Comparing Intranasal Fentanyl to Intravenous Morphine for Managing Acute Pain in Children in the Emergency Department

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Study objective: We compare the efficacy of intranasal fentanyl versus intravenous morphine in a pediatric population presenting to an emergency department (ED) with acute long-bone fractures.

Methods: We conducted a prospective, randomized, double-blind, placebo-controlled, clinical trial in a tertiary pediatric ED between September 2001 and January 2005. A convenience sample of children aged 7 to 15 years with clinically deformed closed long-bone fractures was included to receive either active intravenous morphine (10 mg/mL) and intranasal placebo or active intranasal concentrated fentanyl (150 μg/mL) and intravenous placebo. Exclusion criteria were narcotic analgesia within 4 hours of arrival, significant head injury, allergy to opiates, nasal blockage, or inability to perform pain scoring. Pain scores were rated by using a 100-mm visual analog scale at 0, 5, 10, 20, and 30 minutes. Routine clinical observations and adverse events were recorded.

Results: Sixty-seven children were enrolled (mean age 10.9 years [SD 2.4]). Fractures were radius or ulna 53 (79.1%), humerus 9 (13.4%), tibia or fibula 4 (6.0%), and femur 1 (1.5%). Thirty-four children received intravenous (IV) morphine and 33 received intranasal fentanyl. Statistically significant differences in visual analog scale scores were not observed between the 2 treatment arms either preanalgesia or at 5, 10, 20, or 30 minutes postanalgesia (P=.333). At 10 minutes, the difference in mean visual analog scale between the morphine and fentanyl groups was −5 mm (95% confidence interval −16 to 7 mm). Reductions in combined pain scores occurred at 5 minutes (20 mm; P=.000), 10 minutes (4 mm; P=.012), and 20 minutes (8 mm; P=.000) postanalgesia. The mean total INF dose was 1.7 μg/kg, and the mean total IV morphine dose was 0.11 mg/kg. There were no serious adverse events.

Conclusion: Intranasal fentanyl delivered as 150 μg/mL at a dose of 1.7 μg/kg was shown to be an effective analgesic in children aged 7 to 15 years presenting to an ED with an acute fracture when compared to intravenous morphine at 0.1 mg/kg

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