ORIGINAL ARTICLE

Bronchopneumonia with Measles in Infants and Children at the Department of Child Health School of Medicine, University of North Sumatera/ Dr. Pirngadi Hospital Medan (January 1985 - December 1989)

by

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Abstract

A retrospective study was done on patients with bronchopneumonia hospitalized at the Dr. Pirngadi Hospital, Medan/School of Medicine, University of North Sumatera, during January 1985 through December 1989.

The purpose of this study is to assess the morbidity and mortality of bronchopneumonia with measles and the nutritional status of the patients.

Out of the 14.082 patients admitted, 1310 children suffered from bronchopneumonia (10.7%). Ninetynine of them were also with measles (7.6%).

Most of the patients with bronchopneumonia without measles were in the age group 0-1 year (58.7%). The mortality was 24.8% and the highest mortality rate was in the age group of 4-5 years (34.6%).

Most of the patients with bronchopneumonia and measles were in the age group of 1-2 years (30.3%). The mortality rate of bronchopneumonia with measles was 22.2% and the highest mortality rate was in the age group of 3-4 years (35.7%).

Bronchopneumonia with or without measles occurred more in malnourished patients rather than in well-nourished cases.

All of the patients who had bronchopneumonia with measles in the present study had never been immunized against measles.

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Introduction

Bronchopneumonia is a severe acute respiratory disease commonly occurring in children.

In Dr. Pirngadi Hospital, Medan, bronchopneumonia (in a 1976-1980 study) ranked second after gastroenteritis (1). Measles is a very contagious viral infection, characterized by fever, cough, conjunctivitis, skin rash, desquamation, and hyperpigmentation (2). The immunocellular system defect maybe responsible for the susceptibility of intracellular infections like measles and varicella (3). Cellular immune response in malnourished children reduces the lymphocyte product and gives a chance for the virus to multiply logarithmically (4). Malnutrition gives opportunity to infection, worsens the clinical course and increases the frequency of complication, severity and mortality of the infection (3).

In general, the prognosis of measles in older children is better compared with those in infants, and the highest mortality rate is of severe bronchopneumonia (2). Bronchopneumonia in patients with measles may be caused by the measles virus itself, secondary infection or both (5,6). If the pneumonia occurs in the prodromal stage it is assumed caused by the virus itself, but if it occurs in reconvalescence stage, it is usually caused by secondary bacterial infection (7).

Several authors reported that the mortality rate of bronchopneumonia is high, as stated by Saragih (1971) who reported a mortality rate of 31.5% (8); several other authors stated that bronchopneumonia is a common complication with high mortality rates, where the nutritional status may play an important role in bronchopneumonia with measles.

The purpose of this study is to evaluate the morbidity and mortality rates in patients with bronchopneumonia with and without measles, and to assess the nutritional status of those patients.

Materials and methods

The retrospective study was done on hospitalized patients with the diagnosis of bronchopneumonia with or without measles, at the Department of Child Health Dr. Pirngadi Hospital Medan, from January 1985 to December 1989.

The diagnosis of bronchopneumonia was established by history, clinical, and radiological examinations. The diagnosis of measles was based on history and clinical signs.

The nutritional status were defined based on the PEM classification as recommended by the Lokakarya Antropometri 1975, Puslitbang Gizi 1978 (9).

All patients were tabulated based on age groups, number of patients, number of deaths, nutritional status, history of measles immunization in patients with bronchopneumonia with measles.

Results

1. Of all 14,082 patients admitted to the pediatric ward of Dr. Pirngadi Hospital during 5 years (Jan. 1985 - Dec. 1989), 1310 cases (10.7%) suffered from bronchopneumonia. Ninetynine patients also suffered from measles.
   Bronchopneumonia with measles appeared predominantly in the age group of 1-2 years (30,3%).
2. The mortality rate of patients with bronchopneumonia without measles was 24.8% and mostly found in the age group of 4-5 years (34,6%), while the case fatality rate in patients who had bronchopneumonia with measles was 22.2% and mostly in the age group of 3-4 years (35.7%).

