

# Pharmacokinetic assessment of vancomycin loading dose in critically ill patients

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The vancomycin loading dose (LD) of 25 to 30 mg/kg is a frequently practiced strategy to achieve effective concentrations from the first-treatment dose. However, considering only the body weight for dosing might be inadequate in critically ill patients due to pharmacokinetics changes. We sought to assess achieving optimal trough serum levels of vancomycin and  $AUC_{0-24}/MIC$  in the first 24 h of treatment by using an LD based on population pharmacokinetic parameters of critically ill patients. We performed a concurrent cohort study over 22 months of patients with severe sepsis who received intravenous vancomycin. The patients were treated with three different strategies to initiate vancomycin: without an LD (group A), with an LD of 25 to 30 mg/kg (group B), and with an LD based on population pharmacokinetic parameters of the critically ill patient (group C). An optimal trough serum concentration was achieved in 5, 9, and 83% of patients in groups A, B, and C, respectively. The number of patients that reached optimal  $AUC_{0-24}$  was 2 of 18 (11%), 5 of 11 (46%), and 11 of 12 (92%) in groups A, B, and C, respectively. The statistical analysis for both parameters revealed significant differences in group C with respect to other groups. The administration of the LD calculated from population pharmacokinetic parameters from the beginning of therapy is a more efficient strategy to obtain adequate trough serum concentrations and  $AUC_{0-24}/MIC$  in critical patients. © 2017 American Society for Microbiology. All Rights Reserved.

Critical care

Pharmacokinetics

Vancomycin

creatinine

vancomycin

antiinfective agent

vancomycin

adult

analysis of variance

area under the curve

Article

body mass

clinical article

cohort analysis

controlled study

creatinine blood level

critically ill patient

drug blood level

drug clearance

drug safety

effective concentration

female

Fisher exact test

human

kidney function

loading drug dose

male

middle aged

minimum inhibitory concentration

nephrotoxicity

priority journal

rate constant

sepsis

statistical analysis

volume of distribution

blood

critical illness

drug effects

intensive care

microbiology

procedures

Staphylococcus aureus

Staphylococcus infection

Anti-Bacterial Agents

Cohort Studies

Critical Care

Critical Illness

Humans

Sepsis

Staphylococcal Infections

Staphylococcus aureus

Vancomycin