doi: 10.31674/mjmr.2018.v02i02.003

MJMR

CHARACTERISTICS OF CHILDREN UNDER FIVE YEARS WITH PNEUMONIA IN METROPOLITAN CITY

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ABSTRACT

Pneumonia is of the main diseases causing death among children. The risk factors of pneumonia among children under five years include age, decreased endurance of the body in children with malnutrition, receiving no exclusive breast milk, do not obtain immunization against measles and DPT. This research aims at identifying risk factors based on the characteristics of the children aged under five who have been treated for pneumonia. The study design is a description with a sample size of 34 children. The results of univariate data analysis found that the highest incidence of pneumonia in this study is aged between 12-23 months (38%), the lowest age is of 48-59 months (12%). The majority of children under five are male (55.9%), normal nutritional status (97.1%), getting exclusive breast milk (61.8%), got the measles and DPT immunization (70.6%), as well as 100% domiciled in Jakarta metropolitan city. Research results are expected to contribute in the prevention and treatment of pneumonia in children under five year as well as built the basis for further research.

Keywords: Characteristics of children under five years, Pneumonia, Metropolitan city

INTRODUCTION

Pneumonia is inflammation of the pulmonary parenchymal network that often occurs in infants and toddlers. Pneumonia is caused by bacteria, viruses, fungi and aspirated foreign bodies (Hockenberry &Wilson, 2012).

Risk factors for pneumonia include age, decreased endurance of the body in children with malnutrition, got no exclusive breast milk, didn't get measles and DPT immunization, overcrowding, pollution of the air outside the home or inside the home, the use of fuel wood for cooking and too much smoking done by the parents as well as the lack of education of the mother (Nurhaeni, Moralejo & Webber, 2007; Rudan *et al*., 2008; Hartati, Nurhaeni & Gayatri, 2012)

Pneumonia remains one of the top five causes of death among toddlers in the world with a population of 1 million in 2013 (WHO, 2014). The mortality rate of under-five toddler's suffering from pneumonia in Indonesia is 15.5%, and the highest number of toddler suffering from pneumonia is aged from 12-23 months (21.7%) (Ministry of Health of the Republic of Indonesia, 2012).

According to the data of National Institute of Health Research and Development (2013), period prevalence of pneumonia in Indonesia in the year 2013 occurred in the age group of 1-4 years. Period prevalence of pneumonia among toddler is 18.5 %. The highest incidence of pneumonia is present in the toddler age group of 12-23 months (21.7%). The five provinces that had the highest incidence of pneumonia among toddler is in East Nusa Tenggara (38.5%), Aceh (35.6%), Bangka Belitung (34.8%), West Sulawesi (34.8%), and Central Kalimantan (32.7%). Toddler pneumonia the treatment only 1.6 %. (Ministry of Health of the Republic of Indonesia, 2013). Distribution of patients treated especially toddlers affected of pneumonia in hospitals based on gender men (55.6%) women (44.4%) (Ministry of Health of the Republic of Indonesia, 2012).

According to the health profile of DKI Jakarta 2012, coverage of 26,910 children under five are affected with pneumonia cases (28%) of the amount estimated as much as 96,043 cases. The highest coverage is in the thousand islands Regency which has 149 cases (71%) of the amount estimated as many as 211 cases and the lowest coverage was in Central Jakarta of 911 cases (10%) of the amount estimated as much as 8,995 cases. Coverage of pneumonia in North Jakarta is of 3712 cases (22%) of the amount estimated as much as 16,457 cases (DKI Jakarta Health Office Prop, 2012).

This study aims to identify the characteristics of a toddler who suffered pneumonia, which can be used as a foundation for intervention to overcome pneumonia. Research carried out in The Regional Public Hospital Koja Jakarta Indonesia.

METHODS

This research uses descriptive design depicting the characteristics of children under five affected with pneumonia and is hospitalized. The number of samples are 34 toddlers, with the techniques of retrieval using *consecutive sampling*. The population of this research is all children who are aged between 1-<5 years, and diagnosed of pneumonia starting from April – May 2015.

RESULTS

Table 1 shows that, sex of children under five with pneumonia, majority are male that is 19 (56%). Nutrition status of toddlers is 97% normal. Children with pneumonia majority 21 (62%) get exclusive breastfeeding. The history of immunization of children under the age of 24 (71%) get immunization and 100% domiciled in Jakarta.

Table 2 shows that the mean age of children under five affected with pneumonia are 28.1 ± 13.1 months. Table 3 illustrates the proportion of children under five with pneumonia by age group. The highest incidence was in the 12-23-month age group (38%), the lowest is in the 48 to 59-month age group (12%).

DISCUSSION

Table1 Description of Gender, Nutritional Status, History of Breast Milk Exclusively,ImmunizationStatus Pneumoniain the Children Ward Regional Public Hospital Koja Jakarta Indonesia, April-May 2015 (n = 34)

Variable	Distribution	
	Total number of individual	Percentage (%)
a. Gender		
- Female	15	(44%)
- Male	19	(56%)
b. Nutritional Status		
- Skinny	1	(3%)
- Normal	33	(97%)
c. Exclusive Breast Milk History		
- Not Getting	13	(38%)
- Get	21	(62%)
d. Immunization History		
- Not Getting	10	(29%)
- Get	24	(71%)
e. Domicile		
- Jakarta	34	(100%)
- Outside Jakarta	0	(%)

Table 2 Description of the Average Age of Children affected with Pneumoniain, the Children Ward Regional Public Hospital Koja Jakarta Indonesia, April-May 2015 (n = 34)

The Variable Age	Value (month)
Mean	28.1
Standard Deviation	13.1
Median	27
IQR	20.5
Minimum – Maximum	13 – 59
CI 95%	19. 5 – 38.6

Table 3 Description of Children Age with Pneumonia in the Children Ward Regional Public Hospital Koja Jakarta Indonesia, April-May 2015 (n = 34)

Age Group	Proportion (%)
12 - 23 month	13 (38%)
24 - 35 month	12 (35%)
36 -47 month	5 (15%)
48 - 59 month	4 (12%)

The study showed that the majority of respondents aged 12-23 months, male sex, with normal nutritional status, get exclusive breastfeeding and get DPT and measles immunization. All respondents reside in Jakarta.

