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Lactose Intolerance

What is lactose intolerance?

Lactose intolerance is the most common cause of gastrointestinal problems and is caused by the absence of the lactase gene. As a result, the lactase enzyme is not produced and lactose is not broken down in the gut.

The symptoms of lactose intolerance are stomach cramps, nausea and diarrhea. The degree of lactose intolerance correlates well with the mal-absorption, i.e. the level of hydrogen produced in the large intestine.

Lactose is broken down into glucose and galactose, if it is not broken down however; it moves into the large intestine (colon) and the bacteria in the colon ferments the undigested lactose releasing hydrogen as a waste product. Hydrogen is absorbed into the bloodstream and expelled from the body via the lungs. When the lactase enzyme is missing, small amounts of lactose remain in the gut and draws water from the walls of the intestine causing them to become distorted and it is this that causes the discomfort people suffer.

Young people usually adapt to increased levels of milk and other dairy products if exposure is prolonged over a period of time, this is due to an increased tolerance of fermentation in the body; however, intolerance to mothers' milk is a very common condition in the newborn.

How is a hydrogen breath test performed?

- ◆ The patient is instructed to fast for 8-12 hours (usually overnight).
- ◆ A baseline breath test is performed.
- ◆ A lactose solution is given to the patient usually containing 1 g per kg of the patient's bodyweight (often terms a labeled dose)*.
- ◆ The patient is asked to repeat the breath test every 30 minutes for a four hour period.

* If we were testing for some other carbohydrate mal-absorption such as sucrose or fructose intolerance, we would simply change the test substrate. In all cases, hydrogen is still the expired gas.

What is viewed as normal hydrogen breath levels?

In individuals who have fasted, the level of hydrogen is usually below 10 ppm at the beginning of the test. If the base levels are higher, this may be due to slow digesting fibers such as beans.

What are the likely responses?

Increased levels after ingestion of lactose are as follows:

20 – 40 ppm	mild intolerance
40 – 80 ppm	moderate intolerance
above 80 ppm	severe intolerance

There are other responses and time factors within the test that can be used for other diagnosis such as bacterial overgrowth (usually an elevated level 20 – 30 minutes after ingestion and then plateaus for the rest of the test period), small bowel transit times and also diseases of the small intestine but we have concerned ourselves solely with lactose intolerance in the above response guide.

What remedies are there for lactose intolerant individuals?

If an individual is found to be lactose intolerant, they are usually given one of two options or both if too severe.

The individual is encouraged to avoid dairy products in their diet such as milk, yogurt or cheese and use an alternative such as Soy milk. There are also Lactase enzyme supplements available which will help the breakdown of lactose.

The H₂ Check Breath Hydrogen Monitor

The H₂ Check allows simple and reliable measurements of expired breath hydrogen levels. Its ease of use removes the need for specialist training and its portability means it can easily be used in different clinical settings.