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Role of Lactose free milk in Acute Diarrhea

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Abstract

Acute diarrhea is a very common disease in developing countries and is the first cause of death in children under two years old. diarrhea associated lactose intolerance is a clinical syndrome of abdominal pain, diarrhea nausea, flatulence, bloating after ingestion of lactose containing foods that cause symptoms vary according to the amount of lactose consumed. 170 hospitalized patients admitted at Tikrit Teaching Hospital were divided into three groups 70 on lactose free milk, 50 on cow milk and 50 on breast milk to see the effects of lactose free formula on bowel motions, hydration state, stool consistency, and duration of hospitalization. The study showed that (77.14%) of those on LFF having four motions on 2nd day which indicating a significant decrease in bowel motions. Also the results revealed that (45.71%) of those on LFF were discharged after two days of hospitalization. The effects of LFF on state of hydration revealed that (67.14%) improved in the hydration status on the 2nd day of hospitalization. Results were concluded that LFF having a beneficial effect on acute diarrhea in children under two years.

دور الحليب الخالي من اللاكتوز في الاسهال الحاد

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الملخص

الإسهال الحاد من الأمراض الشائعة في الأطفال في الأقطار النامية وه و السبب الأول في وفيات الأطفال . الاسهال المسبب بحساسية في اللاكتوز مصاحب بأنتفاخ البطن ، اسهال والم في البطن بعد تناول مواد غذائية حاوية على اللاكتوز. تمت الدراسة على 170 مريض راقد في مستشفى تكريت التعليمي وقسمت الى 3 مجاميع . سبعين مريض على غذاء خالي من اللاكتوز و50 مريض على حليب الأبقار و50 مريض يتناولون الرضاعة الطبيعية . نتائج البحث اظهرت 45,7% من مجموعة الذين يتناولون غذاء خالي من اللاكتوز تم شفائهم بالكامل . وأظهرت الدراسة بأن الأطفال المرضى الذين تناولوا غذاء خالي من اللاكتوز تماثلو للشفاء بنسبة 67,1% من علامات الاسهال الحاد.

Introduction

Worldwide, diarrheal diseases are responsible for a significant proportion of morbidity in children under two years of age and remain as a leading cause of childhood death [(1)]. The impact of diarrheal diseases is more severe in the earliest periods of life, taking into account both the number of episodes per year and the hospital admission rates [(2)]. These are serious issues globally because they affect hundreds of millions of young children and annually cause more than three million deaths in children [(3)]. Any attempt to assess the severity of diarrhea in children should include attention to its acute and long-term effects [(4)]. Earlier reports have shown a mortality rate of (45%-70%); this reflects the difficulties in management and the non-responsiveness to dietary treatment especially in patients in whom a specific diagnosis cannot be established. The improved management and earlier intervention have improved outcome, and mortality rate is reduced to 5%[(5)]. Lactose (disaccharide that comprises the monosaccharaides glucose and galactose) is the primary carbohydrate found exclusively in mammalian milk[(6)]. It is the primary sugar of dairy products such as cheese and yogurt. It is also the sugar that found in breast milk and standard infant formulas. Therefore almost all babies are able to digest and absorb this sugar and it serves as their primary dietary sugar [(7)]. Lactose malabsorption occurs when lactase (the enzyme required to hydrolyze lactose which found primarily in tips of the villi in the jejunum) is deficient and then lactose is not completely digested and absorbed in the small bowel [(8)]. Lactose intolerance can occur among infants and young children with acute diarrheal disease, although the clinical significance of this is limited except in more severely affected children. Symptoms of lactose intolerance are relatively common among older children and adolescents; however, associated intestinal injury is infrequently seen[(9,10)]. The symptoms of lactose intolerance may include bloating, diarrhea, flatulence, abdominal pain, distention and cramping [(11)]. This study aimed at evaluating the role of the lactose free formulas in the treatment of patients with acute diarrhea.

