INFECTION OF EXTENDED SPECTRUM BETA-LACTAMASE PRODUCING ENTEROBACTERIACEAE AND ITS ASSOCIATION WITH ANTIBIOTIC USE IN PATIENTS OF CENTRAL ICU “RUMAH SAKIT CIPTO MANGUNKUSUMO” IN 2011

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Introduction

Extended-spectrum beta-lactamase (ESBL) producing Enterobacteriaceae is one of the bacterial groups which has the resistance toward beta-lactam antibiotics such as cephalosporins and monobactams. The prevalence of ESBL-producing Enterobacteriaceae has been increasing worldwide. In 2005, the prevalence of ESBL producing bacteria in Harapan Kita Hospital, Indonesia was 16%.

This microorganism prevalence varies among hospitals, and which its resistance could complicate the treatment, extend hospital length of stay, and increase the mortality. One of the factors that could increase the incidence of ESBL producing Enterobacteriaceae infection is irrational antibiotics use. The antibiotic use profile was best measured in the Intensive Care Unit (ICU) since the antibiotic pressure was high.

Therefore, the prevalence of ESBL producing Enterobacteriaceae infection and its association with antibiotic use in the ICU are important for the health professionals to enhance the infection control strategies in the hospital.

Aim

The aim of this study is to determine the prevalence of ESBL-producing Enterobacteriaceae and its association with antibiotic use.

Method

Results and Discussion

Table 1. Distribution of Demographic Characteristics

Variable (n=111)	Frequency	Percentage
Age		
<10 years old	2	1,8%
10-49 years old	66	59,4%
> 49 years old	43	38,7%
Gender		
Male	56	50,5%
Female	55	49,5%

Figure 1. ESBL Resistance Test Result in ICU Patients with Positive and Negative Antibiotic Use

From 111 samples of this study, the demographic characteristics based on gender was evenly distributed. The mean age of participants in antibiotic groups and non-antibiotic groups was 43.4 and 53.7, consecutively. The analysis showed that the prevalence of ESBL producing Enterobacteriaceae in ICU patients of Cipto Mangunkusumo Hospital in 2011 was 7.2% and the antibiotic use was not significantly different with the infection of ESBL producing Enterobacteriaceae, statistically ($p=1.00$; CI95% 1.039-1.179).

Compared to the previous similar study in Harapan Kita Hospital in 2005, the prevalence of ESBL producing Enterobacteriaceae was decreased from 16% to 7.2%. Duration of antibiotic use, history of antibiotic use before admission in ICU, and antibiotic types are factors that was not included in the study but could affect the results. A study by Pajariu et al in 2010, which used 104 samples, showed that infection of ESBL producing organisms was not significantly different to the use of antibiotics in general ($p>0.05$) but related to the use of ampicillin and gentamicin with a statistically significant difference ($p<0.005$).

Conclusion

- The prevalence of ESBL producing Enterobacteriaceae infection in Central ICU Cipto Mangunkusumo Hospital in 2011 was 7,2%.
- Antibiotic use was not related to the prevalence of ESBL producing Enterobacteriaceae infection ($p=1.00$; CI95% 1.039-1.179).
- Patients with positive and negative antibiotic use, have the same risk to be infected by ESBL producing Enterobacteriaceae.

Suggestions

- Education about rational antibiotic use is needed for infection prevention and control by health professionals in the hospital.
- Further studies is needed about this subject, therefore health professionals would know more about the correlation between ESBL producing Enterobacteriaceae infection and its risk factors.

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