

ABSTRAK

KOMPARASI TIGA MODIFIKASI UJI FENOTIPIK *CARBAPENEM INACTIVATION METHOD* (mCIM, sCIM DAN rCIM) DALAM DETEKSI BAKTERI GRAM NEGATIF PENGHASIL KARBAPENEMASE

Siti Rochmanah Oktaviani Sulikah

Latar belakang: Ancaman CP-CRE semakin dikenal selama beberapa tahun terakhir, sedangkan ancaman oleh CP-GNB *non-glucose-fermenter* masih kurang diperhatikan. *Carbapenem Inactivation Method* (CIM) dan modifikasinya dilaporkan efektif dalam mendeteksi berbagai karbapenemase. **Tujuan Penelitian:** Menentukan perbedaan sensitivitas dan spesifisitas diantara tiga modifikasi uji fenotipik *Carbapenem Inactivation Method* (mCIM, sCIM dan rCIM) dalam mendeteksi bakteri Gram negatif penghasil karbapenemase. **Metode Penelitian:** Desain penelitian ini adalah studi analitik observasional dengan pendekatan *cross sectional*. Isolat diuji menggunakan prosedur mCIM, sCIM dan rCIM. Karakterisasi genotipik menggunakan PCR digunakan sebagai *gold standard*. Sensitivitas dan spesifisitas masing-masing prosedur kemudian dibandingkan. **Hasil Penelitian:** Sebanyak 38 isolat CRE, 23 isolat CRPA dan 32 isolat CRAB dari spesimen urin menurut sistem semi-otomatis BD Phoenix™ atau Vitek2 system dari penelitian sebelumnya oleh Prof. Kuntaman dkk. tahun 2015-2016 diperiksa dalam penelitian ini. Didapatkan sensitivitas dan spesifisitas mCIM sebesar 44% dan 92,3% untuk CP-CRE ($p=0,022$), 85,7% dan 43,8% untuk CP-CRPA ($p=0,172$), 81% dan 18,2% untuk CP-CRAB ($p=0,952$) serta 64,2% dan 52,5% untuk CP-GNB ($p=0,108$). Sensitivitas dan spesifisitas sCIM sebesar 48% dan 76,9% untuk CP-CRE ($p=0,136$), 100% dan 43,8% untuk CP-CRPA ($p=0,036$), 81% dan 9,1% untuk CP-CRAB ($p=0,461$) serta 67,9% dan 45% untuk CP-GNB ($p=0,203$). Sedangkan sensitivitas dan spesifisitas rCIM sebesar 44% dan 92,3% untuk CP-CRE ($p=0,022$), 71,4% dan 43,8% untuk CP-CRPA ($p=0,493$), 81% dan 45,5% untuk CP-CRAB ($p=0,115$) serta 62,3% dan 60% untuk CP-GNB ($p=0,033$). **Kesimpulan:** Untuk deteksi keseluruhan isolat CP-GNB maupun CP-CRE dan CP-CRPA, sensitivitas sCIM lebih tinggi dibandingkan mCIM dan rCIM namun mempunyai spesifisitas yang lebih rendah. Sedangkan untuk CP-CRAB didapatkan sensitivitas yang sama pada mCIM, sCIM dan rCIM namun dengan spesifisitas lebih rendah pada sCIM.

Kata kunci: Karbapenemase, bakteri Gram negatif, mCIM, sCIM, rCIM

ABSTRACT**COMPARISON OF THREE MODIFICATIONS PHENOTYPIC TEST OF THE CARBAPENEM INACTIVATION METHOD (mCIM, sCIM AND rCIM) IN DETECTION OF CARBAPENEMASE-PRODUCING GRAM NEGATIVE BACTERIA**

Siti Rochmanah Oktaviani Sulikah

Background: The threat of CP-CRE has been increasingly in recent years, while the threat of non-glucose-fermenter CP-GNB is less attention. The accurate detection and characterization of CP-GNB can inform important steps in preventing infection for epidemiological purposes and preventing cross-transmission to other patients. Carbapenem Inactivation Method (CIM) and its modification are reported to be effective in detecting various carbapenemases. **Objective:** To determine the differences in sensitivity and specificity among the three modified phenotypic tests of the Carbapenem Inactivation Method (mCIM, sCIM and rCIM) in detection of carbapenemase-producing Gram-negative bacteria. **Methods:** The design of this study was an observational analytic study with a cross sectional approach. The isolates were tested using the mCIM, sCIM and rCIM procedures. The gold standard was genotypic characterisation by PCR. The sensitivity and specificity of each procedure were then compared. **Results:** A total of 38 CRE isolates, 23 CRPA isolates and 32 CRAB isolates from urine according to the semi-automatic BD Phoenix system or Vitek2 system from previous study by Prof. Kuntaman et al. in 2015-2016 were included in this study. The sensitivity and specificity of mCIM were 44% and 92.3% for CP-CRE ($p=0.022$), 85.7% and 43.8% for CP-CRPA ($p=0.172$), 81% and 18.2% for CP-CRAB ($p=0.952$) and 64.2% and 52.5% for CP-GNB ($p=0.108$). The sensitivity and specificity of sCIM were 48% and 76.9% for CP-CRE ($p=0.136$), 100% and 43.8% for CP-CRPA ($p=0.036$), 81% and 9.1% for CP-CRAB ($p=0.461$) and 67.9% and 45% for CP-GNB ($p=0.203$). While the sensitivity and specificity of rCIM were 44% and 92.3% for CP-CRE ($p=0.022$), 71.4% and 43.8% for CP-CRPA ($p=0.493$), 81% and 45.5% for CP-CRAB ($p=0.115$) and 62.3% and 60% for CP-GNB ($p=0.033$). **Conclusion:** For the overall detection of CP-GNB, CP-CRE and CP-CRPA, the sensitivity of sCIM was higher than that of mCIM and rCIM but has lower specificity. Whereas CP-CRAB has the same sensitivity in mCIM, sCIM and rCIM but with lower specificity in sCIM.

Keywords: Carbapenemase, Gram-negative bacteria, mCIM, sCIM, rCIM