The Effectiveness of Lysozyme in Decreasing the Minimum Inhibitory Concentration against Amoxicillin-Resistant *Streptococcus pneumoniae*

Efektifitas Lisozim pada Penurunan Kadar Hambat Minimum Amoksisillin terhadap *Streptococcus pneumoniae* Resisten Amoksisillin

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**Background:** *Streptococcus pneumoniae* is a gram-positive bacterium that causes various types of respiratory diseases such as pneumonia, sinusitis, otitis, bronchitis and meningitis. Amoxicillin is a class of penicillin β-lactam antibiotic which works to inhibit cell wall synthesis of gram-positive bacteria such as *Streptococcus pneumoniae*. Lysozyme is an enzyme that has a role in killing gram-positive bacteria by lyses the peptidoglycan cell wall.

**Research Aims:** To determine the effectiveness of lysozyme in reducing Amoxicillin minimal inhibitory levels against the bacteria *Streptococcus pneumoniae*.

**Research Method:** This research is experimental laboratory. Materials used include: Local *Streptococcus pneumoniae* strains, Amoxicillin, lysozyme (sigma), Tryptone Soya Agar (TSA) and Brain Heart Infusion (BHI) media. Determination of the combination of minimal lysozyme and Amoxicillin combination with a liquid dilution series method (tube dilution series).

**Research Results:** Based on the KHM examination with the dilution method, the following results are obtained: KHM lysozyme against *Streptococcus pneumonia* > 300 µg / ml, MIC Amoxicillin against *Streptococcus pneumoniae* 166.67 µg / ml, and a combination of lysozyme and Amoxicillin against *Streptococcus pneumoniae* 12.34 µg / ml. The results of data analysis using One Way Anova were obtained p <0.05 for MIC combination of lysozyme and Amoxicillin. This proves that the addition of lysozyme can reduce the rate of MIC in Amoxicillin against Amoxicillin-resistant *Streptococcus pneumoniae*.

**Conclusion:** Lysozyme with levels of 300 µg / ml does not have an antibacterial effect on Amoxicillin-resistant *Streptococcus pneumoniae*. The combination of lysozyme and Amoxicillin was able to reduce Amoxicillin minimal inhibitory concentration against Amoxicillin-resistant *Streptococcus pneumoniae*.

**Key words:** Amoxicillin, Lysozyme, *Streptococcus pneumoniae* Resistant to Amoxicillin, Minimum Inhibitory Level.