

Effectiveness of a gentamicin dosing protocol based on postconceptional age: comparison to published neonatal guidelines.

Title: Effectiveness of a gentamicin dosing protocol based on postconceptional age: comparison to published neonatal guidelines.

Publication year: 1992

Journal: The Annals of pharmacotherapy

Authors: Department of Pharmacy Services, Jackson Memorial Hospital, Miami, FL 33136.

Society: Unknown

Origin country: USA

Target countries: USA

DOI: 10.1177/106002809202600416

PMID: 1576392

Source: <https://pubmed.ncbi.nlm.nih.gov/1576392/>

To evaluate the effectiveness of a gentamicin dosing protocol based on postconceptional age in producing therapeutic serum concentrations and to compare the protocol with commonly used gentamicin dosing guidelines.

During the initial three months of this study infants were dosed according to physician discretion (group I). In the subsequent three-month period patients were dosed according to a postconceptional age dosing schedule (group II).

Infants were enrolled after being admitted to the Newborn Intensive Care Unit at the University of Miami/Jackson Memorial Medical Center.

Infants less than 37 weeks gestational age with normal renal function, not receiving indomethacin, and requiring gentamicin treatment were enrolled. Fifty-nine infants were enrolled into group I (median weight 1300 g [range 720-3300]), postconceptional age 29 weeks [26-37]); and 68 infants were enrolled into group II (weight 970 g [530-3000], postconceptional age 29 weeks [24-36]).

Patients in group II were dosed according to the following protocol: postconceptional age less than 30 weeks, 3.0 mg/kg q24h, and postconceptional age 30-37 weeks, 2.5 mg/kg q18h. Peak and trough serum gentamicin concentrations were obtained in all study patients. Pharmacokinetic parameters were calculated from measured serum concentrations. Using the calculated pharmacokinetic data, peak and trough serum concentrations were simulated for five published neonatal dosing guidelines and the proposed postconceptional age protocol.

The number of therapeutic serum gentamicin concentrations resulting from the dosing guidelines studied were compared.

Measured trough concentrations differed significantly between the two groups with 35 percent of patients in group I and 90 percent of patients in group II having trough values less than 2 mg/L (p less than 0.001). There was no significant difference in measured peak concentrations between groups. Simulated trough concentrations were significantly different when postconceptional age dosing was compared with commonly used protocols (p less than 0.0001) with the highest percentage of concentrations less than 2 mg/L (89 percent) resulting from the proposed postconceptional age guidelines.

These data suggest that the proposed postconceptional age protocol is reproducible and reliable in achieving therapeutic gentamicin serum concentrations in neonates.

