

Toward a definition of colonic inertia

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Abstract

Chronic constipation is a relatively frequent symptom; among its subtypes, the so called-colonic inertia represents a disease condition that is often considered for surgery. However, to date, there has been no agreement on definition of colonic inertia, and a literature review showed that this definition was given to numerous entities that differ from each other. In this paper these concepts are reviewed and a more stringent definition of colonic inertia is proposed.

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INTRODUCTION

Starting from the (interrupted) building of the Babylon Tower, human beings have been plagued by a difficulty in understanding each other, even for that concerns trivial concepts. This is especially true in the medical field, and the concept of functional gastrointestinal disorders appears to be a particularly fertile one. In fact, apparently simple complaints such as dyspepsia, diarrhea and constipation bear no single label and are still variously defined. A few years ago, a process was started that aimed at having at least a common discussion ground in defining functional gastrointestinal disorders. This process, through the work of several working teams, produced a series of documents to define the various functional gastrointestinal entities by means of the so-called Rome Criteria, now in their second version (Rome II Criteria)^[1].

Defining and diagnosing constipation

Chronic constipation is one of the most common gastrointestinal complaints^[2], and is usually defined by symptoms such as infrequent bowel movements, the presence of hard stools, an excessive time necessary to evacuate, straining, and the sense of incomplete evacuation of the bowel^[3].

The Rome II Criteria for constipation^[4] are shown in Table 1. Although these criteria represent a common ground to define constipation for research purposes, they do not take into consideration the various types of constipation, which may further be classified in to three main subgroups: normal transit constipation, disorders of defecatory or rectal evacuation (outlet obstruction), and slow transit constipation (STC)^[5].

Recent guidelines on constipation^[6] thoroughly summarize the current diagnostic approach to this symptom, obviously taking into account the fact that the suggested diagnostic tests still do not have their sensitivities established and the details

of their performances have not been well specified^[7]. Colonic transit studies with radiopaque markers are simple and reproducible tests^[8] that can be recommended for any patient undergoing evaluation for constipation. Other tests mainly focus on the anorectal and pelvic function: the balloon expulsion test (simple, inexpensive)^[9] is a useful screening one for major evacuatory dysfunctions; defecography (simple, minimal radiation exposure) can quantify defecatory function^[10]; anorectal manometry (variable methodologies, data from different centers not standardized) is useful to exclude Hirschsprung's disease and provide supportive data for a diagnosis of pelvic floor dysfunction^[11]. These tests are commonly employed in the diagnostic work-up of constipated patients, with further specific tests (rectal perception or distention or electrical stimuli, electromyography of the external sphincter or puborectalis, pudendal nerve terminal motor latency, pancolonic electromyography or manometry) usually being carried out only in clinical research or not generally applicable in common daily practice^[12].

Colonic inertia: a "smoky" entity

Among the above reported subtypes of constipation, the STC one (characterized by an abnormally delayed colonic transit time) represents approximately 15-30% of constipated patients^[13] and usually includes those with intractable constipation^[14]. The latter are usually those "refractory" to medical management, often labeled as "colonic inertia" patients, and frequently referred to the surgeon for a more drastic approach^[15]. However, it appears to be some semantic confusion concerning the term colonic inertia, which is often inappropriately used to define various types of constipation (see below).

How is colonic inertia perceived?

An internet-based search strategy of the Medline and Science Citation Index was performed using the keywords colon, colonic, inertia in various combinations with the Boolean operators AND, OR and NOT. Only articles related to human studies were used, and manual cross-referencing was also performed. Articles published in English between January 1965 and October 2003 were selected; however, a search in non-English languages and in older than 1965 journals was also performed in our library. Letters and case reports were excluded, and abstracts quoted only when the full papers were unavailable.

Table 2 summarizes the various definitions of colonic inertia found in literature, according to the method employed for diagnosis; however, although grouped together for practical purposes, it must be noted that even these subgroups have some internal differences which increase the simple definition of this entity to a number of twelve, and make difficult the interpretation of results.

According to the most frequently performed diagnostic study, radiopaque markers transit, colonic inertia patients have been classified as: (1) having a delayed transit with markers scattered throughout the viscus^[16-20], with exclusion of obstructed defecation on manometry or defecography^[21,22]; (2) synonymous of STC (without specification of markers' distribution)^[23-34]; (3) presenting markers' delay in the ascending^[35] or the right colon^[36]; (4) showing a delayed transit only in the left colon, or in both the left and right colon^[37]; or (5) displaying a delayed right and left colonic transit, but with normal transit in the sigmoid colon and rectum^[38].

