Abdominal symptoms and lactose: the discrepancy between patients’ claims and the results of blinded trials

Fabrizio Suarez and Michael D Levitt

The gastrointestinal tract is the only organ system in which symptoms are commonly attributed to excessive “irritability.” Irritable bowel syndrome (IBS) is said to be the second most common cause of absenteeism from work and the most common diagnosis for which patients are referred to gastroenterologists (1, 2). By definition, there is no identifiable anatomical or biochemical abnormality to explain the bloating, pain, and bowel movement abnormalities typical of IBS, and this condition is thought to result from disordered motility (3, 4). The ingestion of large lactose doses (≥ 50 g) by lactose malabsorbers similarly causes bloating, abdominal discomfort, and diarrhea (5); however, the existence of a biochemical abnormality, low concentrations of intestinal lactase, distinguishes this complex of symptoms from IBS.

Humans abhor the existence of unexplained symptoms and IBS patients have an overwhelming desire to attribute their symptoms to an identifiable etiologic factor, usually some dietary intolerance. Although most patients are confident that they can identify the foods that aggravate their problem, it is not clear that this confidence is justified. Patients tend to focus on foods that have received extensive publicity as causes of abdominal distress, eg, dairy products (lactose). In practice, IBS symptoms usually persist despite the avoidance of the putative dietary offenders, which suggests that either other foods are responsible for the symptoms or the identified foods actually played no role in the pathogenesis of the symptoms.

Intolerance to lactose is probably the most commonly implicated dietary cause of nonspecific abdominal symptoms that would, in the absence of lactose malabsorption, be attributed to IBS. The enormous publicity concerning lactose intolerance in lay publications has led to the self-diagnosis of this problem by a sizable fraction of the US population. Linkage of a dietary component to symptoms requires a temporal relation between ingestion of the food and symptoms. The widespread use of milk and milk products ensures that some lactose will usually have been ingested before a symptomatic period. “Proof” that lactose causes symptoms is provided by the apparent reduction in symptoms with institution of a lactose-restricted diet or the use of lactose digestive aids. However, the nonspecific symptoms of abdominal bloating and distention characteristic of IBS are very susceptible to the placebo effect associated with dietary manipulations or medications.

Early studies of the ability of subjects to absorb lactose used large doses (50 or 1 g/kg) ingested without other nutrients (5).

The rapid gastric emptying and small bowel transit of such lactose loads, which are greater than or equal to those in a quart (liter) of milk, clearly induced appreciable symptoms in the majority of lactose malabsorbers. Extrapolation from this observation has led to the belief that lactose, regardless of the dose, is a potential cause of abdominal symptoms in susceptible individuals. This concept was supported by early unblinded studies, which suggested that small doses of lactose, ie, the amount in a cup (≈240 mL) of milk, caused symptoms in the majority of lactose malabsorbers (6).

However, accurate assessment of the value of therapeutic manipulations for symptoms such as bloating and distention of lactose intolerance requires double-blind testing. Although it is difficult to produce a placebo that disguises the taste and texture of most dietary components, the addition of a sweetening agent to conventional milk results in a product that cannot be differentiated from that of lactose-hydrolyzed milk (7).

Well-controlled trials have shown that the vast majority of lactose malabsorbers report no significant difference in bloating, abdominal discomfort, and diarrhea with ingestion of one cup of conventional milk daily (or its lactose equivalent) compared with one cup of lactose-hydrolyzed milk (7, 8). In this issue of the American Journal of Clinical Nutrition, Vesa et al (9) provide additional evidence that moderate doses of lactose do not produce symptoms in most lactose malabsorbers. In a blinded protocol, they fed 39 lactose malabsorbers and 15 absorbers up to 7 g lactose as a single dose in milk. Neither group of subjects reported significantly greater symptoms (abdominal bloating, pain, flatulence, borborygmi, or loose stools) with lactose-containing milk than with lactose-free milk. Of considerable interest was that the lactose malabsorbers complained of more abdominal symptoms during both treatment periods than did the absorbers, a result we also observed in a recent study involving ingestion of two cups of milk daily (10). Thus, it appears that subjects who believe themselves to be intolerant to small doses of lactose may in reality have an underlying symptomatic state, IBS, for lack of a better term, which they misattribute to lactose intolerance. This is sup-

1 From the Minneapolis Veterans Affairs Medical Center.
2 Reprints not available. Address correspondence to M Levitt, Minneapolis Veterans Affairs Medical Center, 1 Veterans Drive, Minneapolis, MN 55417.
ported by the finding in several studies that a sizable fraction of patients who have diagnosed themselves as being lactose intolerant are not lactose malabsorbers (7, 8, 11).

The obvious conclusion to be drawn from double-blind studies is that one cup of milk per day does not aggravate the abdominal symptoms of most lactose malabsorbers. Thus, when milk intake is limited to a cup per day, even subjects who believe themselves to be severely lactose intolerant will not benefit from the use of lactose digestive aids.

However, the concept that modest doses of lactose can be tolerated with negligible symptoms is anathema to most individuals who perceive themselves to be lactose intolerant. Despite results of controlled studies to the contrary, these individuals adamantly maintain that small amounts of lactose cause symptoms. The conventional response to these individuals is that controlled trials do not lie and that the lactose-induced symptoms in these individuals are largely "psychologic" rather than "physiologic" in origin. However, we conclude this editorial with a heretical question. Is it possible that lactose malabsorption actually induces symptoms in these subjects, but the methodology required for a blinded study somehow alters a subject’s ability to accurately perceive symptoms? For example, does the need to focus on and grade symptoms perturb the normal, delicate mind-body interaction that results in the perception of mild abdominal symptoms, with a resulting underestimation of symptoms during the active treatment period? Heisenberg received a Nobel prize for his uncertainty principle, which stated that accurate measurements of electron speed and mass were impossible because the measurement technique necessarily perturbed the phenomenon being measured. Although unlikely to yield a second Nobel prize, it would be of interest to determine whether the blinded techniques required to evaluate lactose intolerance symptoms possibly represent a biological uncertainty principle.

REFERENCES