Prehospital Administration of Mannitol in Head-Injured, Multiple Trauma Patients

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Hypothesis: Although the benefits of mannitol administration to isolated head injury patients are well-known, early administration of mannitol to the head injured, multiple trauma patient is controversial because of its uncertain effect on the patient's perfusion status. It was hypothesized that prehospital administration of mannitol has no effect on blood pressure (BP).
Design: This was a prospective, randomized, double-blind, placebo controlled, clinical trial from 22 November 1991 to 20 November 1992. Pulse and BP were measured every 15 minutes for two hours.
Setting: Helicopter ambulance service and Level-I trauma center hospital.
Participants: Endotracheally intubated, head trauma victims with a GCS <12 were enrolled within six hours of injury. Patients were excluded if they were <18 years old, had already received mannitol or another diuretic, were potentially pregnant, or were receiving CPR. A total of 44 patients were enrolled. Three enrolled, but ineligible patients were excluded from analysis.
Intervention: Mannitol, 1 gm/kg or equivalent volume of normal saline was administered by the flight team immediately after endotracheal intubation.
Results: The rank sum, analysis of variance, and Dunnett's tests were used for data analysis. Twenty patients received mannitol, and 21 patients received placebo. The groups were similar at baseline in age, pulse, systolic BP (baseline mannitol: 124±47 mmHg, placebo 128±32 mmHg), Glasgow coma scale, and injury severity score. There was no change in systolic BP in either group throughout the observation period. This study had 83% power to detect a drop in systolic BP to less than 90 mmHg.
Conclusion: Prehospital administration of mannitol was not associated with any major change in blood pressure of head-injured, multiple trauma patients.

Intramuscular Injection of Naloxone with a Needleless Jet Injector

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Purpose: Paramedics frequently administer intramuscular (IM) naloxone for narcotic overdose in the prehospital setting. The risk of needlestick injuries and subsequent exposure to HIV and HBV in this high-risk group of patients always is a threat. If equivalent to needle IM, a needleless jet injector could provide a safer means of drug delivery.
Hypothesis: The IM injection of naloxone with a needleless jet injector will be equivalent to needle IM injection.
Methods: After giving informed consent, 15 volunteers (14 male, 1 female) participated in this randomized, cross-over design, IRB-approved experiment. Subjects randomly received 1 mg of naloxone IM in the left deltoid by either the jet injector or by 23g X 1.5" needle. Forty-eight hours later, they were crossed-over to the other method. Blood levels were drawn from a right antecubital vein at two minutes post-injection, and were quantitated by gas chromatography-mass spectrometry using the HP 5890 GC with HP 5970 mass selector device. Two minutes was chosen as being a clinically relevant endpoint. The study was designed with a pretrial power of 80% to detect a difference of 25% or greater. Data were analyzed with two-tailed Student's *t*-test for paired data, with alpha set at 0.05.
Results: The mean (±SD) blood level of naloxone for the jet IM delivery was 0.63 ng/mL (1.1), compared to the mean level of 0.83 ng/mL (0.8) when given with needle IM injection, (p = .39).
Conclusion: In this randomized-crossover, experimental trial, jet injection of equal volumes of naloxone produced similar two-minute blood levels when compared to needle injection. This device may provide paramedics with a safer means of drug delivery.