

ABSTRAK

Escherichia coli merupakan bakteri penyebab ISK dan kasus resistensi. *Escherichia coli* resisten dikarenakan memproduksi enzim *Extended-Spectrum β -lactamase* (ESBL) dan membentuk biofilm. Strain *Escherichia coli* memiliki beberapa faktor virulensi yang terlibat dalam pembentukan biofilm seperti *fimbriae* tipe 1 (*fimA*) dan *P-fimbriae* (*papC*). Tujuan penelitian untuk mengetahui hubungan antara produksi ESBL dengan pembentukan biofilm dan gen faktor virulensi pada bakteri *E. coli*. Penelitian ini menggunakan observasional analitik *cross sectional*. Teknik pengumpulan data dilakukan dengan pengambilan sampel urin. Isolasi, identifikasi dan uji resistensi ESBL menggunakan metode Chrome Agar ESBL. Identifikasi Biofilm menggunakan *Microtiter Plate Assay*. Identifikasi gen *fimA* dan *papC* menggunakan metode PCR. Hasil penelitian diperoleh *Escherichia coli* ESBL 59%. *Escherichia coli* ESBL kategori non biofilm 60%, *Escherichia coli* ESBL kategori biofilm lemah 40%. Hasil PCR gen *fimA* 100% positif, gen *papC* 75% positif dan 25% negatif. Nilai Sig 0,014 < 0,05 untuk persentase kejadian antara *Escherichia coli* penghasil ESBL dengan *Escherichia coli* pembentuk biofilm. Nilai $p > 0,05$ untuk hubungan antara resistensi *Escherichia coli* penghasil ESBL dengan pembentukan biofilm. Nilai Sig 1,000 > 0,05 dan Sig 0,317 > 0,05 untuk perbandingan positività hasil pemeriksaan biofilm metode *Microtiter Plate Biofilm Assay* dengan hasil pemeriksaan PCR gen *fimA*, dan gen *papC*. Kesimpulan dari penelitian ini yaitu Ada perbedaan persentase kejadian antara *Escherichia coli* penghasil ESBL dengan *Escherichia coli* pembentuk biofilm pada ruang rawat inap di RS Wiradadi Husada Purwokerto. Tidak ada hubungan antara *Escherichia coli* penghasil ESBL dengan *Escherichia coli* pembentuk biofilm. Hasil positività pemeriksaan biofilm *Escherichia coli* penghasil ESBL metode *Microtiter Plate Biofilm Assay* sebanding dengan hasil positività gen *fimA*, dan gen *papC* pada pemeriksaan PCR

Kata kunci: *Escherichia coli*, ESBL, Biofilm, *fimA*, *papC*

ABSTRACT

Escherichia coli is the bacteria that causes UTIs and cases of resistance. *Escherichia coli* is resistant because it produces the Extended-Spectrum-lactamase (ESBL) enzyme and forms a biofilm. *Escherichia coli* strains have several virulence factors involved in biofilm formation such as fimbriae type 1 (*fimA*), and P-fimbriae (*papC*). The purpose of this study was to determine the relationship between ESBL production and biofilm formation and virulence factor genes in *E.coli* bacteria. This study uses cross-sectional analytical observational. The data collection technique was done by taking a urine sample. Isolation, identification, and testing of ESBL resistance using the ESBL Chrome Agar method. Biofilm identification using Microtiter Plate Assay. Identification of *fimA* and *papC* genes using PCR method. The results showed that *Escherichia coli* ESBL 59%. *Escherichia coli* ESBL in the non-biofilm category 60%, *Escherichia coli* ESBL in the weak biofilm category 40%. The PCR results for the *fimA* gene were 100% positive, the *papC* gene was 75% positive and 25% negative. Sig $0.014 < 0.05$ for the percentage of occurrence between ESBL-producing *Escherichia coli* and biofilm-forming *Escherichia coli*. $P > 0.05$ for the relationship between resistance to ESBL-producing *Escherichia coli* and biofilm formation. Sig $1,000 > 0.05$ and Sig $0.317 > 0.05$ were used to compare the positivity of the microtiter plate biofilm examination results and the results of the *fimA* and *papC* gene PCR examinations. This study concluded that there was a difference in the percentage of occurrence between *Escherichia coli* producing ESBL and *Escherichia coli* forming biofilm in the inpatient ward of Wiradadi Husada Hospital, Purwokerto. There was no relationship between ESBL-producing *Escherichia coli* and biofilm-forming *Escherichia coli*. The positive results of ESBL-producing *Escherichia coli* biofilm examination using the Microtiter Plate Biofilm Assay method were comparable to the positive results of the *fimA* gene and the *papC* gene on PCR examination.

Keywords: *Escherichia coli*, ESBL, Biofilm, *fimA*, *papC*