ABSTRACT

EFFECT OF ETHANOL EXTRACT ALOE VERA (*Aloe vera*) LEAVES AGAINST *Escherichia coli* ESBL AND *Klebsiella pneumoniae* ESBL

Dewinta Enggar Pramesthi. Yuani Setiawati. Eko Budi Koendhori.
Fakultas Kedokteran Universitas Airlangga

Introduction: Lately, herbal medicine become more popular for treatment. This phenomena could be happen because of its minimum cost and relative easy to use. Aloe vera as one of herbal could be easily found in Indonesia. Some active substances have been proven found in aloe vera. These active substances have antibacterial effect for some bacterias. There are many infections caused by gram negative bacterias. Some of gram negative bacterias produce mutant β lactamase enzyme, that make this bacteria resistant to antibiotic. These bacterias are known as Extended Spectrum Beta Lactamase (ESBL) bacteria. ESBL bacteria are resistant to some antibiotics in beta lactam class. ESBL bacteria infections become one of main problem in hospital. Based on this background, the aim of this study was to investigate the antibacterial activity of aloe vera leaves ethanol extract between *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL.

Methods: This study was a lab experimental. Aloe vera leaves ethanol extract, *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL were used on this study. Aloe vera leaves ethanol extract was from Balai Materia Medika Batu, *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL were from Microbiology Laboratory Faculty of Medicine Airlangga University. Minimum Inhibitory Concentration (MIC) values and Minimum Bactericidal Concentration (MBC) values were determined by dilution method. The concentration used in MIC determination for both bacteria is 90%; 80%; 70%; 60%; 50%; 40%; 30%; and 20%. The MBC values were determined by suspension streaking from muller hinton broth on nutrient agar plate. The result is analyzed with description method.

Results: The MIC value for *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL is found in the same concentration which is 80% (8 g/ml). These MIC values determined by extract concentration inside the tube that turns from turbid into clear suspension. The MBC values for *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL also found in the same concentration 80% (8 g/ml). These MBC values determined by bacteria colonies absence in nutrient agar plate after streaking. MIC and MBC values have been proved in the first until tenth replications. Thus, aloe vera leaves ethanol extract has no different effectiveness against *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL.

Conclusion: Aloe vera leaves ethanol extract has antibacterial effect against *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL. There is no different effectiveness from the extract for both bacterias. The MIC for *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL is 80% (8 g/ml), and the MBC for *Escherichia coli* ESBL and *Klebsiella pneumoniae* ESBL is 80% (8 g/ml).

Keywords: *Escherichia coli* ESBL - *Klebsiella pneumoniae* ESBL - *Aloe vera leaves* - antibacterial - enzyme producer - dilution method