

**ANALISIS KOMUNITAS SERTA POTENSI RESISTENSI ANTIBIOTIK
BAKTERI DI LINGKUNGAN RUMAH SAKIT X KOTA BANDUNG**

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2019

ABSTRACT

STUDIES ON BACTERIAL COMMUNITY AND ANTIBIOTIC RESISTANCE OF BACTERIA AT X HOSPITAL IN BANDUNG

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Hospital is a place with a high concentration of bacteria which can cause nosocomial infections. Bacteria in the hospital can spread in the air and last for a certain time. Studies found an increase in the number of bacteria resistant to antibiotics due to high antibiotic exposure. This research was conducted to determine the abundance and types of bacteria present in the air outside the hospital and the potential resistant to certain antibiotics. Bioaerosol samples were taken from three different heights (1,5 m, 24,5 m, and 93,4 m) in the morning (07.00-11.00 WIB) and night (19.00-23.00 WIB) for 4 hours using a membrane filter with 0.45 microns pore. Isolation and enumeration of bacteria were carried out by inoculating the sample in PBS solution to agar media plates which are Nutrient Agar (NA), Trypticase Soy Agar (TSA), and Luria Bertani Agar (LB) with the spread method and incubated at 37°C for 24 hours. Purification of the bacteria produced 13 selected colonies which were then identified with a molecular method using 16S rRNA markers. Antibiotic resistance test was performed on 6 selected isolates and used ampicillin, amoxicillin, ciprofloxacin, and chloramphenicol in minimum inhibitory concentration (MIC). Endotoxin concentrations were measured using Pierce™ LAL Chromogenic Endotoxin Quantitation Kit. The results showed that the abundance of bacteria at 1,5 m in the morning in NA is $6,3 \times 10^3$ CFU/m³, LB is $1,13 \times 10^4$ CFU/m³, and TSA is $1,053 \times 10^4$ CFU/m³, 1,5 m at night in TSA is $2,25 \times 10^2$ CFU/m³, and 24,5 m at night in TSA is $2,415 \times 10^3$ CFU/m³. 52 types of colonies were found and 13 dominant colonies were identified using 16S rRNA. It is found that 12 isolates are related to genus Bacillus and one isolate is related to genus Staphylococcus. Antibiotic resistance tests showed that 5 isolates related to the genus Bacillus had potential resistance to ampicillin and amoxicillin and one isolate related to genus Staphylococcus had potential resistance to chloramphenicol and ciprofloxacin at minimum inhibitory concentrations. Endotoxin concentration at 1,5 m in the morning is 0,27 EU/m³ and at night is 0,44 EU/m³, at 24,5 m in the morning is 0,35 EU/m³ and at night is 0,56 EU/m³, and at 93,5 m in the morning is 0,4 EU/m³ and at night it is 0,95 EU/m³. The number of bacteria and endotoxin levels in the air at hospital X is far below the threshold. Genus Bacillus dominate the air environment at hospital X. However, it was found bacterial isolates are resistant to antibiotics which are often used in hospitals. These bacteria are resistant to more than one

antibiotic and classified as multidrug-resistant bacteria. Although the abundance of bacteria and endotoxin concentrations are within safe limits, the discovery of bacteria that are resistant to antibiotics can increase the potential risk of bioaerosol.

Keywords: *Abundance, air, bioaerosol, hospital, resistance.*