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Treatment of Bronchopneumonia with Spiramycine (Rovamycine)

by

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Abstract

Fifty-seven children with bronchopneumonia, comprising 32 male and 25 female, were admitted to the Department of Child Health, Dr. Kariadi Hospital, Semarang, during the period of May 1972 — May 1973. Varying in ages between 16 days and 7 years, 36 of them were less than one year old. They were treated with spiramycine (Rovamycine) given orally in a dosage of 50 mg./kg. body weight daily in three divided doses. The failure was 9 out of 57 cases (15.8%) and in infants 7 out of 36 cases (19.4%). The culture of infants revealed 36.1% staphylococcus and in older children showed 4.8%. All cases of staphylococcus as a single cause which was treated with spiramycine gave good results. No side effects of spiramycine were noted. The study showed that spiramycine has a value in the treatment of childhood bronchopneumonia especially in staphylococcal infections in infants.

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Introduction

In Indonesia, the mortality of childhood bronchopneumonia, especially in infants, is still high. The overall mortality rate is 7 — 28.6% (Sutedjo et al., 1961; Hanafiah et al., 1968; Nugroho et al., 1971; Soemantri et al., 1970) and in infants it is 36.1% (Nugroho et al., 1971). Several authors reported that staphylococcal infection predominated in infancy bronchopneumonia but not in older children (Nugroho et al., 1971; Mimica et al., 1971; Lydia, 1968).

Based on these reports, a clinical trial was performed to evaluate the effectiveness of spiramycine in childhood bronchopneumonia. Spiramycine is found clinically effective in infection due to staphylococcus (including strains resistant to penicillin), streptococcus, and pneumococcus. It is also effective in infection due to Neisseria gonorrhoe, Hemophilus pertussis, Entamoeba histolytica, and other infections caused by rickettsiae (Pinnert-Sindico et al., 1954; Lepper et al., 1955-1956; Hudson et al., 1956; Jeljaszewiez and Gancerzewiez, 1961).

Spiramycine was discovered by Pinnert-Sindico and co-workers in 1954, produced by microorganisms of the species Streptomyces ambofaciens. The first isolation was as the sulphate but later on exclusively as the base. Spiramycine base is a white, odorless, amorphous powder with a bitter taste and it is about 2 percent soluble in water at room temperature. This antibiotic is a member of the group of antibiotics which are collectively known as macrolides and include erythromycine, oleandomycine, and in vitro has a spectrum corresponding closely to that of erythromycine (Pinnert-Sindico et al., 1944; Garrod, 1957; Benazet and Dubost, 1959). This antibiotic has been used successfully in upper and lower respiratory tract infections (Lepper et al., 1956; Hudson et al., 1956), and skin infections due to staphylococcus (Pinnert-Sindico et al., 1954-1955; Jeljaszewiez and Gancerzewiez, 1961). It seemed to have particular pharmacological characteristics viz. persistent and high concentration in the tissues especially in the lungs and the spleen (Pellerat, 1963).

Material and methods

During the period of May 1972 — May 1973, 57 children with bronchopneumonia, comprising 32 male and 25 female, were admitted to the Department of Child Health, Dr. Kariadi Hospital, Semarang. Their ages varied from 16 days to 7 years. The diagnosis was based on fever, dyspnoea, with or without cyanosis and moist rales in the lungs (Sutedjo et al., 1961).

Spiramycine was administered orally to the patients in a dosage of 50 mg./kg. body weight daily divided into 3 doses for ten days. Rapid digitalisation with cedilanid was given to patients with heart failure. Initial dose was 0.03 mg./kg. body weight given in 18 hours and continued with a maintenance dose of 1/5 — 1/10 of the initial dose daily. Bacterial culture, sensitivity test (mate-

rial from Auger Suction) and radiological studies of the lungs were performed twice with an interval of 2 or 3 weeks for each patient. The follow-up of treatment was recorded viz. temperature, respiration rate, pulse rate, disappearance of dyspnoea, and complications.

Cases which proved clinically to have tuberculous process, who could not be given oral treatment (severe vomiting, cyanosis), and those with serious complications (meningitis, typhoid fever, dengue hemorrhagic fever) were excluded from this trial. The patients were discharged after 2 days free of fever and the disappearance of rales, cyanosis, and dyspnoea. The treatment itself had to be continued for 10 days. The treatment was considered a failure when the patient died or the physical, laboratory, and radiological examinations became worse after 10 days of treatment.

Results

The children under investigation consisted of 32 male and 25 female. Their ages ranged from 16 days and 7 years; 36 of the children were under one year of age. Our material consisted mostly of children from low socio-economic families. The average maximum temperature was 38° C and the temperature subsided between 3 to 5 days after treatment. Cyanosis was found in 30 out of 57 children (52%); 16 children developed heart failure (28.1%). This heart failure was successfully treated mostly within 18 to 24 hours. The average disappearance of rales was 3.7 days. The laboratory finding revealed a white blood cell count between 6,700 — 19,600/cmm.

The average day of hospitalization was 8.3 days. There was a significant difference on bacterial culture between children under and above one year of age. All staphylococcal infection were sensitive to rovamycine, except in one resistant case who had a combination of staphylococcus pyogenes and streptococcal infection.

