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"The relationship between pharmacokinetic variables and pharmacodynamic profiles of bolus versus continuous infusion of furosemide in critically ill patients"

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Abstract:

In this investigation, the pharmacokinetic variables of continuous infusion and intermittent bolus injection of furosemide and the possible relationship between its pharmacokinetic characteristics and pharmacodynamic profile among intensive care unit (ICU) patients were studied. In this prospective, randomized, clinical trial, twelve patients received IV bolus of 20 mg of the drug during 3 hours period and, the drug dose was doubled, when the urine output was less than 1 ml/kg/h (group 1). The other nine patients received a continuous intravenous furosemide infusion at the rate of 0.1 mg/kg/h (group 2). The amount of furosemide in serum was measured by high performance liquid chromatography (HPLC). Results showed a positive correlation between plasma clearance of furosemide and its diuretic activity (P=0.01). The pharmacokinetic parameters such as Vd (l), CL (ml/min), Ke (min-1) and t½ (min) in continuous infusion patients were not significantly differed from the bolus patients (P-values 0.5, 0.9, 0.9,0.9, respectively). Nevertheless the observed plasma clearance of drug in the continuous infusion group was clinically higher than bolus injection group and as a result the cumulative urine output per hour per mg of furosemide in a continuous infusion was observed to be higher than bolus(P=0.2). Changes in serum sodium and potassium were similar for both groups, but bolus injection patients were associated with higher potassium depletion (P=0.001). Therefore, continuous infusion seems to be better means of diuretic therapy in critically ill patients.

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