Lactose Intolerance: A Bad Break for the Elderly

When you ask people who consider themselves to be lactose intolerant how much milk and dairy they can consume, they invariably give you a strange look and say, "None of course…I'm lactose intolerant!" This phrase is being uttered more and more frequently in long term care homes. But according to two recent studies, up to 62 per cent of people who believe they are lactose intolerant are actually sensitive to something other than lactose.[1,2] In another study of 45 participants who claimed they were lactose intolerant and could not digest any amount of milk, 15 reported gastrointestinal (GI) symptoms after drinking both lactose-free and regular cow's milk. This suggests that, in some cases, preconceived attitudes toward milk may actually stimulate GI symptoms!

Family members, residents and even nursing staff are often quick to eliminate milk products at the first signs of GI distress without understanding the facts or considering the devastating effects that the resulting decrease in calcium and vitamin D can have on bone health in the elderly.

It is time to set the record straight on this often self-diagnosed and highly misunderstood condition.

Defining lactose intolerance

Lactose intolerance (hypolactasia) is a chronic condition caused by the inability to adequately digest lactose, a disaccharide found only in dairy products. When someone is lactose intolerant, ingestion of milk products results in GI symptoms such as diarrhea, abdominal distention, borborygmus (a rumbling stomach), foul-smelling flatus and cramping. Some studies suggest that lactose intolerance may even be responsible for some non-GI symptoms such as acne and depression.

Lactase is an enzyme that is normally produced in sufficient quantities by the brush border cells lining the small intestine. It breaks lactose down into its two component monosaccharides, galactose and glucose, for absorption in the bloodstream. If lactase is not present, lactose remains undigested in the intestine and produces an osmotic effect that draws water into the gut lumen and causes diarrhea. Intestinal bacteria are then called upon to digest the lactose, which can produce excess gas, borborygmus and cramping. Symptoms begin within 30 minutes to two hours of consumption of milk or dairy products.

However, lactose intolerance is not an all-or-nothing condition. Most individuals, irrespective of ethnicity and race, have at least some lactase-producing ability. The amount varies from person to person, meaning that everyone must assess their tolerance to lactose loads. To further complicate the issue, it is possible to have extremely low levels of lactase activity but to meet the demands of digesting a high lactose load with few symptoms if the lactose-digesting bacteria in the gut proliferate at a fast enough rate.

Types of lactose intolerance

There are three distinct types of lactose intolerance: primary lactose intolerance (PLI), secondary lactose intolerance (SLI) and congenital lactase deficiency.

Primary lactose intolerance

PLI refers to an insufficiency of lactase that causes symptoms to occur after the consumption of milk or dairy products. It is also known as 'lactose nonpersistence' or 'age-related lactase activity decline' and is the most prevalent type of lactose intolerance.

Research suggests that the gene that allows the lactase enzyme to persist has been altered over time in non-dairy consuming societies where industrialized and commercial dairy-food consumption is rare after weaning from breast milk. This may be the reason that a preponderance of non-Caucasians experience PLI. In fact, PLI occurs in more than 90 per cent of Asians and up to 80 per cent of Africans, Afro-Caribbeans and Native Canadians. Only two to 25 per cent of Caucasians worldwide are affected.

However, non-Caucasian long term care residents may not be lactose intolerant at all or may be easily able to tolerate quantities of lactose-containing foods, as recommended by Canada's Food Guide. As such, non-Caucasian status should not be viewed as a green light to eliminate milk products altogether. Race and ethnicity may serve as a preliminary reference point for lactose-intolerance screening on the admission of new residents, but long term care staff should remember that lactose intolerance is a highly individualized condition. A comprehensive assessment of past exposure and tolerance to milk is necessary on admission to ensure that all residents are receiving adequate nutrition based on their individual ability to digest lactose-containing foods without symptoms.

Secondary lactose intolerance

SLI can develop as a result of GI injury, surgery, infection, Crohn's disease, celiac

by Andrea Olynyk

Andrea Olynyk, RD, MAN is a registered dietitian and professor of nutrition at the University of Guelph and Humber College and a professor of gerontology at George Brown College. She works clinically in long term care and is frequently called upon to consult in the area of geriatric nutrition. Ms. Olynyk can be reached at (416) 824-4605 or takestalk@sympatico.ca.

Lactose Loads

(per one cup serving, except as noted)

Food	Lactose (g)
Cow's milk (whole, 2%, 1% or skim)	11
Buttermilk	10
Ice milk (1/2 cup)	9
Ice cream (1/2 cup)	6
Low-fat yogurt	5
Sour cream (1/2 cup)	4
Cottage cheese (1/2 cup)	3
Sherbet, orange (1/2 cup)	2
Swiss, blue, cheddar, parmesan cheeses (1 oz)	1
Cream cheese (1 oz)	1

Adapted from: American Dietetic Association, 2000.

disease or cancer therapy. The production of lactase may be either temporarily disrupted (e.g., in gastroenteritis) or permanently damaged. SLI typically causes the same symptoms as PLI and requires the same treatment.

