

HUBUNGAN ANTARA KEMAMPUAN PEMBENTUKAN BIOFILM DENGAN RESISTENSI ANTIBIOTIK PADA BAKTERI PATOGEN DARI PASIEN INFEKSI PARU BAKTERIAL DI RSUD BANYUMAS

ABSTRAK

Latar Belakang: Bakteri penghasil biofilm menjadi tantangan klinis utama pada infeksi paru bakterial karena dapat meningkatkan resistensi antibiotik hingga 1000 kali lipat. Penelitian berkaitan resistensi antibiotik pada infeksi paru bakterial akibat pembentukan biofilm di RSUD Banyumas sebelumnya belum pernah dilakukan. **Tujuan:** Menganalisis hubungan antara kemampuan pembentukan biofilm dengan resistensi antibiotik dari pasien infeksi paru bakterial di RSUD Banyumas. **Metodologi:** Penelitian menggunakan *microtiter plate biofilm assay* dan kultur serta AST dengan menggunakan alat otomatis, Vitek 2 Compact. **Hasil:** Responden penelitian berjumlah 90 dengan distribusi didominasi bakteri Gram negatif 88,9%, serta proporsi kemampuan pembentukan biofilm lemah terbanyak 81%. Bakteri Gram negatif terbanyak adalah *Klebsiella pneumoniae*, sedangkan Gram positif terbanyak adalah *Staphylococcus aureus*. Uji korelasi Spearman pembentukan biofilm terhadap antibiotik Aztreonam ($p = 0,041$) dan Ceftriaxone ($p = 0,036$) memperoleh nilai $p\text{-value} < 0,05$. **Kesimpulan:** Terdapat hubungan signifikan kemampuan pembentukan biofilm pada bakteri gram negatif dengan kategori MIC pada Aztreonam dan Ceftriaxone serta terdapat hubungan signifikan profil resistensi antibiotik terhadap klasifikasi jenis bakteri.

Kata Kunci: Infeksi Paru Bakterial, Resistensi antibiotik, Biofilm, Banyumas

THE ASSOCIATION BETWEEN BIOFILM-FORMING ABILITY AND ANTIBIOTIC RESISTANCE IN PATHOGENIC BACTERIA ISOLATED FROM PATIENTS WITH BACTERIAL PULMONARY INFECTIONS AT RSUD BANYUMAS

ABSTRACT

Background: Biofilm-producing bacteria present a major clinical challenge in bacterial pneumonia because they can markedly increase antibiotic resistance, up to 1,000-fold. Research on antibiotic resistance in relation to biofilm formation in bacterial pulmonary infections at RSUD Banyumas has not been previously conducted. **Objective:** To analyze the association between biofilm-forming ability and antibiotic resistance in bacterial isolates from patients with bacterial pulmonary infections at RSUD Banyumas. **Methods:** Biofilm formation was assessed using the microtiter plate biofilm assay, while antibiotic susceptibility testing (AST) was conducted using the automated Vitek-2 Compact system. **Result:** The study included 90 isolates, dominated by Gram-negative bacteria (88.9%). Weak biofilm-forming ability was most common (81%). The most prevalent Gram-negative bacterium was *Klebsiella pneumoniae*, and the most common Gram-positive bacterium was *Staphylococcus aureus*. Spearman correlation showed a significant association between biofilm formation and resistance to Aztreonam ($p = 0.041$) and Ceftriaxone ($p = 0.036$), with $p < 0.05$. **Conclusion:** There is a significant relationship between the ability to form biofilms in gram-negative bacteria and the MIC category of Aztreonam and Ceftriaxone, and there is a significant relationship between the antibiotic resistance profile and the classification of bacterial types.

Keywords: Bacterial lung Infection, Antibiotic Resistance, Biofilm, Banyumas