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Vancomycin disposition and penetration into ventricular fluid of the central nervous system following intravenous therapy in patients with cerebrospinal devices.

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OBJECTIVE/AIMS: To determine the cerebrospinal fluid concentrations and percent CNS penetration of intravenous vancomycin in patients with cerebrospinal devices at a pediatric institution.

METHODS: We performed a prospective evaluation of intravenous (IV) vancomycin in patients who received a single prophylactic dose of vancomycin (15-20 mg/, maximum dose 1 g) prior to insertion of a CNS shunt (group I) or a therapeutic regimen (a dose of 10-20 mg/kg every 6-12 h) for a documented/suspected shunt infection (group II). Ventricular cerebrospinal fluid (VCSF) samples were taken during the procedure in group I and multiple serum and VCSF samples were collected in group II. Pharmacokinetic parameters were calculated using a one-compartment model, and percent CNS penetration was estimated using area-under-the-curve methodology.

RESULTS: Group I: 21 VCSF samples were analyzed from 19 patients (mean age 7.2 +/- 6.4 years). Over 40% of samples failed to have detectable vancomycin concentrations (range 0-2 microg/ml). Group II: 6 patients (mean age 11 +/- 8.7 years) had VCSF concentrations ranging from nondetectable to 6.59 microg/ml (mean 2.48 +/- 0.52 microg/ml). Percent penetration ranged from 0.77 to 18%.

CONCLUSIONS: Single-dose, pre-operative vancomycin results in low VCSF vancomycin concentrations and repeated dosing in patients with documented/presumed device infections yields variable CNS penetration. (c) 2007 S. Karger AG, Basel.

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