ORIGINAL ARTICLE

Measles at The Department of Child Health, Cipto Mangunkusumo Hospital, Jakarta 1993

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ABSTRACT Expanded Programm of Immunization on measles in Indonesia has been implemented since 1985. The coverage of immunization at the first year was only 0.5%, increasing year by year and finally in 1990 its coverage was 80%. Retrospective study on secondary data of measles patients under 5 years of age who were hospitalized at the Department of Child Health/Dr. Cipto Mangunkusumo Hospital during 1993 is presented. The diagnosis was based on the clinical findings, such as fever, specific distribution of macula-papular skin eruption, and conjungtivitis. Total cases was 45 among 3348 (1.34%) hospitalized cases with case fatality rate (CFR) 8.9% (4 among 45 cases). This condition was similar to the condition in 1992, but was better than the period of 1986-1991. The most common complications were bronchopneumonia (25.2%), diarrhoea (6.5%), anemia (4.6%), encephalitis (3.7%). The cause of death were encephalitis (25%) and bronchopneumonia (11.1%). Measles immunization coverage was only 24.4% patients. On summary, measles patients admitted to Cipto Mangunkusumo Hospital were severe cases and most of them were not covered by immunization. **[Paediatr Indones 1997; 37:61-68]**

Introduction

Before 1970, measles in Indonesia was not considered as a serious problem. However, with many outbreaks followed by high mortality in several areas in Indonesia, this disease was then considered as a serious health problem.[1] A Study Group on Measles was initiated by the Department of Health Republic of Indonesia and the University of Indonesia Jakarta in 1987, supported by Ford Foundation and patronized by the Director General of Communicable Diseases Department of Health and Head of the

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Indonesian Research Institute. This study group serves as a center of information and supports the government's policy in reducing the morbidity and mortality rate of children in Indonesia, especially caused by measles and its complications.

The government of Indonesia aimed that the National Universal Child Immunization (UCI) is reached by 1990. UCI is a condition where first contact immunization coverage of infants for BCG, first DPT and first Polio vaccination reached 90% or more, and the complete immunization coverage for measles, third DPT and third Polio vaccination has reached 80% or more.[2]

Immunization Coverage in Indonesia

Evaluation since 1981 showed that immunization coverage for measles in Indonesia is lower than for BCG and DPT. In 1988 it was recorded that immunization coverage for first DPT and first Polio was more than 80%, third DPT 70.7% and third Polio 73.4%, while for measles 64%. Previous data showed immunization coverage for measles was 45% (1986) and 57% (1987).[3,4]

An immunization schedule designed to reduce the morbidity and mortality of 6 diseases that can be prevented by immunization (tuberculosis, diphtheria, pertussis, polio, tetanus and measles) and given since early age (before the infant's first birthday) is shown in Table 1.

Table 1. Immunization schedule

Age (month)	Mass immunization	Individual Immunization
0-1	BCG	-
2	First DPT, First Polio	BCG
3	Second DPT, second polio	First DPT, first polio
4	Third DPT, third polio	Second DPT, second polio
5	-	third DPT, third polio
9	Measles	Measles

This schedule was made based on seroepidemiological studies and implementation feasibility with optimal results in reducing morbidity rate. The problem is that measles is endemic and contagious in infants and early childhood. Even through immunization coverage is high, the number of children not covered by immunization coverage

by immunization is still high. As an example, immunization coverage in East Java is 65% but 325 000 infants-has not been immunized. In the contrary, in Maluku the immunization coverage is 40% (the lowest in Indonesia) but the number of unimmunized infants is less than 50 000. Each province gave a different picture. Ano- ther example is Bengkulu where the immunization coverage is 70% but 10 000 infants is not protected from measles.[3,4]

With the condition mentioned above, an outbreak of measles can occur even through the immunization coverage is high. An immunization coverage of 64% with an annual number of births as large as 5 million means that 1.8 million infants every year are susceptible to measles. Fifty percent of them are found in Java, while the rest is evenly distributed in other provinces. This condition can be explained since Indonesia consists of 27 provinces made up of thousands of islands with tropical climate and a variety of socioeconomic conditions and culture. Reports from several hospitals from the main cities in Indonesia gave various data, but some characteristics of hospitalized patients with measles gave a similar picture.[5]

Epidemiological data on measles in Indonesia (1989 and 1990), according to the subdirectory of surveillance, directory of communicable diseases is as follows (Table 2).

