The current continuous infusion of vancomycin dosing scheme used in our population was inappropriate and led to underexposure" Genuini et al (2018).

Abstract:

OBJECTIVE: Describe and assess a continuous infusion dosing scheme of vancomycin therapy in critically ill children.

DESIGN: Retrospective single-center study, January to June 2015.

ReTweet if useful... Therapeutic vancomycin exposure with continuous infusion in critically ill children https://ctt.ec/e97gb+ @ivteam #ivteam

Click To Tweet

SETTING: PICU located within a French tertiary academic pediatric hospital.

PATIENTS: All children admitted in the PICU from January 2015 to June 2015, receiving continuous infusion of vancomycin therapy.

INTERVENTIONS: None.

MEASUREMENTS AND MAIN RESULTS: Clinical and biological data, vancomycin dosing information, and plasma concentrations were recorded. Using a previously published

population pharmacokinetics model, pharmacokinetic parameters were derived for each patient and vancomycin concentrations described after the loading dose. Areas under the curve were estimated for each patient, and an initial covariate-adjusted dose was calculated for every patient. A total of 87 vancomycin concentrations were analyzed from 28 patients between 1 month and 17 years old. The median (range) loading dose was 14.8 (12-16) mg/kg followed by a continuous infusion of vancomycin of 44 (35-61) mg/kg/d. On their first sample, 12 patients (43%) had a concentration between 15 and 30 mg/L. On day 1, the median (range) estimated area under the curve was 349 (201-1,001) mg/L × hr, and seven patients (25%) had an area under the curve greater than 400 mg/L × hr. Using the pharmacokinetics model, the median (range) calculated initial daily dose, taking into account age, bodyweight, and serum creatinine concentration, was 53 (36-69) mg/kg/d resulting in a simulated day 1 area under the curve of 409 (341-593) mg/L × h with a theoretical pharmacokinetic target attainment of 57%.

CONCLUSIONS: The current continuous infusion of vancomycin dosing scheme used in our population was inappropriate and led to underexposure. Using pharmacokinetic approaches such as covariate-adjusted initial dosing and Bayesian estimation of exposure should prove useful for achieving the pharmacokinetic target.

Reference:

Genuini, M., Oualha, M., Bouazza, N., Moulin, F., Treluyer, J.M., Lesage, F., Renolleau, S. and Benaboud, S. (2018) Achievement of Therapeutic Vancomycin Exposure With Continuous Infusion in Critically Ill Children. Pediatric Critical Care Medicine. February 1st. .

doi: 10.1097/PCC.0000000000001474.

Thank you to our partners for supporting IVTEAM