The majority of the children under five with pneumonia are aged between 12-23 months. The results of this study are similar to Ministry of Health of the Republic of Indonesia, (2012) which describes that the highest incident of pneumonia in children is aged between 12-23 months (21.7%), lowest age 48-59 (17.9%). The risk of pneumonia is greater in children under 2 years of age than the older children. This is because the immune system of children under 2 years is not perfect so it is easier to get infected (Hockenberry & Wilson, 2009).

The majority of subjects of this study were male. This study was also supported by the data from Ministry of Health of the Republic of Indonesia (2012) which describes the distribution of pneumonia patients who were hospitalized based on gender - male (55.6%) and female (44.4%). Population census data in Jakarta shows the number of male population 5,042,874 people (50.47%), women 4.948.914 people (49.52%) of the total population of 9,991,788 people (Provincial Central Bureau of Statistics DKI Jakarta, 2012).

Sunyataningkamto *et al.,* (2004) explains that male sex has higher percentage of being affected by pneumonia. This is because the respiratory tract diameter of boys is smaller than that of girls, there is a difference in body resistance between boys and girls.

The characteristics of nutritional status, history of exclusive breastfeeding and immunization status in this study differ from other studies that explain that risk factors for children under five with pneumonia are decreased immunity in children with malnutrition, exclusion of exclusive breastfeeding, lack of immunization (Nurhaeni, Moralejo, & Webber, 2007; Rudan *et al.,* 2008; Hartati, S., Nurhaeni, N., & Gayatri, D., 2012; Lamberti *et al.,* 2013).

This study shows the phenomenon of children under five with normal nutritional status, getting exclusive breastfeeding and immunization but still experiencing pneumonia. This occurs in children living in the metropolitan city with a dense environment and high air pollution.

The location of the respondent's residence is in Jakarta. Jakarta is a densely populated metropolitan city. The population of Jakarta according to 2010 census data is 9,991,788 people, the population in North Jakarta is 1,715,564 people. This number is increasing every year. North Jakarta population density is 11,697,56 / km^2 or 11,69 / m^2 (Central Bureau of Statistics of DKI Jakarta Province, 2014).

The area of the room that meets the health requirements based on the Minister of Health Decree number 829 / Menkes / SK / VII / 1999 is 8 m^2 / person. This means the Jakarta area is very densely populated. Population density is one of the risk factors for pneumonia (Nurhaeni, Moralejo, & Webber, 2007; Rudan *et al.*, 2008; Hartati, S., Nurhaeni, N., & Gayatri, D., 2012). The room is narrow and not in accordance with the number of occupants which can reduce the amount of oxygen in the room, so the occupants can easily contract the disease from other residents.

In addition, Jakarta is an industrial center with high environmental air pollution that comes from motor vehicle fumes or industrial smoke. This is related to the increasing number of motor vehicles and industrial plants in Jakarta. There are 14,618,313 vehicles in Jakarta. In Jakarta there are 1451 companies and industrial plants, the largest number in North Jakarta is

538 companies (37%) (Central Bureau of Statistics of DKI Jakarta Province, 2014).

According to the data from the Environmental Management Agency of DKI Jakarta Region the increasing number of mainly four air pollutants, namely carbon monoxide, nitrogen dioxide, lead and particles with a diameter of 10 micrometers or less (PM10) affect air quality in enclosed or confined spaces. Air pollution levels PM 10: 365, SO2: 365, CO: 365, NO: 364. This number has continued to rise over the past six years (Environmental Management Agency of DKI Jakarta Region, 2014).

Pollutant particles can be either solid or droplet. Deposition of the inhaled particles depends on several factors including particle size, airway anatomy, and breathing pattern. Particles> 10 μm will be filtered effectively in the nose and nasopharynx, then coughed or swallowed. Particles <10 μm will stop at the tracheobronkial branches. The particle deposition is between 1-2 μm in the pulmonary alveoli, whereas the <0.5 μm particle will reach the alveoli surface. Cleaning of particles from the airway by the mucosilier is very efficient in a few hours while in the alveoli is very slow. Very small dust particles in the air respiration will enter the cells and cause an inflammatory reaction in the mitochondria, producing interleukins and enzymes that interfere with cell metabolism (Hidayat, Yunus, & Susanto, 2012).

CONCLUSION

The results showed that the majority of respondents aged 12-23 months, male sex, normal nutritional status. The majority of children under five years get exclusive breastfeeding and get DPT and measles immunization especially to the respondents residing in Jakarta. Children under five years with normal nutritional status, exclusive breastfeeding, DPT and measles immunization and domicile in metropolitan city, but still experiencing pneumonia may be caused due to dense environment and environmental air pollution.

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