In this study, 48 children (84.2%) gave good results and 9 children (15.8%) showed failure in treatment, including 2 children who died. The failure of this trial in infants (children under one year of age) occurred in 7 cases (19.4%). All cases with staphylococcus as a single cause were successfully treated, while one case with a combination of staphylococcus and streptococcus was not (Table 1). Twenty-two out of 57 children in this study were suffering from other diseases or complications such as Protein-Calorie-Malnutrition (P.C.M.), middle ear infection, gastroenteritis, febrile convulsion, and malaria (Table 3). No side effects caused by rovamycine were noted.

Discussion

As shown on Table 4, the clinical signs in this study were the same as the study of Soemantri et al. (1970); there was a difference in the average day of hospitalization (7.8 and 8.3 days respectively). In Santiago, Mimica et al. (1971) found that bronchopneumonia in infants was mostly caused by staphylococcus aureus; while diplococcus pneumonia was

the primary cause of bronchopneumonia in children above 2 years of age. Staphylococcal infection was found in infants and in many patients suffering from leukemia, diabetes mellitus, aplastic anemia, and serious surgical treatment. Staphylococcus albus is a non-pathogenic bacteria which in certain circumstances can be virulent such as in debilated children. In this situation it gave a high mortality rate (Morse, 1965).

Study on the etiology of childhood bronchopneumonia by lung puncture (Nugroho et al., 1971) revealed: staphylococcus 63.6%, diplococcus 0%; and by the Auger suction (Auger, 1939; Lydia, 1968) showed: staphylococcus 17% and diplococcus 13%. While Crofton (1966) in his study found staphylococcus 1% and diplococcus 30.9% as the etiology. This study showed that staphylococcal infection in infants was higher (13 cases or 36.1%) than children over one year (1 case or 4.8%) (Table 1).

Most of the cases studied by Mimica et al. (1971) and Nugroho et al. (1971) were in moderate or severe states and from low socio-economic families. The failure of their trial in infants was 36.1% (treatment with Penicillin Procain, Streptomycin). The overall failure of this trial was 15.8%. Study by Sutedjo et al. (1961) and Hanafiah et al. (1968) reported that the overall mortality was 17.1% and 14 — 16% respectively (treatment with Procain Penicillin, Streptomycin, and Chloromycetine). Based on the results obtained, it is shown that spiramycine has a value in the treatment of childhood bronchopneumonia, especially in staphylococcal bronchopneumonia in infants.

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TABLE 1 : Culture and sensitivity test results in 57 childhood bronchopneumonia.

	Children under one year of age				Older children				Failure
	No. cases	%		Sensitivity to Rovamycine	Failure	No. cases	%	Sensitivity to Rovamycine	
Streptococcus anhemolyticus	14	38.9		sensitive	3	8	38.1	sensitive	2
Staphylococcus:									
S. Aureus	6	16.6	19.4	sensitive	—	—	—	—	—
S. Albus	1	2.8		sensitive	—	—	—	—	—
Streptococcus + Staphylococcus:									
Str. anhemolyticus + Staph. C. aureus	4	11.1	16.0	sensitive	—	—	—	—	—
Str. anhemolyticus + Staph. albus	1	2.1		sensitive	—	1	4.8	sensitive	—
Str. anhemolyticus + Staph. pyogenes	1	2.8		resistant in vitro	1	—	—	—	—
Diplococcus pneumonie	—	—	—	—	—	2	9.5	sensitive	—
Diplococcus pneumonie + Streptococcus anhemolyticus	3	8.3		sensitive	1	1	4.8	sensitive	—
Miscellaneous:									
b. alkaligenes	1	2.8		sensitive	1	1	4.8	sensitive	—
b. lactoaurogenes	1	2.8		sensitive	1	2	9.5	sensitive	—
b. paracoli	—	—	—	—	—	1	4.8	—	—
Negative	4	11.1		—	—	5	23.7	—	—
T o t a l	36	100		—	7	21	100	—	

Strep. anhem. resistant. Staph pyogen. sensitive

TABLE 2 : *Result of treatment with spiramycine in 57 cases*

Age	No. cases	Good results	Failure
< 1 year	36	29 (80.6%)	7 (19.4%)
> 1 year	21	19 (90.6%)	2 (9.5%)
0 — 7 years	57	48 (84.2%)	9 (15.8%)

TABLE 3 : *Associated diseases and complications*

1. Protein Calorie Malnutrition (P.C.M.)		
— moderate	:	5 cases
— severe	:	5 cases
2. Otitis Media Purulenta	:	1 case
3. Asthmatic Component of Bronchopneumonia	:	4 cases
4. Gastroenteritis	:	3 cases
5. Febrile Convulsion	:	2 cases
6. Morbilli	:	1 case
7. Tertian Malaria	:	1 case

TABLE 4 : *Comparison of treatment between spiramycine and penbritin.*

Signs	Penbritin (Soemantri et al., 1970)	Rovamycine (Soejono, 1972)
Max. temperature	average 38° C	average 38° C
Temp. subside	,, 4.65 days	,, 3 — 5 days
Disappearance of dyspnoea	,, 3.34 days	,, 3.7 days
Disappearance of rales	,, 5.2 days	,, 5.6 days
Days of admission	,, 7.6 days	,, 3.3 days