

# Evaluasi kadar dan faktor-faktor yang memengaruhi farmakokinetik vankomisin pada pasien sakit kritis = Evaluation of vancomycin concentration and factors affecting its pharmacokinetics in critically ill patients

Mario Abet Nego, author

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## Abstrak

**Pendahuluan:** Berbagai studi menyatakan bahwa pencapaian kadar terapeutik vankomisin pada pasien sakit kritis sangat rendah. Hal ini terjadi karena perubahan farmakokinetik pada pasien kritis akibat proses penyakit dan berbagai intervensi medis. Vankomisin mempunyai indeks terapeutik yang sempit, oleh karena itu pencapaian target kadar terapeutik sangat penting dievaluasi. Saat ini, pemberian vankomisin pada pasien sakit kritis di Rumah Sakit Cipto Mangunkusumo, Jakarta, Indonesia berdasarkan pedoman penggunaan antibiotik tahun 2022. Namun, evaluasi pencapaian target kadar terapeutik vankomisin pada pasien kritis belum pernah dilakukan. Evaluasi pencapaian target kadar terapeutik vankomisin ini dapat menjadi bahan pertimbangan untuk membuat pedoman pemberian dosis vankomisin yang lebih adekuat. Penelitian ini bertujuan untuk mengetahui gambaran pencapaian kadar terapeutik vankomisin pada pasien sakit kritis.

**Metode:** Penelitian ini merupakan studi pendahuluan dengan desain potong lintang. Rekrutmen subjek penelitian dilakukan dengan metode consecutive sampling. Subjek penelitian adalah pasien sakit kritis yang menggunakan vankomisin. Pemeriksaan kadar vankomisin dilakukan dengan metode ELISA pada sampel darah subjek yang diambil saat trough concentration. Data-data klinis dan laboratorium lain didapatkan dari rekam medis subjek. **Hasil:** Jumlah subjek penelitian ini adalah 20 orang. Target kadar terapeutik vankomisin tercapai pada 45% subyek penelitian. Median kadar vankomisin pada penelitian ini adalah 17,43 mg/L (3,07 – 25,11 mg/L). Kadar terapeutik vankomisin lebih banyak tercapai pada subyek yang tidak mengalami overload cairan (61,5%) dan yang mendapat vankomisin dengan cara infus yang diperpanjang (64,3%). Pada penelitian didapatkan 3 (15,8%) subyek mengalami cedera ginjal akut setelah penggunaan vankomisin, dengan kadar vankomisin 17,37 mg/L, 11,16 mg/L, dan 13,64 mg/L. **Kesimpulan:** Capaian target kadar terapeutik vankomisin terjadi hanya pada sebagian pasien sakit kritis. Keadaan subyek yang tidak overload cairan dan pemberian infus vankomisin yang diperpanjang menjadi faktor yang mungkin mempengaruhi tercapainya target kadar terapeutik vankomisin. **Kata kunci:** trough concentration, vankomisin, pasien sakit kritis, farmakokinetik, kadar terapeutik

.....**Introduction:** Various studies have stated that the achievement of vancomycin therapeutic levels in critically ill patients is very low. This condition occurs because of pharmacokinetic changes in critically ill patients due to the disease process and various medical interventions. Vancomycin has a narrow therapeutic index, therefore it is important to evaluate the drug concentration. Currently, the administration of vancomycin in critically ill patients at Cipto Mangunkusumo Hospital, Jakarta, Indonesia is based on local antibiotic guidelines 2022. However, an evaluation of vancomycin concentration in critically ill patients has never been carried out. Evaluation of vancomycin concentration can be considered as a basis for making adequate vancomycin dosing guidelines. Aim of this study was to describe the vancomycin concentration in critically ill patients. **Methods:** This research is a preliminary study with a cross-sectional design. Subjects recruitment was done by consecutive sampling method. Subjects were critically ill patients who taking

vancomycin. Examination of vancomycin concentration was conducted using ELISA method on subjects' blood samples taken during trough concentration. Other clinical and laboratory data were obtained from the subject's medical record. Result: Sample size of this study was 20 subjects. The target therapeutic level of vancomycin was achieved in 45% of the study subjects. The median of vancomycin concentration on this study was 17.43 mg/L (3.07 – 25.11 mg/L). Therapeutic levels of vancomycin were achieved more in subjects who did not experience fluid overload (61.5%) and received vancomycin by extended infusion method (64.3%). There were 3 subjects (15.8%) experienced acute kidney injury after using vancomycin, with vancomycin concentration of 17.37 mg/L, 11.16 mg/L, and 13.64 mg/L. Conclusion: Achievement of target therapeutic levels of vancomycin occurs in only a minority of critically ill patients. The condition of the subjects who are not fluid overload and the prolonged administration of vancomycin infusion are factors that may affect the achievement of the target therapeutic level of vancomycin. Keywords: trough concentration, vancomycin, critically ill patients, pharmacokinetics, therapeutic concentration