Lactose intolerance: causes, types and management

Western scientists established by the 1940s that milk was good for you. As a glass of cow’s milk was set for everyone at the table doctors were receiving discouraging reports that some of the patients were not able to digest the milk. (Dunn, R. 2011)

Lactose is a sugar found in milk and milk products. Lactose intolerance (LI) is the inability or inadequate ability to digest lactose. (Kennedy, K., 2010)

Cells of the inner lumen of the small intestines, enterocytes, are covered with a membrane that has a brush border made up of microvilli. The microvilli produce lactase, the enzyme that splits and hydrolyze dietary lactose into glucose and galactose for transport across the cell membrane. Lactase is produced in the upper, most shallow section of the villi, which is easy to damage by secondary insult. Lactase breaks down lactose into two simpler forms of sugar called glucose and galactose, which are then absorbed into the bloodstream. (Thorn, A., 2010).

If the lactase enzymes are lacking, unabsorbed sugars osmotically attract fluid into the bowel lumen. The amount of fluid influx into the bowel is about triple the normal amount, based on the osmolality of sugar alone. In addition, the unabsorbed lactose entering the colon is fermented by bacteria, producing gas and resulting in the cleavage of lactose into monosaccharides. Monosaccharides cannot be absorbed by the colonic mucosa; as a result, osmotic pressure increases, and fluid levels rise in the bowel. (Thorn, A., 2010).

The result of the rising fluid levels would be in about 30 minutes to 2 hours you might experience flatulence, stomach cramps, nausea, bloating of the

abdomen, and/or diarrhea. Symptoms may vary from person to person, and people can tolerate differing amounts of foods containing lactose. That is mainly why LI is a very misunderstood condition as there are no really positive criteria for diagnosis. (American Psychological Assoc. Lactose intolerance., 2005).

30 million US adults may be affected by lactose intolerance to some degree by age 20, older patients are predominantly susceptible. It is estimated that about 70% of the world population is affected by LI–with excessive variation among ethnicities and races. Some degree of LI is reported in up to 80% of African-Americans and Latinos, and almost 100% of Native Americans and Asian Americans. LI is least common in people of northern European descent (and is unlikely to develop before adulthood). Most mammalian babies, counting human infants, produce enough lactase to digest milk, including breast milk. This ability continues until the child is weaned. In humans, lactase activity descents at age 2 to 3 years and may cease completely by age 5 to 10. Worldwide, most humans lose 90% to 95% of birth lactase levels by early childhood, with a continuing decline during the course of a lifetime. This may help explain why many elderly people are affected by LI. (Thorn, A., 2010)

Two of the main types of lactose malabsoption are primary and secondary.

Primary lactase deficiency is the most common form. It is the normal, ongoing reduction in lactase enzyme that an ageing individual experiences, and the rate of decline is genetically determined. (Thorn, A. 2010). Researchers have identified a possible genetic link to primary lactase

deficiency. Some people inherit a gene from their parents that makes it likely they will develop primary lactase deficiency. This discovery may be useful in developing future genetic tests to identify people at risk for lactose intolerance. (Matus, J., 2003).

Secondary lactose malabsorption is normally temporary and occurs following a weakening of the mucous membrane of the small intestine (American Psychological Assoc. Lactose intolerance. 2005). The weakening can be caused by severe diarrhea, infection (eg, rotavirus), chemotherapy, or acute gastroenteritis. In these situations, lactase is the first enzyme to be harmfully affected and the last to return as the insult resolves. Secondary hypolactasia is transient and reversible. (Thorn, A., 2010). It can last from approximately one week to four weeks after recovery from a severe bout of gastrointestinal infection. (American Psychological Assoc. Lactose intolerance., 2005).

Young babies (infants) and children suffering from such an infection or from malnutrition are particularly vulnerable to this secondary deficiency of lactose enzyme. Other causes could be coeliac disease, by an allergy to cows’ milk, by certain drugs (such as antibiotics) and by gastrointestinal surgery. (Matus, J., 2003).

Infants born prematurely are more likely to have lactase deficiency because an infant’s lactase levels do not increase until the third trimester of pregnancy. (Matus, J. 2003, December). 50% of children will outgrow an allergy to milk protein by one year of age, 75% by two years and 90% by

three years. Less than 1% of children suffer from a lifelong milk allergy. (Kennedy, K., 2010)

LI is not considered life threatening, but its symptoms can severely affect a person’s quality of life and productivity. In addition to ethnicity and age, the type and amount of lactose ingested and the amount that the patient is unable to digest all affect the severity of LI symptoms. (From the pharmacy, 2008)

Not all people with lactase deficiency have digestive symptoms, but those who do may have LI. Most people with LI can tolerate some amount of lactose in their diet. LI can be difficult to diagnose by symptoms alone; physicians may need to run tests for proper diagnosis. There are two tests that doctors will usually use to measure the digestion of lactose. One is the Hydrogen Breath Test where the person drinks a lactose-loaded beverage and then the breath is examined at regular interludes to measure the amount of hydrogen. Undigested lactose produces high levels of hydrogen, normally; very little hydrogen is detectable in the breath. The second is a Stool Acidity Test. The stool acidity test is used for infants and young children to measure the amount of acid in the stool. Undigested lactose creates lactic acid and other fatty acids that can be discovered in a stool sample. Glucose may also be present in the stool as a result of undigested lactose. (NIH, 2009)

Lactose is also used in some prescription medicines, including birth control pills, and over-the-counter medicines like products to treat stomach acid and

gas. Usually only the people with severe LI will have symptoms caused by these medications. (From the pharmacy, 2008).

People who suffer from LI should be concerned with getting enough calcium and vitamin D in their diet. Calcium is needed for strong bones, to prevent osteoporosis. There are many alternative foods and lactose free milk products available today to get the proper nutrients and calcium the body needs. Because lactose intolerance is unusual in infants and children younger than 2, a health professional should take special care in determining the cause of a child’s digestive symptoms. (NIH Publication, 2009)

Although the body’s ability to produce lactase cannot be changed, the symptoms of lactose intolerance can be managed with dietary changes. Slowly introducing small amounts of milk or milk products may help some people adapt to them with fewer symptoms. Most of the time people find they can tolerate milk or milk products better by taking them with meals. (Thorn, A. 2010)

Israeli researchers did a study of 66 LI people and discovered that they got less than the 700 mg of calcium a day. That is almost half the recommended 1000 to 1200 mg for healthy bone building. When scans were done they were also found to have thinning bones and to be at risk for osteoporosis and fractures.(NIH, 2009)

People, who even after switching their diet, are still having symptoms can take over-the-counter lactase enzyme drops or tablets. Taking a few drops of the liquid enzyme may make the milk products more tolerable to consume for people with LI. (From the pharmacy, 2008)