

Clinical Imprints

Case study on secondary
lactose intolerance

8-month-old infant presented with AGE and secondary lactose intolerance: A case report

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Patient Profile

Date of the first visit: **02-01-2022**

Age of child: **8 months**

Gender of child: **Female**

The child first examined in: **OPD**

Mother Reported

- Recurrent stools (8-10 times/day) since past 3 days
- No visible blood in stool
- Vomiting: 2-3 times/day

AGE: Acute gastroenteritis

- Other symptoms: Mild fever, coryza, cough, and passing urine normally.
- Ingestion of lactose-containing milk aggravated loose stools.



Anthropometry (During 1st visit)

Weight (kg): **7**

Length (cm): **70**

Head Circumference (cm): **45**





Clinical Presentation

- Symptoms indicated intermittent abdominal distension, dehydration, loss of appetite, lethargy, and low energy levels.



Blood Investigations

- Hb: 10.5 g/dL, TLC: 4.500/mm³ (P47, L56, M5, E2); Na⁺: 135, K⁺: 5.5, and RBS: 110 mg/dL.



Stool Investigations

- Stool pH 4.5, reducing substance ++, RBC 2-4 per High Power Field (HPF), pus cells 0-3 per HPF, no Giardia lamblia.



Diagnosis

She was diagnosed with secondary lactose intolerance following viral AGE.



Nutritional Management

- Her formula milk was substituted with lactose and sucrose-free casein-rich infant milk 4 feeds of 240 ml each.
- Home-based complementary feeds, zinc, and ORS.
- Advised to follow-up after one week.

AGE: Acute gastroenteritis



Follow-up Visit (Post 1 week)

Anthropometry

- Weight (kg): **7.28**
- Length (cm): **70.3**
- Head Circumference (cm): **45**

Clinical Presentation

- A physical examination was performed.
- Pulse: 90 per minute, regular, of good volume.
- BP: 86/60 mmHg and capillary refill time was less than 2 seconds.
- Afebrile, alert, irritable, and thirsty.
- Mild pallor, a slightly dry mouth, and sunken eyes, but the skin pinch was going back readily.

Improvement in Stool Frequency

- 0 days: 8-10 stools/day
- 3 days: 5-6 stools/day
- 7 days: 2-3 soft & firm stools/day



Follow-up Advice

- Continue lactose and sucrose-free casein-rich infant milk formula for another 2-3 weeks.
- At the last follow-up examination at 4 weeks, she was thriving on a regular diet with normal growth.



Anthropometry (At follow-up)

Follow-up date of visit	05-02-2022
Weight (kg)	7.5
The child thrived subsequently and follow-up after 4 weeks showed that the patient weighed:	
Length (cm)	72
Head circumference (cm)	46



Discussion

- In the aforementioned case report, an infant with AGE and secondary lactose intolerance was nutritionally managed with lactose and sucrose-free casein-rich infant feed instead of regular lactose-containing feed.
- Reduction in stool frequency <1 week
- Weight gain of 500 g within four weeks
- Diarrheal episodes were reduced within one week and resolved completely within four weeks



Concluding Remarks

Acute gastroenteritis causes injury to the intestinal mucosa, which causes secondary lactase deficiency resulting in infantile diarrhea.¹

Casein

A lactose-free feed of preference for infants with diarrhea due to the following unique properties:

Higher protein quality²

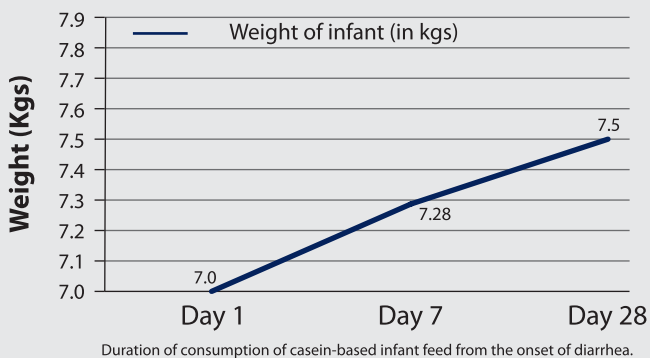
Ease in digestion³

Better nitrogen retention⁴

Palatable

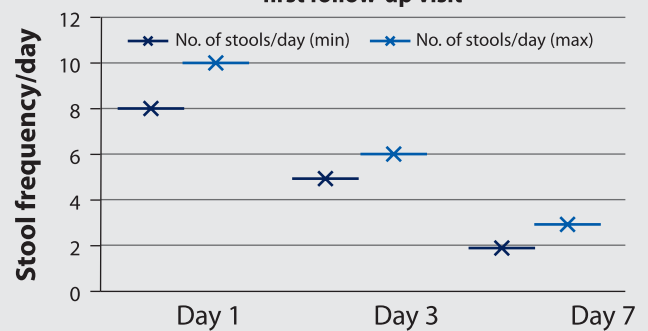
Efficient in nutrient supply⁴

Increase in weight during follow-up



Duration of consumption of casein-based infant feed from the onset of diarrhea.