Table 2. Epidemiological data on measles is Indonesia

Year	Incidence rate	CFR	Immunization coverage
1989	26.3/10 000	3.5%	64.2%
1990	17.0/10 000	2.12%	68.4%

The average epidemiological profile of measles indicates improvement, lower incidence and higher immunization coverage. Incidence rates in 5 provinces (Bali, South Sulawesi, Aceh, Yogyakarta, South East Sulawesi) have reached 4.75- 8.02%, while in Maluku, West Irian, Jakarta, North Sulawesi and East Timor it is still 36.3 to 57.9%. This indicates that Jakarta is still an endemic area due to increasing urbanization and population.[6]

To obtain an epidemiological picture of measles, a study on this disease was conducted in the Department of Child Health, Dr. Cipto Mangunkusumo Hospital, Jakarta (top referral and teaching hospital in Indonesia). This study was conducted in 1993 and the result was compared to data of previous years. These data was expected to show a decrease in morbidity and mortality of measles following the implementation of the immunization strategy.

Dr. Cipto Mangunkusumo is the located in the center of Jakarta, the capitol city of

Indonesia. Jakarta has a dense population of about 8 million (1993) which is made up of various ethnics who urbanized to Jakarta with a wide range of socioeconomic condition. The people's awareness of health is still low, including their obedience to undergo immunization, especially from the middle and lower economic class. Patients with measles consulted to the Department of Child Health, Dr. Cipto Mangunkusumo Hospital are mostly severe and with complications, coming from the middle low economic class.

Methods

A retrospective study was conducted using secondary data from the medical records of all measles cases at the Department of Child Health, Cipto Mangunkusumo Hospital from 1987 until 1993. Data were analyzed and compared to data from previous years. The diagnosis of measles was based on clinical examination, consisting of fever lasting up to 5 days, conjunctivitis, rhinitis, stomatitis, cough and a characteristic maculopapular eruption followed by hyperpigmentation which gradually faded. The clinical diagnosis was not supported by serological examinations.

Complications can occur either on the eruptive stage or convalescence. Diagnosis of bronchopneumonia was based on clinical and radiological examinations. Diarrhea was diagnosed clinically. Encephalitis was diagnosis if there were high fever, lost of consciousness and from EEG and lumbar puncture examinations.

Results and Discussion

Incidence and crude fatality rate (CFR) of measles

Tables 3 and 4 show that the average number of patients hospitalized for measles is decreasing every year, before 1987: 116/year with CFR 10-20%, 1987-1993: 76/year, (3%) with CFR 10.2%. It is also noted that for the last 4 years (1990-1993) the average number of cases hospitalized has decreased to 37/year (1.2%). This indicates the successful result of expanded measles immunization coverage program since 1981.

Complications

During 1985-1986, bronchopneumonia was the most frequent complication of measles followed by diarrhea and encephalitis. Mortality was frequently caused by encephalitis and bronchopneumonia.[5] Apparently it is decreasing in 1993. Table 5 shows the decrease of morbidity and mortality of each type of complications. The nutritional condition of measles patients is usually poor, death is more often in this group (1 out

Table 3. Proportion and CFR of measles patients with complications at the Dept. of Child Health, Cipto Mangunkusumo Hospital/Medical School University of Indonesia, 1977-1986*

Year	Total No. patients	No. Patients hospitalized	CFR	
			N	%
1977 - 1979		162	19	12.0
1980		122	22	28.0
1981		80	16	20.0
1982		105	9	11.0
1983		98	11	19.0
1984	3655	271	32	11.8
1985	3606	77	10	12.9
1986	4066	210	21	10.0
Mean/year		116	10	20.0

* Adapted from Sri Rezeki (1987).

