ORIGINAL ARTICLE

Nutritional Status of the Underfive Children at The Pediatric Ward of Dr. Pirngadi Hospital, Medan

by

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Abstract

An observational study on the assesment of nutritional status of the underfive children at the pediatric ward of Dr. Pirngadi hospital, Medan was conducted during February to March 1990.

Nutritional status was determined using the parameters of Weight/Age (W/A), Weight/Height (W/H) and Mid Upper Arm Circumference (MUAC) in accordance with the Seminar on Nutritional Anthropometry 1975.

One-hundred and eighty patients were included in this study, consisting of 115 (67,6%) children less than one year and 65 (32,4%) children 1 - 5 years.

According to the Weight/Age parameter there were 46.7% wellnourished children 42.8% with moderate and 10.5% with severe malnutrition on admission, while on discharge they were 48.3% , 42.8% and 8.9% (p > 0.05) respectively.

Weight/Height and Mid Upper Arm Circumference parameters also failed to reveal significant differences.

The duration of hospitalization ranged from 1 to 30 days (mean 5 days). The most predominant disease was gastroenteritis with dehydration (68.9%).

In 54.4% of patients, breast-feeding had been given until 6 month of age, while supplementary food starting before the age of 2 months was found in 52.2% .

The incidence of undernutrition in underfive children was high

Introduction

Malnutrition remains a public health problem of developing countries including Indonesia. Malnutrition is not only caused by insufficient calorie intake, but is also closely related to some infections [1,2].

The lack of food intake will affect growth and the effect will depend on the severity and duration of malnutrition. Clinical manifestation varies from mild to severe type [3,4].

In addition, hospitalized patients may even have malnutrition, either caused by the disease or by lack of food intake.

The purpose of this study was to assess the nutritional status of the underfive children admitted to the pediatric ward of Dr. Pirngadi Hospital Medan and to compare the nutritional status of the patients on admission and on disharge.

Materials and methods

This cross sectional study was conducted from February to March 1990. All babies and children of up to 5 years old were included in this study. Newborn infants at the neonatal ward were exluded. The data were obtained trough :

Interviewing the parents, concerning :

. Identity of children : name, sex, birth weight, birth length

. Identity of the parents : name, age, education, profession, income

. Immunization status

. Feeding pattern

Physical examination

Anthropometric measurement :

. Body weight was measured by Tanita Scales made in Japan for babies and Detecto Scales for children, with the sensitivity of 0.1 kg.

It was measured at the first day and repeated every day on the same time until the patients discharge. In cases suffering from gastroenteritis with dehydration the nutritional status was determined after rehydration.

The height was measured with a wood ruler (using the sensitivity of 0.1 cm) for children under 2 years and a special device was used for children who had been able to stand up. Measurements were done at the first day of admission.

The age of the children was obtained from the birth certificate and the information from the parents / family.

. Mid Upper Arm Circumference (MUAC) was measured by plastic tape for children older than 1 year taken on admission.

Nutritional status was assessed using parameters of Weight / Age, Weight / Height and MUAC. Classification used is from the Seminar on Anthropometry 1975. The socio-economic status was determined by using modified Bistok Saing's formula (1977) [5] :

Indicator : Scores	1	2	3
Income : less than	Rp.50.000,-	Rp.50.000-100.000,- more than	Rp.100.000,-
Education			
Mother :	Elementary School	Junior-senior High School	Academy-University
Father :	Elementary School	Junior-senior High School	Academy University
Number of children :	6	4 - 6	1 - 3
Socio-economic levels :	Low : scores 4 - 6		
	Middle : scores 7 - 9		
	High : scores 10 - 12		
Chi square test was used in analyzing the association of qualitative data.			

Results

Two-hundred and ninety nine patients were hospitalized at pediatric ward of Dr. Pirngadi Hospital Medan during February to March 1990. From those patients, 188 (63.2%) were underfive children. Eight patients died during this study, 180 were analyzed further.

Out of 180 underfive children there were 109 (60.5%) males and 71 (39.5%) females (Table 1).

According to Weight/Age (W/A) there were 46.7% wellnourished children. On discharge there was a litle improvement of their nutritional status (p > 0.05) (Table 2).

Table 1. *Distribution of cases by age group and sex*

Age	Male		Female			
(Years)	Number	%	Number	%	Total	%
<1	67	61.5	4	67.6	115	63.9
1 - 5	42	38.5	23	32.4	65	36.1
Total	109	60.5	71	39.5	180	100.0

Table 2. *Nutritional status by W/A on admission and on discharge*

Time	Number of children	Nutritional status					
		Wellnourished		Moderate malnutrition		Severe malnutrition	
		Number	%	Number	%	Number	%
On admission	180	84	46.7	77	42.8	19	10.5
On admission	180	87	48.3	77	42.8	16	8.9
Total	360	171	47.5	154	42.8	35	9.7

p>0.05

Table 3. *Nutritional status by W/H on admission and discharge*

Time	Number of children	Nutritional status					
		Wellnourished		Moderate malnutrition		Severe malnutrition	
		Number	%	Number	%	Number	%
On admission	180	60	33.3	61	33.9	59	32.8
On admission	180	60	33.3	66	36.7	54	30.0

p>0.05

Based on the age group, the wellnourished children were found predominantly in the age of under one year (55.7%) where as moderate malnutrition was 33.9% and severe malnutrition was 10.4% .

