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Refeeding with Free Lactose Milk (Al - 110 Nestle) in Children Suffering from Gastroenteritis and Dehydration

by

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Abstract

Forty one infants suffering from diarrhoea hospitalized in the Department of Child Health, Medical School, University of Indonesia/Dr. Tjipto Mangunkusumo General Hospital, Jakarta, from August 15, 1973 to January 15, 1974 were refeed with "free lactose milk".

The result is as follows :

1. From the point of view of increase of body weight :

27 (65.8 %) out of 41 cases were excellent.

2 (4.9 %) out of 41 cases were good.

12 (29.3 %) out of 41 cases were poor.

2. From the point of view of stopping the diarrhoea :

25 (60.9 %) out of 41 cases were excellent.

10 (24.5 %) out of 41 was good.

6 (14.6 %) out of 41 cases were poor.

Small bowell biopsy from children with gastroenteritis often demonstrates histologically the presence of villous atrophy (Walker Smith, 1969, 1972) which may lead to secondary sugar intolerance (Dahlqvist et al., 1970; Sunoto et al., 1973).

Antibiotic treatment and refeeding with normal milk formula consisting of high content of lactose often give unsatisfactory results.

In treating Protein Calorie Malnutrition and/or gastroenteritis in children, a lactose free or low lactose diet might be more reasonable (Suharjono et al., 1971). The purpose of this study is to know the effect of free lactose milk formula on refeeding in children suffering from gastroenteritis.

Materials and methods

Forty one children suffering from gastroenteritis and dehydration hospitalized in the Department of Child Health Dr. Cipto Mangunkusumo General Hospital, Jakarta, belonged to this study.

On refeeding after termination of the intravenous fluid therapy, Al-110 (NESTLE) milk formula was orally applied which was free of lactose. The main composition of this formula in 100 grams of powder is as follows:

protein	22 gm
fat	21 gm
glucose	50.8 gm
salt	3.3 gm

water	2.9 gm
calories	480 or 670 cal/L.

Starting the realimentation and adaptation we used dilution of 1/3 this formula which was increased daily until it reached the proper dilution adapted to the requirement of the child.

After 3 consecutive days the proper dilution of Al-110, S.G.M. (a local milk formula product) was substituted 2 times daily, Al-110 remained 4 times a day; the following day, further on S.G.M. 4 times and Al-110 2 times and usually on the third day mainly S.G.M. formula was given.

The composition of SGM in 100 grams of powder is as follows:

protein	20 gm
fat	11 gm
glucose	28 gm
other carbohydrates	22 gm
salt	5 gm
water	3 gm
calories	428 or 514 cal/L.

The antibiotic used routinely was Neomycine 50 mg/kg body weight for 5 consecutive days if leucocytes 2+ (10 — 20 leucocytes per high power field) were found on microscopic examination of the stools.

Follow up study concerning frequency of stools and increase of body weight was carried out for a period of 2 to 3 weeks of hospitalization.

Criteria of the results used are as follows:

Increase of body weight is considered excellent if the ratio between monthly increase of body weight on the Al-110 and the normal standard

monthly increase according to age is more than 1. The increase is considered good if the ratio is approximately 1, and poor if the ratio is less than 1. In evaluating the frequency of the stools the result was regarded as excellent if the stool become already pasty on the second to third day of the formula and diarrhoea did not recur on the introduction of SGM. The result was good if stool become already pasty on the third to fifth day and did not recur or only slightly loose stools appeared on the introduction of the SGM. If diarrhoea was still present after fifth day the result was considered poor.

Result

The result of the trials base on criteria mentioned before can be seen in Table 1. From the results it is revealed that the stopping of diarrhoea was: excellent 25 (60.9%), good 10 (24.5%) and poor 6 (14.6%) out of 41 (100%) cases.

The increasing of body weight was: excellent 27 (65.8%), good 2 (4.9%) and poor 12 (29.3%) out of 41 (100%) cases.

Discussion

Disaccharidases are found within the brushborder lining the luminal surface of the intestinal epithelium (Miller and Crane, 1961) and therefore are able to be affected in any disorder in which the intestinal mucosa is damaged. Damage of the in-

testinal mucosa could result in secondary disaccharide intolerance (Dahlqvist et al., 1970; Sunoto et al., 1973); however this abnormality could be reversible due to the reversibility of the damage of the mucosa in children suffering from gastroenteritis (Walker Smith, 1972, 1973). Normally lactose is present in lower concentration as compared with other brushborder disaccharidases (Dahlqvist et al., 1964) and is also the last to recover completely following damage (Plotkin and Isselbacher, 1964).

Consequently, lactase deficiency is the most important type of secondary disaccharidase deficiency and therefore free lactose or low lactose milk formula should be preferably introduced as primary refeeding in diarrhoeal children. From the present study good to excellent result in refeeding diarrhoeal children with free lactose milk formula are obviously obtained. Only 12 out of 41 showed poor result in increasing body weight, 3 suffered from PCM, 1 from Down's syndrome and congenital heart disease and 1 from tuberculous meningitis. These accompanying disease might be play a role too in the cause of the poor results.

