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## Evaluation of a Vancomycin Dosing Protocol and Pharmacokinetic Parameters in Burn Patients

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## Presentation Abstract

**Title:** Evaluation of a Vancomycin Dosing Protocol and Pharmacokinetic Parameters in Burn Patients

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**Category:** Critical Care – Clinical

**Abstract:** **Introduction:** Burn patients exhibit pharmacokinetic (PK) derangements requiring larger vancomycin doses to reach target serum concentrations. At our institution, vancomycin dosing is performed per a pharmacy-to-dose protocol. The primary objective was to evaluate the effectiveness of this protocol in achieving target vancomycin trough concentrations (Ctr). Secondary objectives were to calculate patient specific PK parameters and determine efficacy and safety of vancomycin use in this population.

**Methods:** This retrospective, observational study included patients with  $\geq 10\%$  TBSA burn injury who received vancomycin with at least one measured Ctr. Exclusion criteria were:  $< 18$  years old, pregnant, prisoner, or at risk for or experiencing acute kidney injury upon vancomycin initiation or up to the time of initial Ctr. Steady state concentrations were used to determine percentage of patients who achieved target Ctr of 10-20 mcg/mL. Secondary endpoints included percentage of patients requiring dose adjustments or with initial Ctr less than 10 or greater than 20 mcg/mL. PK parameters were calculated using steady-state peak and trough concentrations when available. Efficacy and safety were evaluated by total daily dose, time to target Ctr, clinical outcomes, and reported adverse events.

**Results:** Forty patients were screened from 07/01/13 - 02/28/14, with 13 included in the study. Mean  $\pm$  SD TBSA was  $39 \pm 23$ , age was  $51 \pm 17$  years, weight was  $82 \pm 23$  kg, and 77% were male. During the course of therapy, 11 (85%) patients achieved target Ctr, our primary endpoint. Median initial Ctr was 12.7 (8.4-16.9) mcg/mL. In response to the first Ctr, 8 (62%) patients required a dosage adjustment. Mean PK parameters were calculated in subjects with measured peak and trough concentrations who were not receiving renal replacement therapy. In these subjects ( $n=7$ ), vancomycin clearance was  $124 \pm 60$  mL/min, volume of distribution was  $0.79 \pm 0.23$  L/kg, and half-life was  $6.8 \pm 2.5$  hours. Average starting dose was  $37.1 \pm 12.0$  mg/kg/day and average dose to reach target Ctr was  $44.3 \pm 19.5$  mg/kg/day. Median (IQR) time to target Ctr was 2 (2-3) days. Overall, 10 (77%) patients completed vancomycin therapy and were discharged from the hospital. The remaining 3 (23%) patients died, but no deaths were attributed to gram positive infection. There was one case of nephrotoxicity, unrelated to vancomycin.

**Conclusions:** Results are consistent with our previous research suggesting adult burn patients with normal renal function require higher vancomycin doses. A pharmacy-to-dose protocol for vancomycin resulted in a majority of patients (85%) achieving target Ctr during therapy.

**Applicability of Research to Practice:** This study highlights the benefit of a pharmacist-directed approach to dosing and monitoring vancomycin in adult burn patients.