Table 6 and 7 show higher mortality in patients who had protein energy malnutrition (PEM). None had a history of measles immunization in the group of bronchopneumonia with measles.

Table 1 : *Distribution of bronchopneumonia patients with and without measles*

Age (year)	Bronchopneumonia Number of cases	%	Bronchopneumonia with measles Number of cases	%
– 1	763	58.7	22	22.2
– 2	225	17.27	30	30.3
– 3	100	7.6	21	21.2
– 4	48	3.7	14	14.1
– 5	35	2.7	9	9.1
> 5	109	8.3	3	3.0
Total	1310	100.0	99	100.0

Table 2 : *Mortality rate in bronchopneumonia patients with and without measles by age group*

Age (year)	Bronchopneumonia without measles			Bronchopneumonia with measles		
	No. of cases	Death	%	No. of cases	Death	%
– 1	741	198	26.7	22	7	31.8
– 2	225	57	25.3	30	7	23.3
– 3	79	17	21.5	21	2	9.5
– 4	34	7	20.6	14	5	35.7
– 5	26	9	34.6	9	1	11.1
>5	126	12	11.3	3	–	0.0
Total	1211	300	24.8	99	22	22.2

Table 3 : *Nutritional status of bronchopneumonia patients with and without measles*

	Nutritional status						Total
	Well nourished		Mild & Moderate Malnutrition		Severe Malnutrition		
	No. of cases	%	No. of cases	%	No. of cases	%	
Broncho-pneumonia alone	397	32.8	529	43.7	285	23.5	1211
Broncho-pneumonia with measles	13	13.1	66	66.7	20	20.2	99

Table 4 : *Distribution of the bronchopneumonia patients without measles by nutritional status and age group*

Age (year)	Nutritional status						Total
	Well nourished		Mild & Moderate Malnutrition		Severe Malnutrition		
	No. of cases	%	No. of cases	%	No. of cases	%	
– 1	329	44.4	272	36.7	140	18.9	741
– 2	27	12.0	104	46.2	94	42.8	225
– 3	10	12.7	38	48.1	31	39.2	79
– 4	7	20.6	17	50.0	10	29.4	34
– 5	5	15.4	12	46.2	10	38.5	26
>5	20	18.9	86	81.1	----	----------	106
Total	397	32.8	529	43.7	285	23.5	1211

Table 5 : *Distribution of patients with bronchopneumonia plus measles based on nutritional status by age*

Age (year)	Nutritional status						Total
	Well nourished		Mild & Moderate Malnutrition		Severe Malnutrition		
	No. of cases	%	No. of cases	%	No. of cases	%	
– 1	7	31.8	13	59.1	2	9.1	22
– 2	3	10.0	16	53.3	11	36.7	30
– 3	1	4.8	16	76.2	4	19.0	21
– 4	1	7.1	10	71.4	3	21.4	14
– 5	1	11.1	8	88.9	–	--------	9
>5	–	--------	3	100.0	–	--------	3
Total	13	13.1	66	66.7	20	20.2	99

Table 6 : *Nutritional status of patients with bronchopneumonia alone who died according to age*

Age (year)	Nutritional status						Total
	Well nourished		Mild & Moderate Malnutrition		Severe Malnutrition		
	No. of cases	%	No. of cases	%	No. of cases	%	
– 1	54	27.3	87	43.9	57	28.8	198
– 2	6	10.5	13	22.8	38	66.7	57
– 3	–	--------	6	35.3	11	64.7	17
– 4	1	14.3	4	57.1	2	28.6	7
– 5	–	--------	3	33.3	6	66.7	9
> 5	2	16.7	10	83.3	–	--------	12
Total	63	21.0	123	41.0	114	38.0	300

Table 7 : *Nutritional status of patients with bronchopneumonia plus who died according to age*