In the age group of 1 - 5 years, the most was moderate malnutrition 58.5% , wellnourished 30.7% and severemalnutrition 10.8% .

Using Weight/Height (W/H) parameter, there were less (33.3%) wellnourished children on admission (Table 3). On discharge, improvement occurred in severe malnutrition cases to become moderate malnutrition eventhough the difference was not statistically significant.

Based on W/H in children under 1 year, the nutritional status was wellnourished, moderate and severe malnutrition in 37.3% , 33.9% and 28.7% , respectively. In children of 1 - 5 years, severe malnutrition was predominant (40.0%), followed by moderate (33.8%) and wellnourished (26.2%)

Based on MUAC, in children 1 - 5 years, moderate malnutrition was found in 31 (47.7%), followed by wellnourished in 22 (33.8%) and severe malnutrition in 12 (18.5%) (Table 4).

Most of the children were breast-fed up to 6 months (54.4%). Six (4.2%) infants were not breast-fed at all. The relationship of breastfeeding and nutritional status is shown in Table 5.

Table 4. *Nutritional status based on Mid Upper Arm Circumference*

Age group (Years)	Number of children	Nutritional status					
		Wellnourished		Moderate malnutrition		Severe malnutrition	
		Number	%	Number	%	Number	%
1 - 2	39	9	23.1	21	53.8	9	23.1
- 3	11	5	45.4	5	45.4	1	9.1
- 4	7	3	42.8	3	42.8	1	14.3
- 5	8	5	62.5	2	25.0		12.5

Table 5. *Duration of breast-feeding and nutritional status by W/A*

Duration of breast Feeding (month)	Nutritional status						Number of children	%
	Wellnourished		Moderate malnutrition		Severe malnutrition			
	Number	%	Number	%	Number	%		
0 - 6	78	46.7	71	42.5	18	10.8	167	54.4
- 12	40	43.0	45	48.4	8	8.6	93	30.3
- 24	14	42.4	17	51.5	2	6.1	33	10.8
- 24	0	0.0	1	100.0	0	0.0	1	0.3
No breast feeding	6	46.1	6	46.1	1	7.8	13	4.2

Supplementary food had been given before 2 month of age. Table 6 shows nutritional status according to age of giving supplementary food. The type of food given was rice porridge in 76 (80.9%), milk porridge in 13 (13.8%) and banana in 5 (5.3%).

BCG immunization had been given in 115 patients (63.9%), DPT I in 88 (48.9%), DPT II in 57 (31.7%), DPT III in 41 (22.8%), Polio I in 92 (51.1%), Polio II in 59 (32.8%), Polio III in 42 (23.3%), Measles in 18 (10.0%). Sixty five (36.1%) had had no immunization at all.

The relationship between immunization and nutritional status is shown in Table 7. Patients who had immunization (BCG, DPT, Polio, Measles) had in general a better nutritional status. Those who had had no immunization, 41,5% had moderate malnutrition and 32.3% were wellnourished.

According to the socio-economic status, the parents consisted of middle in 96 (53.3%), high in 45 (25.0%) and low in 39 (53.3%). The relationship between socio-economic level and nutritional status is shown in Table 8.

Patients were admitted to the hospitals because of various diseases. One-hundred and twenty four (68.9%) children contracted gastroenteritis with moderate or severe dehydration. Bronchopneumonia was found in 17 (9.4%) and purulent meningitis in 5 (2.8%) patients (Table 9).

The duration of hospitalization ranged from 1 to 30 days (mean 5 days). The outcome of the patients showed recovery in 142 (75.5%) and 38 (20.5%) were discharged against medical advice.