Table 1 Rome II Criteria for constipation^[4]

Two or more of the following for at least 12 wk (not necessarily consecutive) in the preceding 12 mo:

- Straining during >25% of bowel movements;
- Lumpy or hard stools for >25% of bowel movements;
- Sensation of incomplete evacuation for >25% of bowel movements;
- Sensation of anorectal blockage for >25% of bowel movements;
- Manual maneuvers (digital evacuation, support of the pelvic floor) to facilitate >25% of bowel movements;
- Less than 3 bowel movements per week;

Loose stools are not present, and there are insufficient criteria for irritable bowel syndrome

Table 2 The various definitions of colonic inertia in literature*According to radiopaque transit studies:*

- Delayed colonic transit with markers distributed throughout the colon;
- Colonic inertia equates to slow transit constipation;
- Delayed transit in the right colon;
- Delayed transit in the left colon, or both in the left and right colon;
- Delayed transit in the right and left colon, with normal transit in the sigmoid and rectum

According to scintigraphic transit studies:

- Scintigraphic delay in the transverse and splenic flexure;
- Scintigraphic delay in the cecum, ascending colon, hepatic flexure, and transverse colon;
- Scintigraphic delay in the whole colon

According to manometric and/or electromyographic findings:

- Almost complete or complete absence of colonic motility

Miscellaneous:

- Decreased colonic motility;
 - Severe constipation and abdominal pain, abnormal transit study, normal anorectal manometry;
 - Refractory constipation and motility abnormalities only of the lower gastrointestinal tract
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Analysis of these reports shows that, whereas patients in group 1 could indeed somewhat represent a homogeneous group, those in groups 2-5 are highly heterogeneous, and probably include subjects with specific abnormalities (particularly outlet obstruction).

As regards colonic inertia patients defined by scintigraphic transit, they have been classified as: (1) with delay limited to the transverse colon and the splenic flexure^[39]; (2) with delay limited to the cecum, ascending colon, hepatic flexure, and transverse colon^[40]; and (3) with delay in the whole colon^[41]. Once again, it may be noted that colonic inertia is differently defined by different authors, and the patients under investigation do not represent a homogeneous entity.

Things are not better when colonic inertia patients are classified on the basis of instrumental evaluations, which include: (1) a generic "decrease" of colonic motility^[42]; (2) disturbance of colonic motility, defined by severe constipation and abdominal pain, abnormal transit study, and normal anorectal manometry^[43]; (3) refractory constipation and motility abnormalities only of the lower gastrointestinal tract^[44]; and (4) complete or almost complete absence of colonic motility, documented by manometry or electromyography^[45-48]. Again, the great variability of definitions makes likely confusion between entities, as some of the patients in groups 1-3 could easily fit criteria for the irritable bowel syndrome.

The above considerations, far from the simple semantic misunderstanding, are important in that many of the reports described in these series came from surgical groups, and were pertinent to patients in whom a surgical operation was performed, or to patients evaluated for surgery. It is therefore intuitive that such a confusion in defining an entity with potential surgical implications also generates confusion on which patients should be referred for surgery, objective evidence indicates that severely constipated patients judged to be "intractable" might actually respond to colonic pharmacologic stimulation^[49,50], suggesting that they might be responsive to more aggressive forms of medical treatment.

Toward a definition of colonic inertia

On the above grounds, colonic inertia should be better defined, and it should not be synonymous of STC or other well-categorized subtypes of constipation. The Rome Criteria have already given us a common definition of functional constipation and pelvic floor dyssynergia^[51], and STC is well recognized by the delayed colonic transit with radiopaque markers scattered within the colon, there might be the possibility of an intermediate form combining the two entities.

Colonic inertia could be characterized as a distinct form: in fact, the term *inert* literally means "(1) *inactivity* or (2) *activity or motion modest or absent*"^[52]. Under these terms, this (actually rare) form might be defined by: (1) severe functional constipation (according to Rome Criteria); (2) absence of outlet obstruction; (3) delayed transit with markers distributed throughout the colon; (4) manometric and/or electromyographic documentation of absent or almost absent colonic motor activity (including responses to meals); and (5) no response to pharmacologic stimulation (bisacodyl, others) during colonic motility recording.

It remains to be shown, however, whether this definition could predict the success of surgery more accurately, help select more accurately those patients actually needing surgery, as their colon is beyond each possible therapeutic rescue, and better understand the basic mechanisms of constipation through selection of more homogeneous cohorts of patients.

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