Age (year)	Nutritional status						Total
	Well nourished		Mild & Moderate Malnutrition		Severe Malnutrition		
	No. of cases	%	No. of cases	%	No. of cases	%	
– 1	2	28.6	5	71.1	–	--------	7
– 2	–	--------	3	42.9	4	57.1	7
– 3	–	--------	1	50.0	1	50.0	2
– 4	1	20.0	1	20.0	3	60.0	5
– 5	–	--------	1	100.0	–	--------	1
> 5	–	--------	–		–	--------	–
Total	3	13.6	11	50.0	8	36.4	22

Discussion

Since January 1985 to December 1989, 14082 patients were admitted to the Pediatric ward of Dr. Pirngadi Hospital, Medan, (excluding those of Division of Perinatology) out of which 1310 (10.7%) had bronchopenumonia. Ninety nine patients also suffered from measles. This in accordance with that of Lubis (1990) who had found 10.68%, ranked second after gastroenteriris in hospitalized cases (1).

The highest percentage of bronchopneumonia cases with measles was found in the age group 0–1 year (58.7%); this is similar to the results reported by Saragih (1977) who reported 58%, from the same hospital (8). In the age group of 0-3 years it was 83.5%, while bronchopneumonia with measles was highest in the age group 1-2 years (30.3%). In the age group of 0-3 years it was 73.7%; it is different from Daulay's report where the highest percentage was in the age group of 3-4 years (10). Rangkuti et al. (1980) reported the highest incidence of bronchopneumonia with measles was in age group of 1-2 years (11).

Said and Rahajoe (1990) reported pneumonia measles in 20.75% of all pneumonia cases admitted in 1988 at Pediatric ward in Dr. Cipto Mangunkusumo Hospital, Jakarta (7). The mortality was 12.4%.

In this study, bronchopneumonia without measles showed a mortality rate of 24.77% and the highest was in the age group of 4-5 years (34.6%); In patients without measles it was 22.2%, and the highest was in the age group 3-4 years (35.7%). In the age group of 0-1 year it was 31.8%. Daulay (1983) found 23.4% of those who had no measles, and 27.3% for bronchopneumonia with measles (10).

The patients with bronchopneumonia without morbilli were 32.78% wellnourished, 43.7% mild and moderately malnourished and 23.5% had severe malnutrition; while in bronchopneumonia with morbilli, they were wellnourished in 13.1%, mild and moderately malnourished in 66.7% and severe malnutrition in 20.2%.

The nutritional status of patients with bronchopneumonia alone who died were wellnourished in 21%, mild and moderately malnourished in 41% and severe malnutrition in 38%; while of those who had measles were wellnourished in 13.6%, mild and moderately malnourished in 50% and severely malnourished in 36,4%. Munir et al. (1982) found no mortality in wellnourished, 17% in moderately malnourished, and 41.2% in severely malnourished cases with bronchopneumonia with measles (12).

In this study, all patients who had bronchopneumonia with measles had never been immunized against measles.

Conclusions

1. The morbidity rate of bronchopneumonia at the Pediatric ward of Dr. Pirngadi Hospital, Medan was 10.7% of all patients hospitalized during January 1985 – December 1989. This figure is similar to 10.9% figure reported by Lubis (1990) (1).
2. Patients with bronchopneumonia were

most predominant in the age group of 0-1 years (58.7%) and 83.5% were in the age group of 0-3 years; the case fatality rate in the age group of 4-5 years was 34.6 %. Ninety nine of 1310 cases (7.6%) were with measles, distributed mostly in the age group of 1-2 years (30.3%) and 73.7% were on the age group of 0-3 years; the case fatality rate was 22.2%, the highest being in the age group of 3-4 years (35.7%); in the age group of 0-1 year it was 31.8%.

3. The nutritional status of patients with bronchopneumonia without measles were : wellnourished 32.8%, mild and moderately malnourished 43,7% and severely malnourished in 23.5%; while in those who died 21% were wellnourished, 41% mildly and moderately malnourished and 38% were severely malnourished. In patients with bronchopneumonia with measles the 13,7% were wellnourished, 66,7% mild and moderately malnourished while in those who died 13.6% were wellnourished, 50% mild and moderately malnourished and 36.4% severely malnourished.
4. None of patients who had bronchopneumonia with measles had ever been immunized against measles.

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