

INTISARI

Latar belakang: *Quinolone* merupakan antibiotik sintesis yang penggunaannya luas. Prevalensi *Enterobacteriaceae* yang resisten terhadap antibiotik *Quinolone* dilaporkan cukup tinggi, berkisar 18-55%. *Enterobacteriaceae* penghasil AmpC β -laktamase merupakan salah satu kuman penting yang berperan dalam penyebaran resistensi antibiotik multiobat karena memiliki plasmid yang dapat menyebarkan ke kuman lainnya. Penyebaran resistensi antibiotik *Quinolone* juga dilaporkan dapat melalui plasmid, yakni melalui gen *plasmid mediated quinolone resistance* (PMQR). *Enterobacteriaceae* penghasil *extended spectrum beta lactamase* (ESBL) dilaporkan memiliki hubungan dengan penyebaran gen PMQR. Penelitian tentang hubungan resistensi antibiotik *Quinolone* pada *Enterobacteriaceae* penghasil AmpC β -laktamase belum banyak dilaporkan.

Tujuan: Mengevaluasi tingkat resistensi isolat klinis *Enterobacteriaceae* penghasil AmpC β -laktamase terhadap antibiotik *Quinolone*.

Metode: Penelitian ini merupakan studi observasional potong lintang di RSUP Dr. Sardjito dengan subjek penelitian adalah isolat klinis *Enterobacteriaceae* (*E. coli*, *K. pneumoniae*, dan *P. mirabilis*) berdasarkan hasil kultur identifikasi alat Vitek 2 Compact. Isolat klinis diuji dengan *AmpC disc test* menggunakan larutan *phenylboronic acid* (PBA) untuk mengidentifikasi kemampuannya menghasilkan AmpC β -laktamase dan akan dikelompokkan menjadi dua kelompok. Uji kepekaan antibiotik *quinolone* dilakukan dengan metode *microdilution broth otomatis* dengan Vitek 2 Compact. Uji proporsi dua populasi dilakukan untuk menilai perbedaan tingkat resistensi *quinolone* di antara kedua kelompok. Uji variabel kategorik menggunakan uji *Chi-Square* dan *Fisher Exact test* dengan batas kemaknaan $p < 0,05$. Deskripsi proporsi dengan interval kepercayaan 95%. Sampel diambil secara *consecutive sampling* hingga jumlah sampel minimal terpenuhi. Analisis hasil menggunakan perangkat lunak SPSS versi 27 (SPSS Inc., Chicago, IL, USA).

Hasil: Sebanyak 109 isolat klinis terkumpul pada penelitian ini, 43,12% penghasil AmpC β -laktamase dan 56,88% bukan penghasil AmpC β -laktamase. Tingkat resistensi *Enterobacteriaceae* terhadap *quinolone* sebesar 74,3%. *Enterobacteriaceae* penghasil AmpC β -laktamase memiliki tingkat resistensi terhadap *quinolone* sebesar 89,36%, lebih tinggi dibanding bukan penghasil AmpC β -laktamase sebesar 62,90% ($p=0,002$).

Simpulan: *Enterobacteriaceae* penghasil AmpC β -laktamase memiliki tingkat resistensi terhadap *quinolone* secara signifikan lebih tinggi dibandingkan bukan penghasil AmpC β -laktamase.

Kata kunci: *Enterobacteriaceae*, AmpC β -laktamase, resisten *quinolone*, PMQR

ABSTRACT

Background: Quinolone is a widely used synthetic antibiotic. The prevalence of *Enterobacteriaceae* resistant to quinolone is reported to be quite high, ranging from 18-55%. AmpC β -lactamase-producing *Enterobacteriaceae* are one of the important germs that play a role in the spread of multidrug resistance because they have plasmids that can spread to other germs. The spread of quinolone resistance is also reported to be through plasmids, namely through the plasmid mediated quinolone resistance (PMQR) gene. *Enterobacteriaceae* producing extended spectrum beta lactamase (ESBL) is reported to have an association with the spread of PMQR genes. Research on the relationship of quinolone resistance in AmpC β -lactamase-producing *Enterobacteriaceae* has not been widely reported.

Objective: To evaluate the resistance rates of AmpC β -lactamase-producing *Enterobacteriaceae* to quinolone

Methods: This study is a cross-sectional observational study at Dr. Sardjito General Hospital with the research subjects being clinical isolates of *Enterobacteriaceae* (*E. coli*, *K. pneumoniae*, and *P. mirabilis*) based on the results of Vitek 2 Compact culture identification. Clinical isolates were tested with the AmpC disc test using phenylboronic acid (PBA) solution to identify their ability to produce AmpC β -lactamase and were grouped into two groups. Quinolone antibiotic susceptibility testing was performed using the automatic microdilution broth method with Vitek 2 Compact. A two-population proportion test was performed to assess the difference in quinolone resistance rates between the two groups. Categorical variables were tested using the Chi-Square test and Fisher's Exact test with a significance level of $p < 0.05$. Proportions were described with 95% confidence intervals. Samples were taken using consecutive sampling until the minimum sample size was met. The results were analysed using SPSS software version 27 (SPSS Inc., Chicago, IL, USA).

Result: A total of 109 clinical isolates were collected in this study, 43.12% of which produced AmpC β -lactamase and 56.88% did not produce AmpC β -lactamase. The resistance rate of *Enterobacteriaceae* to quinolones was 74.3%. *Enterobacteriaceae* producing AmpC β -lactamase had a resistance rate to quinolones of 89.36%, which was higher than that of non-AmpC β -lactamase producers at 62.90% ($p = 0.002$).

Conclusion: AmpC β -lactamase-producing *Enterobacteriaceae* have significantly higher quinolone resistance rates than non-AmpC β -lactamase-producing clinical isolates.

Keywords: *Enterobacteriaceae*, AmpC β -lactamase, Quinolone resistance, PMQR