Reduction in stool frequency during first follow-up visit



Significant weight gain was noted in the infant with diarrhea post introduction of a lactose-free casein-based feed, with a reduction in stool frequency from day 3.

Lactose-free casein-based feed was continued till 4 weeks to support intestinal mucosal repair.

Thus, it can be concluded that lactose and sucrose-free casein-rich infant formula is effective in the dietary management of AGE and secondary lactose intolerance.

Reduction in frequency of loose stools within 3 days

Cessation of diarrhea within 1 week

Well-tolerated among infants

Weight gain

References:

1. Malik TF, Panuganti KK. Lactose intolerance. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532285/>
2. Guillin FM, Gaudichon C, Guérin-Deremaux L, et al. Real ileal amino acid digestibility of pea protein compared to casein in healthy humans: A randomized trial. *Am J Clin Nutr*. 2022 Feb 9;115(2):353–363.
3. Nguyen TTP, Bhandari B, Cichero J, et al. Gastrointestinal digestion of dairy and soy proteins in infant formulas: An in vitro study. *Food Res Int*. 2015 Oct;76(Pt 3):348–358.
4. Hoffman JR, Falvo MJ. Protein - Which is Best? *J Sports Sci Med*. 2004 Sep 1;3(3):118–130.

The World Health Organization (WHO)* has recommended that pregnant women and new mothers be informed of the benefits and superiority of breast-feeding, in particular, the fact that it provides the best nutrition and protection from illness for babies. Mothers should be given guidance on the preparation for and maintenance of lactation, with special emphasis on the importance of the well-balanced diet both during pregnancy and after delivery. Unnecessary introduction of partial bottle feeding or other foods and drinks should be discouraged since it will have a negative effect on breast-feeding. Similarly, mothers should be warned of the difficulty of reversing a decision not to breastfeed. Before advising a mother to use an infant formula, she should be advised of the social and financial implications of her decision. For example, if a baby is exclusively bottle-fed, more than one can (500g) per week will be needed, so the family circumstances and cost should be kept in mind. Mother should be reminded that breast milk is not only the best but also the most economical food for babies. If a decision to use infant formula is taken, it is important to give instruction on correct preparation methods, emphasizing that unboiled water, unsterilized bottles or incorrect dilution can lead to illness.

*See: International Code of Marketing of Breast Milk Substitutes, adopted by the World Health Assembly in Resolution WHA 34.22, May 1981.

Importance of Breastfeeding:

Immediately after delivery, breast milk is yellowish and sticky. This milk is called colostrum, which is secreted during the first week of delivery. Colostrum is more nutritious than mature milk because it contains more protein, more anti-infective properties which are of great importance for the infant's defense against dangerous neonatal infections. It also contains higher levels of, Vitamin 'A'.

Breast milk- (A) is a complete and balanced food and provides all the nutrients needed by the infant [for the first six months of life] (B) has anti-infective properties that protect the infants from infection in the early months (C) is always available; (D) needs no utensils or water (which might, carry germs) or fuel for its preparation, breastfeeding is much cheaper than feeding infant milk substitutes as the cost of the extra food needed by the mother is negligible compared to the cost of feeding infant milk substitutes, mothers who breast-feed usually have longer periods of infertility after child birth than non-lactators; (b) details of management of breast feeding, as under:- (i) breast-feeding- (A) immediately after delivery enables the contraction of the womb and helps the mother to regain her figure quickly; (B) is successful when the infant suckles frequently and the mother wanting to breast-feed is confident in her ability to do so (ii) in order to promote and support breast-feeding the mother's natural desire to breast feed should always be encouraged by giving, where needed, practical advice and making sure that she has the support of her relatives. (iii) adequate care for the breast and nipples should be taken during pregnancy. (iv) it is also necessary to put the infant to the breast as soon as possible after delivery, (v) let the mother and the infant stay together after the delivery, the mother and her infant should be allowed to stay together (in hospital, this is called "rooming-in"); (vi) give the infant colostrum as it is rich in many nutrients and anti-infective factors protecting the infants from infections during the few days of its birth; (vii) the practice of discarding colostrum and giving sugar water, honey water, butter or other concoctions instead of colostrum should be very strongly discouraged; (viii) let the infants suckle on demand; (ix) every effort should be made to breast-feed the infants whenever they cry; (x) mother should keep her body and clothes and that of the infant always neat and clean.

Breast milk is best for babies. At Danone, we support breast feeding and believe that breast milk is the best food for babies as the sole source of nutrition for the first 6 months of life and is recommended to be continued until 2 years with the introduction of appropriate complementary foods after 6 months of age.

IMPORTANT NOTICE: Breastfeeding is the best for babies and a healthy diet / maternal nutrition is important when breastfeeding. A decision not to breastfeed can be difficult to reverse. Infant formula is suitable from birth when babies are not breastfed. It is recommended that all formula milks be used on the advice of a doctor, midwife, health visitor, public health nurse, dietitian, pharmacist, or other professional responsible for maternal and child-care and the financial implications should be considered. All preparation and feeding instructions should be followed carefully as inappropriate preparation could lead to health hazards.

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