Patients and Methods

A cross section interventional study carried out on 170 children under two years whose admitted to the pediatric ward in Tikrit Teaching Hospital with acute diarrhea from 21th January to the 30th September 2009. The data of the study was collected that include: socio-demograghic characteristics of children which include(age ,sex,residence), type of feeding, No.of bowel motion,date of admission, state of dehydration according to clinical bases,and days of hospitalization. Children who are included in the study: healthy before the attack of acute diarrhea and not suffering from a chronic illness or severely malnourished child. The sample was divided into three groups: 1st group which consist of (70) children on Lactose free formula, 2nd group which consist (50) children on cow milk formula and 3rd group which consist (50) children on breast milk. Statistical analysis was done by using SPSS 13 pack for windows and Chi-square test(X2 –test) used for comparing groups. The level of signification was (0.05) for comparison, descriptive, and analytic statistics were carried out.

Results

The results of this study showed that from (170) children aged under two years who were involved in this research, there are 93 male and 77 female in a percent of (54.7%) and (45.29%) respectively. Analysis of the residency revealed that 95(55.88%) of children are from rural area and 75(44.11%) from urban area. The frequencies of bowel motion according to the feeding types in the first post admission day are: 4 to 5 bowel motion in 54 (77.14%) of those feed on lactose free formula, 8 (16%) in those on

cow milk formula and 6 (12%) in children on breast feeding. More than 10 bowel motions were found in 2 (4%) children on cow milk. Table (1). The study results show that from (70) children on lactose free there are 47 (67.14%) their hydration state is improved while 23 (32.85%) not improved, and from (50) children on cow milk there are 9 (18%) are improving and the rest are not. While from (50) children on breast feeding there are 12 (24%) their hydration status are improved and the rest not improved. Table (2). Concerning the effects of feeding types on the duration of hospitalization, the results showed that from (70) children on lactose free formula there are 32(45.71%) discharged after 2 days,(12) children (17.14%) discharged after 3 days and (4) children (5.71%) discharged after 4 days while the other discharged after 5 days. From (50) children on cow milk there are 1(2%) discharged after 2 days, 4(8%) discharged after 3 days, 5(10%) discharged after 4 days and the other discharged after 5 days. From (50) children on breast feed 3(6%) of them discharged after 2 days, 8(16%) discharged after 3 days, 4(8%) discharged after 4 days and the others discharged after 5 days, Table (3). The present study also revealed the effects of feeding type on the stool consistency. From (70) children on lactose free there are (11.42%) children having liquid stool, and (70%) having soft stool. From (50) children on cow milk there is(66%) liquid stool ,(20%) semiliquid and (14%) soft stool. From a (50) children on breast feeding there is a (38%) liquid, (40%) semiliquid and (22%) soft stool. Figure(1)

Table(1):-The frequency distribution of types of feeding on number of bowel motions . P-value= Significant

Types of feeding / No. of bowel motion	Lactose-free formula		Cow-milk formula		Breast feed		Total
	No.	%	No.	%	No.	%	
4-5	54	77.14	8	16	6	12	68
6-7	11	15.71	7	14	29	58	47
8-9	5	7.14	33	66	15	30	53
≥10	0	0	2	4	0	0	2
Total	70		50		50		170

Table(2):- The frequency distribution of the hydration state according to the feeding types. P-value= Significant

Type of feeding / **Hydration status**	Lactose free formula		Cow milk formula		Breast feed		Total
	No.	%	No.	%	No.	%	
Improved	47	67.14	9	18	12	24	68
Not improved	23	32.85	41	82	38	76	102
Total	70		50		50		170

Table(3):- The effect of feeding types on days of hospitalization. P-value=significant

Types of feeding / **Days of hospitalization**	**Lactose free formula**		**Cow milk formula**		**Breast feed**		**Total**
	No.	**%**	**No.**	**%**	**No.**	**%**	
2	**32**	**45.71**	**1**	**2**	**3**	**6**	**36**
3	**12**	**17.14**	**4**	**8**	**8**	**16**	**24**
4	**4**	**5.71**	**5**	**10**	**4**	**8**	**13**
5	**12**	**17.14**	**12**	**24**	**11**	**22**	**35**
6	**9**	**12.85**	**18**	**36**	**16**	**32**	**43**
≥7	**1**	**1.42**	**10**	**20**	**8**	**16**	**19**
Total	**70**		**50**		**50**		**170**