Table 4. Proportion and CFR of measles patients with complications (1987-1993)

Year	Total patients	Measles patients (hospitalized)		CFR (%)
		N	%	
1987	4726	108	2.3	11.1
1988	5025	166	3.3	13.3
1989	3560	109	3.1	17.4
1990	4675	42	0.9	11.9
1991	2707	30	1.1	3.3
1992	2429	32	1.3	9.4
1993	3348	45	1.3	8.9
Mean/year		76		10.2

of 3 undernutritioned cases) (Table 6). Data from 1985-1986 show that mortality in undernutritioned patients occur in 12 out of 46 cases (34.8%). In these cases, besides low intake of nutrition there is a large amount of protein loss which makes the situation worse.[5]

Table 5. Proportion of complications and accompanying diseases of measles patients (1985-1986 and 1993)

Complications and accompanying disease	1985-1986				1993			
	Patients		CFR		Patients		CFR	
	N	%	N	%	N	%	N	%
Pneumonia	245	85.4	26	18	27	25.2	3	11.1
Diarrhea	67	23.3	0	0	7	6.5	0	0
Encephalitis	24	8.4	9	37.5	4	3.7	1	25
Anemia*	137	66.0	26	26.9	5	4.7	0	0
Malnutrition*	46	16.0	12	26.9	3	2.8	1	33
Febrile convulsion	32	11.1	0	0	1	0.93	0	0

* accompanying diseases

Table 6. Mortality of measles patients according to nutritional status

Nutritional status	No.patients	Mortality	CFR (%)
Good	13	1	7.7
Fair	29	2	6.9
Poor	3	1	33.3
Total	45	4	8.9

Table 7. Age distribution and death of measles ptients with complications at the Department of Child Health Dr. Cipto Mangunkusumo Hospital/Medical School University of Indonesia 1993

Age (years)	1985-1986			1993		
	No.patients	CFR		No.patients	CFR	
		N	%		N	%
< 1	55	8	14	9	0	0
1-4	206	22	10.7	23	3	13
>5	26	1	0.3	13	1	7.7
Total	287	31	11.3	45	4	8.9

Table 8. Age distribution of measles with complications of bronchopneumonia and encephalitis

Age distribution (year)	Complications	
	Bronchopneumania	Encephalitis
< 1	5 (18.5%)	8 (23.5%)
1-4	16 (59.3%)	19 (55.9%)
> 5	6 (22.2%)	7 (20.6%)
Total	27	34

Table 9. Age distribution and mortality of unimmunized measles patients

Age group (years)	No. unimmunized		Mortality	
	N	%	N	%
< 1	8	23.5	0	0
1-4	19	55.9	3	15.8
> 5	7	20.6	1	1.4
Total	34		4	

Immunization coverage of hospitalized measles patients

Hospitalized measles patients with complications who are immunized are 11 out of 45, meaning that 75.5% are not protected from measles. The case fatality rate was 8.9%.Mortality primarily occurs in the 1-4 years age group (Table 7). Table 8 shows that bronchopneumonia and encephalitis are the primary complications in the age group 1-4 years. Table 9 shows that 34 out of 45 (75.5%) cases were not immunized even through the immunization coverage in the area surrounding the hospital was 90%. Death in unimmunized patients primarilly occurs in the 1-4 years age group.

Conclusions

Based on the above data, it is concluded that the morbidity and mortality of measles at the Department of Child Health Dr. Cipto Mangunkusumo Hospital is high (CFR 10-20%) before the immunization coverage target was reached. But due to the expanded immunization program, especially after the year 1990, it is assumed that the

morbidity and mortality of measles will correlate with the success of the government's development of immunization coverage program (CFR 3-10%). Death occurs more often in the 1-4 years age group with poor nutritional status and mostly caused by encephalitis.

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