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ETIOLOGY AND RISK FACTORS FOR COMMUNITY ACQUIRED PNEUMONIA IN DR. ZAINOEL ABIDIN HOSPITAL, BANDA ACEH

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ABSTRAK

Pengelolaan CAP masih didasarkan pada pola mikrobiologi empiris. Tujuan penelitian ini adalah untuk menentukan profil etiologi dan faktor risiko - CAP di Ruang Pulmonologi, Rumah Sakit Dr Zainoel Abidin, Banda Aceh. Ini adalah penelitian deskriptif yang dilakukan terhadap 35 pasien yang didiagnosis CAP dan memerlukan rawat inap. Umumnya, 85,7% pasien CAP disebabkan oleh Klebsiella pneumonia (47,7%) dan Streptococcus pneumonia (20%). Menurut usia, 36,7% pasien CAP 45-64 tahun dan 46,7% lebih dari 64 tahun. Etiologi utama pada pasien lebih dari 64 tahun adalah Klebsiella pneumonia (71,4%). Ada 71,4% dari pasien CAP memiliki kebiasaan merokok aktif.

ABSTRACT

The management of CAP is still based on the empiric microbiological patterns. The purpose of this study is to determine the profile - etiology and risk factors - of CAP in Pulmonology ward of Dr. Zainoel Abidin Hospital Banda Aceh. This is a descriptive study that conducted 35 patients whom diagnosed as CAP and require hospitalization. Generally, 85.7 % of CAP patients are caused by Klebsiella pneumonia (47.7 %) and Streptococcus pneumonia (20%). According to the age of suffering, 36.7% CAP patients are 45-64 years old and 46.7% are more than 64 years old. The major etiology for more than 64 years old's patients is Klebsiella pneumonia (71.4%). There are 71.4% of CAP patients has an active smoking habit.

Keywords: Community Acquired Pneumonia (CAP), etiology

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INTRODUCTION

Pneumonia is one of the infectious disease that lead the cause of mortality in worldwide. CAP incident is estimated about 2-12 cases per 100 population per years. From 10-20 % of CAP cases require hospitalization and 20-50 % of them die. (el Moussaoui 2006; Prasenohadi 2010; Soedarsono 2010). There are some predisposition factors of pneumonia such as : co-morbid diseases, increasing of oropharinx colonization, aspiration, mukosilier transport disorder, malnutrition, immunology, endotracheal or nasogastric intubation. (Niederman 2004, el Moussaoui 2006, Prasenohadi 2010). Pneumonia is an acute inflammation process of lung parenchymal which asinus filled by inflammation fluid, with or without infiltration of the inflammation cells into interstitium. Clinically, pneumonia is defined as a lung inflammation caused by microorganism (bacteria, viral, fungal, parasites).

The inflammation of lung parenchymal initiates consolidation of lung tissues and disruption of local gas exchange. The histological experiment will find pneumonitis or inflammation reaction such as alveolitis

and also exudate aggregation which is caused by many factors and happen in various times. (Fine 1997, Niederman 2004, Soedarsono 2010). Based on Clinical epidemiology, pneumonia could be divided into : community-acquired pneumonia, hospital-acquired pneumonia, aspiration pneumonia. (PDPI 2003, Soedarsono 2010).

There are some pneumonia's high risk groups that consist of : age (infants or older than 60 years old), smoking history, immunosuppressant drug users, live in community with medical problems (for example nursing house), ventilator users, Immune deficiency diseases (example AIDS, diabetes, and kidney failure), neurology and cerebrovascular diseases, harmful contaminated air exposed (Requelme 1997, PDPI 2003, Niederman 2004). In general, CAP caused by gram-positive bacteria, The rule of antibiotics selection must be done by knowing the definitive etiology, but the severity of cases forces the early treatment of antibiotics. Because of definitive diagnostic takes too much time, Empiric based antibiotics become an option (Niederman 2004, Weiss 2005).

MATERIALS AND METHODS

This is a descriptive study which involved all of the pulmonology hospitalization patients in Dr. Zainoel Abidin Hospital Banda Aceh as a population. This study was done within period of December 1st 2010 until February 28th 2011. The samples of this study were taken from all cases of CAP in Pulmonology inpatient room of Dr. Zainoel Abidin Hospital Banda Aceh and microbiological examination had been done within the 2nd period of study. The characteristic of the patients is obtained from medical record and forms of research.

RESULT

During this research period, there are 35 CAP patients detected. They consists of 25 men and 10 women. Data analysis was performed on each variable of the result in univariate descriptive. It was found that the most common cause of CAP that requiring hospitalization is bacteria and the majority caused by *Klebsiella pneumoniae* (Table 1). Hospitalized CAP patients increased due to increase of age (Table 2). This study also revealed that from all of hospitalized CAP patients, 71.4% had an active smoking habit and 28.6% are passive smokers (Table 3).