Congenital lactase deficiency

Congenital lactase deficiency is an extremely rare genetic condition in which the lactase enzyme is typically absent at birth. Unlike PLI and SLI, those with congenital lactase deficiency require a lifelong lactose-free or very low lactose diet.

Lactose intolerance is not a milk allergy!

Lactose intolerance should not be confused with milk allergy, which is a far more serious condition and requires the strict exclusion of all sources of milk protein. Milk allergy is an immunoglobulin E antibody-mediated response to milk protein that can be life-threatening; lactose intolerance is not associated with immune system deficiency and is not life-threatening.

How is lactose intolerance diagnosed?

The most important step in diagnosis is to eliminate cow's milk from the diet for a period of two weeks to see if the symptoms subside. If they do, there is a good chance that the individual has a degree of lactase deficiency. The clinical test of choice for seniors is the lactose tolerance test (LTT). During the LTT, residents are provided with a dose of lactose and blood glucose levels are measured over a two-hour period following ingestion. This assesses how well the body has digested the lactose dose.

Many studies have endorsed the hydrogen breath test as a means of diagnosis because it has a higher sensitivity than the LTT. However, physicians in long term care facilities often do not have easy access to the equipment to perform this test. In addition, several medications can affect its accuracy.

Lactase: Use it or lose it

With the exception of those who have congenital lactose intolerance, the majority of people produce lactase in high enough quantities at birth to digest breast milk, which is the highest lactose-containing food. Even those who are genetically predisposed to PLI do not typically develop symptoms until the age of four or five years. This allows most people the multitude of benefits that are derived from ingesting maternal milk and proving that most of us do, indeed, start life with the ability to digest lactose.

It is common for children approaching their teen years to decrease or discontinue consumption of cow's milk, the second highest source of lactose. If they resume drinking milk as adults then they may experience GI symptoms. This does not mean they have mysteriously developed an intolerance to lactose and can no longer enjoy the health benefits of milk products; rather, their production of the lactase enzyme has probably waned due to lack of use. The good news is that most people with PLI and SLI can rebuild tolerance to lactose by slowly and steadily reintroducing it.

Building lactose tolerance

Numerous studies have shown that gradual exposure to lactose increases tolerance. The key to building tolerance in seniors is to start with one serving of a small amount of a low-lactose-containing food per day. Examples are a quarter cup of cottage cheese, a tablespoon of sour cream, half an ounce of cream cheese or half an ounce of an aged cheese such as cheddar, parmesan or Swiss cheese. Once tolerance has been built to these products, one serving of food with moderate amounts of lactose can be introduced. Examples here include a quarter cup of ice milk or ice cream, or a half cup of buttermilk. Residents can then build up to drinking small amounts of regular milk daily over three to four weeks.

Another tip for improving digestion is for residents to eat lactose-containing foods with a meal. Research shows that people with lactose intolerance can tolerate eight ounces of milk if it is taken with a meal that includes carbohydrate, fat and protein. The additional food slows the rate of digestion, giving the gut more time to manage the lactose load.

It is very important to monitor residents for symptoms of lactose intolerance while trying to reintroduce lactose to the diet. If symptoms occur, reintroduction should be slowed down. If even tiny amounts of lactose cause severe discomfort then a lactose-free diet is in order.

Implications for LTC

Seniors require 1,200 mg calcium and at least 400 IU vitamin D daily to maintain optimal bone health. If dairy products are eliminated altogether, residents miss out on these vital nutrients—as well as phosphorus, vitamin A and vitamin B2—and increase their risk of impaired bone metabolism and decreased bone mass. This can result in falls, fractures and osteoporosis. If a lactose-free diet is necessary, residents require a daily source of calcium such as sardines or salmon with bones intact, along with a good source of calcium and vitamin D as found in lactose-free milk, almond milk, soy milk and rice milk.

It is vital that health care professionals recognize the important role that milk and dairy products play in maintaining the health of residents and to make every effort to increase their often poor intake of these foods. Long term care residents should be afforded every opportunity to enjoy dairy products and reap their health benefits. Health care professionals are advised to talk to a registered dietitian, who can consult with residents and decide on an appropriate diet that may include the reintroduction of lactose-containing foods as well as dietary supplements. **LTC**

References

1. Lovelace HY, Barr SI. Diagnosis, symptoms and calcium intakes of individuals with self-reported lactose intolerance. *J Am Coll Nutr* 2005;24:51–7.
2. Swagerty DL Jr, Walling AD, Klein RM. Lactose intolerance. *Am Fam Physician* 2002;65:1845–50.

Did You Know?

- **Yogurt contains active bacteria that can help break down lactose. It is even tolerated by people who have severe lactose intolerance.**
- **Chocolate milk is better tolerated than regular milk by people with lactose intolerance.**
- **Research shows that people who have been clinically diagnosed as lactose intolerant report no problems digesting two to four servings of milk products per day.**
- **Lactose can be found in processed foods and medications.**
- **Other words for lactose on labels include milk powder, milk solids, whey and lactoserum.**

Adapted from: Dairy Farmers of Canada, 2009.