

Purpose: In the neonatal population, gentamicin is utilized for the treatment of gram negative bacteremia as well as for empiric coverage of sepsis. Extended interval dosing for gentamicin in neonates varies by institution due to the wide variety of data. This study aimed to investigate gentamicin dosing in the neonatal population to determine if the current initial dosing (in milligrams per kilogram) protocol should be modified in order to produce a higher rate of therapeutic trough levels.

Methods: This single center, retrospective chart review of patients admitted to the neonatal intensive care unit with an order for gentamicin was conducted from October 1, 2019 through October 31, 2020 at an integrated community health system. Patients received dosing according to the institution's current dosing protocol. The primary objective was to determine the appropriate initial dosing of gentamicin, with dosing intervals stratified by postmenstrual (PMA) and postnatal (PNA) age. Subjects' charts were evaluated for PMA, PNA, body weight at the time of dosing, serum creatinine, gentamicin dose/interval, serum trough concentrations, and dose/interval change upon evaluation of trough level. Included patients were neonates that received at least one dose of gentamicin. Patients were excluded if they had an order for gentamicin but did not have a trough level drawn.

Results: Of the 236 patient charts reviewed, data from 44 patients contributed to this research. The primary outcome of frequency of subtherapeutic (<0.5 mcg/mL) gentamicin trough levels was 45% out of all resulted troughs. Of those 20 subtherapeutic troughs, 75% occurred in the oldest age-directed dosing group (PMA \geq 35 weeks).

Conclusions: Data from this study suggested the need for adjustments to the starting empiric dosing of gentamicin in Stormont Vail Health's neonatal intensive care unit. More specifically, the initial dosing for neonates with PMA of ≥ 35 weeks needs to be increased to reflect AAP's 2018 dosing due to the large percentage of subtherapeutic troughs in this age group.