Table 6. *Age of giving supplementary food and nutritional status by W/A*

Age (month)	Nutritional status						Number of children	%
	Wellnourished		Moderate malnutrition		Severe malnutrition			
	Number	%	Number	%	Number	%		
0 - 2	38	40.4	43	45.7	13	13.9	94	52.2
- 4	24	54.5	18	40.9	2	4.6	44	24.5
- 6	6	54.5	5	45.5	0	0.0	11	6.1
- 8	3	50.0	3	50.0	0	0.0	6	3.3
- 10	0	0.0	1	100.0	0	0.0	1	0.6
- 12	0	0.0	1	50.0	1	50.0	2	1.1
> 12	13	59.1	6	27.3	3	13.6	22	12.2
Total	84	46.7	77	42.8	19	10.5	180	100.0

Table 7. *Distribution of immunization status by nutritional status (W/A)*

Immunization	Number of children	Nutritional status					
		Wellnourished		Moderate malnutrition		Severe malnutrition	
		Number	%	Number	%	Number	%
BCG	115	63	54.8	50	43.5	2	1.7
DPT I	88	49	55.7	57	42.0	2	2.3
Polio I	92	52	56.5	38	41.3	2	2.2
Measles	18	9	50.0	9	50.0	0	0.0
Nothing	65	21	32.3	27	41.5	17	26.2

Table 8. *Distribution of nutritional status (W/A) according to socio-economic level*

Nutritional status	Number of children	Socio-economic level					
		High		Middle		Low	
		Number	%	Number	%	Number	%
Wellnourished	81	21	25.9	48	59.3	12	14.8
Moderate malnutrition	80	24	30.0	39	48.7	17	21.3
Severe malnutrition	19	0	0.0	9	47.4	10	52.6

Table 9. *Disease of the patients*

No.	Disease	Number	%
1.	Gastroenteritis + dehydration	124	68.9
2.	Bronchopneumonia	17	9.4
3.	Purulent meningitis	5	2.8
4.	Febrile convulsion	3	1.7
5.	Encephalitis	2	1.1
6.	Tetanus	2	1.1
7.	ALL	2	1.1
8.	Invagination	2	1.1
9.	Typhoid fever	2	1.1
10.	Neonatal tetanus	2	1.1
11.	Kwashiorkor	1	0.6
12.	Others	10	10.0

Discussion

In this study, among the underfive patients, infants (0-1 year) were predominantly found. Male - female ratio was 1.5 : 1.

Based on W/A parameter, most of the patients were wellnourished. This is because of the fact that most of them were children under 1 year where nutritional status is usually better than those beyond 1 year. Therefore W/A parameter was used for further analysis. However, according to W/H and MUAC, about one third of them had moderate malnutrition.

According to W/A, it seemed that the number of moderate and severe malnutrition decrease in comparison to the same studies by Meliala (1981) and Rani (1990) [6,7]. In Dr. Pirngadi Hospital, Meliala (1981) [6] found malnutrition in 95.83% and Rani (1990) [7] found moderate and severe malnutrition in 67.0% and 33.0% , respectively. However, the incidence of moderate and severe malnutrition in this study did not indicate the prevalence in the population.

On discharge, there was only little improvement of the nutritional status and the difference was not significant ($p > 0.05$). No cases fell to worse condition. This might be due to the fact that the duration of hospitalization was relatively short (5 days), and the predominant disease gastroenteritis.

Breastfeeding pattern was almost similar with previous studies [6,7,8] i.e. more than half of the children were breast-fed up to six months and at the age of 1 year there remained only 30.0% who were still on breast-milk. The longer the breastfeeding was given, the more the children suffered from undernutrition. Early introduction of supplementary food (younger than 3 months) may reduce breast-milk production and increase the possibility of

infection. Meanwhile the composition of supplementary food didn't meet the requirement of calorie and protein.

Patients immunized with BCG, DPT, Polio or Measles had better nutritional status compared to those who did not get any immunization. Immunization is a mean to increase the host-defence mechanism, which in turn will influence the nutritional status of the children.

Socio-economic level is a contributing factor in undernutrition. Low socio-economic level affects the health of the family and underfive children are mostly affected. However, any improvement of the socio-economic level didn't always indicate a better nutritional status [9].

In this study among wellnourished patients, 59.3% of them came from middle socio-economic families and only 25.9% from high level. But in patients with severe malnutrition more than half came from low socio-economic families.

Undernutrition and infection are commonly found together. Gastroenteritis was still the leading disease of the underfive children, followed by bronchopneumonia. This finding was similar to the study by Rani et al. (1990) who found gastroenteritis in 84.5% and bronchopneumonia in 7.48% [7].

Relatively short breastfeeding, early introduction of supplementary food, low quality of diet and the presence of gastroenteritis has been well-known as multi-causative factors of undernutrition [7,8,10].

It is likely that to prevent undernutrition, a program must be designed to increase the quality of family life such as mother's education, family planning, nutritional education, good environmental sanitation, as well as the macro social aspect such as higher family income, etc.

Conclusion

1. Nutritional status of the underfive children at the pediatrics ward of Dr. Pirngadi hospital Medan according to Weight/Age parameter was 46.7% wellnourished, while according to Weight/Height 33.9% had moderate malnutrition.

2.There was no significant difference between nutritional status on admission and on discharge.

3.In 54.4% of the cases, breastfeeding had been given until 6 months of age, while in 52.2% of the cases supplementary food had been given before the age of 2 months.

4.The mean duration of hospitalization was five days.

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