis annulus and usually very painful. This caused by trauma due to hard stool passage and excessive straining during defecation resulting injury in posterior canalis annulus. This part has relatively thin layer of muscle tissues so that it is easily injured. It is already indication to perform surgery if there is anal fissure because it is predisposing factor for infection.¹²

3. Proctitis

Proctitis is inflammatory condition limited to rectal area caused by hard stool or excessive straining during defecation. Proctitis may also involve bacterial infection. To confirm diagnosis of proctitis, it should perform biopsy of the rectal tissue.¹²

4. Malignancy

Malignancy is indirect complication of constipation. Prolonged colonic transit time causes prolonged contact

of colonic mucosa with various substances in feces specially bile acid. An observational study had revealed higher level of bile in the feces in group of patients with colon cancer compare to other groups.¹³

CONCLUSION

Constipation should be managed seriously because it may decrease quality of life. Factors that may induce constipation must be identified for proper management. Self- treatment by using laxative agents should be well-controlled to prevent any unwanted side effects.

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