Twenty seven other patients with excellent results showed increase of body weight of 300 to 750 gm a week.

Comparing with the result of previous trial on refeeding with low lactose milk (LLM) produced by a local factory, the difference was statistically

TABLE 1 : *Effect of free lactose milk (AI-110 Nestle) on refeeding children suffering from gastro-enteritis and dehydration.*

No.	Patient	Age (mo)	Body weight (B.W.) on admission (gm)	Duration of hospitalization (days)	Increase of B.W. during hospitalization (gm)	Period after which diarrhoea stops (days)	Accompanying disease	Results		
								E	G	P
1.	D	5½	4300	10	—	2	Tuberculous meningitis PCM, Br. Pnia	D	—	Gr
2.	A	11	4600	7	550	2	Br. Pnia	D,Gr	—	—
3.	M	10	6300	7	—	1	—	D,Gr	—	—
4.	M	9½	7050	8	50	1	Br. Pnia Convulsions	D	—	Gr
5.	L	4	4100	8	350	1	—	D,Gr	—	—
6.	H	9	6900	7	450	1	—	D,Gr	—	—
7.	K	5	5300	8	500	1	—	D,Gr	—	—
8.	A	4	3300	8	380	1	PCM	D,Gr	—	—
9.	D	8	4800	8	200	5	PCM, Br. Pnia	—	Gr	D
10.	M	6	4450	7	—	6	PCM	—	—	D,Gr
11.	H	4	4750	8	350	1	Convulsion,	D,Gr	—	—
12.	J	7	6150	8	—	4	—	—	D	Gr
13.	M	8	4700	13	650	3	—	D,Gr	—	—
14.	N	8	6350	9	300	2	Br. Pnia Encephalitis	D,Gr	—	—
15.	F	1½	3100	4	—	4	—	—	—	D,Gr
16.	M	9	6000	8	700	2	—	D,Gr	—	—

D = Diarrhoea (Stoppings)
Gr = Growth

P = Poor
G = Good
E = Excellent

TABLE 1 (continued).

No.	Patient	Age (mo)	Body weight (B.W.) on admission (gm)	Duration of hospitalization (days)	Increase of B.W. during hospitalization (gm)	Period after which diarrhoea stops (days)	Accompanying disease	Results		
								E	G	P
17.	H	5½	5800	12	—	6	—	—	D,Gr	
18.	S	9	8200	7	500	3	—	D,Gr	—	
19.	H	7	7100	7	—	1	—	D	Gr	
20.	E	3	4200	7	400	1	Sepsis	—	—	
							Convulsions	D,Gr	—	
21.	L	1	2100	12	400	1	Sepsis	D,Gr	—	
22.	N	2	2700	14	—	9	—	—	D,Gr	
23.	M	6	4750	8	350	1	PCM	D,Gr	—	
24.	E	24	6750	7	200	7	PCM	—	D,Gr	
25.	S	5	3550	5	—	2	Down's syndrome, VSD	—	D	
							—	Gr	D	
26.	A	4	4000	7	300	4	—	Gr	D	
27.	S	2½	3600	8	350	1	Br. Pnia	D,Gr	—	
28.	T	5	4500	8	400	1	—	D,Gr	—	
29.	M	1	2700	8	350	1	—	D,Gr	—	
30.	M	7	6200	7	1050	2	OMA	D,Gr	—	
31.	H	6½	5400	7	350	3	Pharyngitis	Gr	D	
32.	D	7½	6800	7	450	1	Pharyngitis	D,Gr	—	
33.	D	11	7500	7	500	1	Pharyngitis	D,Gr	—	
34.	A	18	3500	7	850	1	PCM, OMA	D,Gr	—	
35.	S	2½	2400	10	—	4	—	—	D	
								—	Gr	

D = Diarrhoea (Stoppings)
Gr = Growth

P = Poor
G = Good
E = Excellent

TABLE 1 (continued).

No.	Patient	Age (mo)	Body weight (E.W.) on admission (gm)	Duration of hospita- lization (days)	Increase of B.W. during hospitali- zation (gm)	Period after which diarrhoea stops (days)	Accompanying disease	Results		
								E	G	P
36.	L	2	3100	5	—	4	OMA	—	D	Gr
37.	F	8	6800	7	300	3	OMA, Candi- diasis	Gr	D	—
38.	H	8	8500	8	1350	3	Convulsions OMA	Gr	D	—
39.	E	7	6600	6	50	1	OMA	D	—	Gr
40.	Y	4	5500	7	300	3	Br. Pnia	Gr	D	—
41.	T	2½	4360	7	420	3	OMA	Gr	D	—

D = Diarrhoea (Stopping)
Gr = Growth

E = Excellent
G = Good
P = Poor

not significant. On LLM, 7 (77%) out of 9 patients showed good to excellent results in stopping the diarrhoea but only 4 (44%) showed excellent results in increasing body weight, as judged by the same criteria (Sutedjo et al., 1974).

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