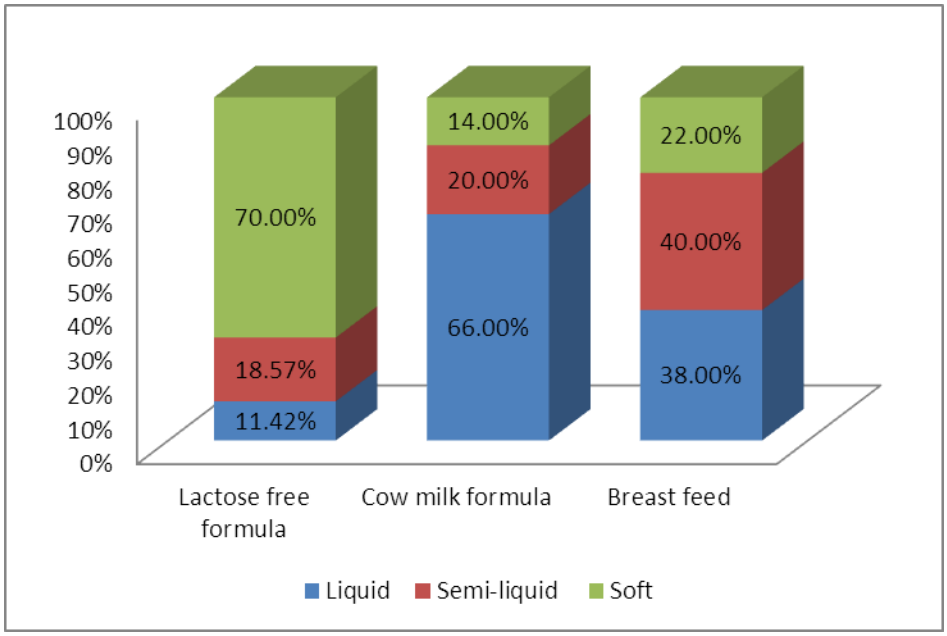

Fig.(1):-The stool consistency according to the feeding type

Discussion

In this study there were (77.14%) of children on lactose free formula have 4-5 bowel motion in first post admission day, while there is only (16%) of patient on cow milk formula and (12%) patient on breast feeding have decreased in bowel motion which indicate decrease in frequency of bowel motion in the group of children on lactose free formula. These results are consistent with the study done by Santosham et al who show a significant decrease in the frequency of bowel motions on lactose free formula [(12)]. The present study showed that (67.14%) of 70 children on LFF having an improvement in hydration state while from 50 child on cow milk there is (18%) improved hydration state, and from50 child on breast feed there is (24%) improved hydration state .The same results were found by Kenneth H. Brown researchers who studied the optimal approach of initial dietary management of children with acute diarrhea and dehydration [(13)]. Peter B. Sullivan by his study show the use LFF have been shown to have important beneficial effect to decrease purging rate [(14)]. The study showed that (45.71%) of patients on LFF were discharged on the second post-admission day, while only (2%) of those on cow milk, and (6%) on breast feeding were discharged during that period. One summary of the research BMJ Group, looked at 13 studies, found that diarrhea or dehydration was more likely to get worse in babies who had normal formula milk (about 2 in 10 babies) compared to those who had lactose-free formula milk (about 1 in 10 babies). Babies on lactose-free milk got better faster (after about three-and-a-half days) compared to those on normal formula milk (about five days) [(15)]. The present study revealed that 70% of patients fed on LFF having soft stool consistency and a small percentage passing liquid and semi-liquid stools. On the other hand, there were 14% of children on cow milk and 22% of those on breast feeding having soft stool consistency. These results found by Brown et al. They showed a significant reduction in the duration of liquid stool excretion in infants fed the LFF. Also Kenneth H. Brown in his study show that

use of LFF in acute diarrhea specially for severely dehydrated child show decrease the frequency of liquid stool excretion [16].

Conclusions

1-Significant relation was found between the use of LFF and the number of bowel motion, (77%) show decrease in bowel motion.
2-Significant relation between the use of LFF and the stool consistency, (70%) show soft stool consistency.
3-Significant relation between the use of LFF and hydration status, (67%) improved in hydration status.
4-Significant relation between the use of LFF and the duration of hospitalization, (62.85%) discharge by (2-3) days.

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