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Original Research Article

Prevalence of Lactose Intolerance in Malnourished Children

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Abstract:

Background and Objectives: Lactose Intolerance is a condition in which a child has symptoms due to the decreased ability to digest lactose. It is due to the lack of enzyme lactase in the small intestines to break lactose down into glucose and galactose. To study incidence of lactose intolerance in malnourished children.

Materials & Methods: This study was carried out in children admitted in Paediatric wards. 214 children ranged between ages of 6 months to 5 years of both sex and varying grades of malnutrition were studied. This study was conducted at Government Medical College and Hospital, Purnea. Study duration is July 2022 to July 2023.

Results: In our study, maximum number of cases was between age group 2-3 years. In our study, out of 214 cases, 139 were found to have Lactose Malabsorption and out of 139, 65 were found between 2-3 years of age.

Keywords: Lactose Intolerance, Kadapa, Malnutrition, Lactose.

Introduction

Lactose Intolerance is a condition in which a child have symptoms due to the decreased ability to digest lactose. It is due to the lack of enzyme lactase in the small intestines to break lactose down into glucose and galactose. Symptoms may include abdominal pain, bloating, diarrhea, nausea etc., which typically start 30 minutes to 2 hours after eating or drinking milk based food. Lactose Intolerance can be primary or secondary. In Primary, Lactose enzyme is absent from the brush border of enterocyte from birth itself. They cannot tolerate any milk including breast milk. This is extremely rare. Secondary is the temporary loss of lactase as in internal infections, celiac disease, cow's milk protein intolerance etc. According to the National Family Health Survey (NFHS)4, carried out in 2015-2016, 36% of Indian children under the age of five are underweight, 38% are stunted and 21% are wasted [1].

Though there has been a slow reduction in under nutrition in our country over the years, we continue to have the highest burden of childhood under nutrition in the world. As Lactose Intolerance is of serious gravity and there is high prevalence of malnutrition in our country, it is highly essential to conduct the study of lactose intolerance in malnourished children. Jacobi postulated the association of lactose and other carbohydrates with the pathogenesis of diarrhea [2]. John Howland pointed out the relation of carbohydrates with initiation and perpetuation of diarrhea [3]. Children with severe protein-energy malnutrition commonly have a reduced activity of intestinal lactase, the enzyme responsible for the digestion of lactose [4,5], and it has been suggested that feeding this disaccharide can retard nutritional recovery [6]. Secondary lactase deficiency can present at any age but is more common in infancy [7,8]. This contrasts with the risks in normal children as demonstrated by Gabr and colleagues in Egypt: 12% in the age group 6 months to 2 years, 32% in the age group 2-5 years, 32% in the age group 5-9 years, and 80% in the age group 9-12 years [9].

Materials and Methods

This study was carried out in children admitted in paediatric wards. 214 children ranged between ages of 6 months to 5 years of both sex and varying grades of malnutrition were studied. This study was conducted at Government Medical College and Hospital Purnea, Bihar. The study was carried out for a period of 1 year, with informed consent. All children were grouped into 4 grades of malnutrition according to Indian Academy of Paediatrics (IAP) recommendation (OP Ghai).

In all the children Anthropometric measurements like weight, length / height, mid-arm circumference were taken. A detailed History of present illness, relevant past history, an accurate dietary history and thorough general and systematic examination, stool examination etc., were done. Stool pH was determined by Nitrazine Paper range 5 to 7.5. Lactose tolerance test was done in all the cases by loading 2 gm per kg body weight, which is supplied by the

National Institute of Nutrition, in the form of 10 percent lactose solution after 4 hours fast. Blood glucose estimation was done at 0, 30, 60 minutes after oral lactose load. All these patients were observed for a period of 8 hours for any side effects of lactose oral load and stool samples before and after the lactose oral load were collected for pH determination. Blood glucose estimation was done by Eyetone reflectance calorimeter. After lactose tolerance test and barium meal examination, parents were instructed to exclude milk from the diet of the children.

Results

Table 1: Distribution of various grades of Malnutrition according to age

Grades of Malnutrition	Age Group			
	6 Months – 1 Year	1 – 2 Years	2 – 3 Years	3 – 5 Years
I	5	10	15	8
II	4	8	19	10
III	11	16	46	23
IV	5	9	14	11
Total	25	43	94	52

Maximum numbers of cases studied were between age group 2 to 3 years i.e., 94 cases out of 214 cases.

Table 2: Age distribution of Lactose Mal absorbers

Grades of Malnutrition	Age Group			
	6 Months – 1 Year	1 – 2 Years	2 – 3 Years	3 – 5 Years
I	0	1	1	2
II	3	4	11	6
III	4	6	14	9
IV	9	11	39	19
Total	**16**	**22**	**65**	**36**

Out of 214 cases, 139 cases were found to have Lactose Mal absorption. Out of 139 Lactose Mal absorbers, 65 were found between 2-3 years of age.

Table 3: Stool pH Range in Lactose Mal absorbers

Stool pH Range	Number of Cases
5 – 6	125
6 – 7	14

Stool pH range was between 5 to 6 in 125 cases and 6 to 7 in 14 cases out of the total 139 Lactose Malabsorbers.

Discussion

The earliest literature on Lactose as constituent of milk was known 345 years ago [10]. The concentration of Lactose in milk varies from species to species. The milk of Californian Sea Lion contains no Lactose and that of rabbit contains only 2 gms [11]. In this study, children of varying grades of malnutrition between 6 months to 5 years of age were included for the evidence of Lactose Malabsorption by detecting stool pH and Lactose Tolerance test by estimating blood glucose levels after oral lactose load and then by doing a barium meal radiograph for the evidence of malabsorption syndrome.

In our study, maximum numbers of cases were between age group 2-3 years. In our study, out of214 cases, 139 were found to have Lactose Malabsorption and out of 139, 65 were found b etween 2-3 years of age. Stool pH range was between 5-6 in 125 cases and 6-7 in 14 cases out of the total 139 Lactose Malabsorbers in our study. In our present study, the incidence of Lactose Malabsorption is 64.9 percent i.e., 139 Malabsorbers out of 214 cases studied and this observation is in accordance with Desai [6]. A study done by Richard et al reported that, most children (68%) with lactose intolerance were infants 3-12 months, [12] a finding consistent with several other studies [8,13]. Debke who showed 18.7 percent incidence, because of age difference and children who were not malnourished were also included in his study [14]. Lactose malabsorption is common in protein energy malnutrition. This can be determined by simple ward tests and abnormal lactose tolerance curve after oral lactose load. Lactose malabsorption increases with the severity of malnutrition. In majority of the patients, stool pH was between 5 to 6. Lactose tolerance test was done by giving 10 percent solution of 2 gms per kg of body weight of oral lactose. Any cases whose pH was less than 6, is screened for lactose malabsorption. There is no correlation of radiological evidence of malabsorption syndrome between lactose malabsorbers and absorbers. Malnutrition leads to lactose malabsorption and lactose malabsorption is an important contributory factor in production of

malnutrition. actose intolerance has been recognized for many years as a common problem in many children and most adults throughout the world. Although rarely life-threatening, the symptoms of lactose intolerance can lead to significant discomfort, disrupted quality of life, and loss of school attendance, leisure and sports activities, and work time, all at a cost to individuals, families, and society.

Conclusion

Use of lactose-free diets such as yoghurt should be considered for children found to have evidence of lactose intolerance and whose response on standard therapeutic milk formula is poor.

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