Table 1. Frequency distribution of etiology

No	Etiology	Freq. (n)	%
1	Bacteria	30	85.7
	• <i>Klebsiella pneumoniae</i>	14	46.7
	• <i>Staphylococcus aureus</i>	6	20
	• <i>Streptococcus pneumoniae</i>	4	13.3
	• <i>Streptococcus Sp</i>	3	10
	• <i>Streptococcus ep.</i>	3	10
2	Non bacteria	5	14.3
	• Fungal	2	40
	• Unidentified	3	60

Table 2. Distribution frequency based on age, bacterial etiology.

No	Age	<i>Klebsiella pneumoniae</i>	<i>Staphylococcus aureus</i>	<i>Streptococcus pneumoniae</i>	<i>Streptococcus Sp</i>	<i>Streptococcus ep.</i>	%
1	Young adults	0	0	0	0	1	3.3
2	Middle adults	1	1	1	1	0	13.3
3	Older adults	3	3	1	2	2	36.7
4	Elderly	10	2	2	0	0	46.7
Total		14	6	4	3	3	100

Table 3. Distribution of bacterial and non bacterial etiology to history of smoking.

No	Smoking	Bacteria		Non Bacteria		Total	
		n	%	n	%	n	%
1.	Active	22	88	3	12	25	71.4
2.	Passive	8	80	2	20	10	28.6
		30	85	5	15	35	100

DISCUSSION

About 85 % of CAP caused by bacteria, from this 30 bacterial CAP cases, there are consists of : *Klebsiella pneumoniae* 14 cases (46,7%), *Staphylococcus aureus* 6 cases (20 %), *Streptococcus pneumoniae* 4 cases (13,3%), *Streptococcus Sp* 3 cases (10%), and *Streptococcus epidermidis* 3 cases (10%). From all of the 5 non-bacterial pneumonia patients there are two fungal infections and three are unidentified. Etiology of CAP in this study shows similarity results with study in other places within last 5 years in Indonesia (Medan, Jakarta, Surabaya, Malang and Makasar) which is the most common causes are : *Klebsiella pneumoniae* (45.18 %) and *Streptococcus pneumoniae* (20 %) (Soedarsono 2010).

The age of CAP patients that hospitalized in pulmonology inpatient room of Dr. Zainoel Abidin Hospital Banda Aceh divided into : young adults (> 18-24 years old), middle adults (25-44 years old), older adults (45-64 years old), elderly (> 64 years old). the research shows, the middle adults patients are about (17.1 %), older adults (40 %), elderly 15 patients (42.9 %). From table 2, the amount of CAP cases that caused by bacteria in middle adults are about 13.3 %, older adults are about 36.7 % and elderly are about 46.7 %. The risk of CAP in this research is increase as increasing of the age. The death that caused by pneumonia in elderly close to 200 per 100.000 cases, with the risk of CAP in > 65 years old is 6 times higher than <60 years old. Commonly in geriatric, pneumonia is the fifth leading cause of death. (Requelme 1997, Zalacin 2003, Soedarsono 2010, Prasenohadi 2010)

In elderly people, 18 – 30 % etiology of CAP are caused by *Streptococcus pneumoniae*, followed by *Haemophilus influenzae*, *negative gram*, *anaerob* and viral. They also acts as modifying factors of penicillin resistant *Streptococcus pneumoniae*. For the elderly who live in certain community, the common etiology of pneumonia is caused by pneumococci, besides negative gram, *Staphylococcus aureus* and *Haemophilus influenzae*. (PDPI 2003, Niederman 2004, Marrie 2004, Weiss 2005). By increasing of the age, the risk of CAP requiring hospitalization is also increase , this study found bacterial CAP infected the elder 46.7 %. The

leading cause of CAP in elder of this study are *Klebsiella pneumoniae* (30 %), *Staphylococcus aureus* (6.6 %), and *Streptococcus pneumoniae* (6.6 %).

In the CAP smoker patients found that 80 – 88 % of the disease caused by bacteria, in this study determine the active smokers is 71.4 % and the passive smokers 28.6 %. Metabolites of cigarette and its derivatives that inhaled while smoking is one of the factors that directly or indirectly damage of lower respiratory tract. The smoke of cigarette consists of sidestream and exhaled mainstream that causes damage and impaire of vibrating bristles activities of respiratory system that make mokusilier transport disorder and macrophage dysfunction. On the other hand, the exposure to cigarette's smoke through the mechanism of stress oxidative and Reactive Oxygen Species (ROS) can lead the cells and the lower respiratory tract tissues damage. Finally, it decrease the ability of lower respiratory tract to defense against the respiratory pathogens.

CONCLUSION

It is considered that the CAP patients whose hospitalized in Pulmonology inpatient room of Dr. Zainoel Abidin Hospital Banda Aceh within period December 1st 2010 till February 28th 2011 were caused by bacterial 85.7 %. The most common bacteria is *Klebsiella pneumoniae* (46.7 %). Age and smoke habit could increase the incident of CAP.

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