

Retrospective Case Series of Buprenorphine Toxicity in the Pediatric Patient

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Background

Buprenorphine is a partial mu-opioid agonist that is commonly prescribed for opioid addiction maintenance. Increasing utilization has been associated with more accidental pediatric ingestions. In adults, a ceiling effect on respiratory depression has been observed, but has not been fully evaluated in children.

Hypothesis

Buprenorphine causes significant toxicity in accidental pediatric ingestions which may be reversed by naloxone.

Methods

Pediatric patients less than 6 years old who presented to a tertiary care pediatric hospital and were evaluated by a medical toxicologist over a 5 year period were reviewed. Demographic information, reported dose, time to symptom onset, need for naloxone, and clinical respiratory information was obtained from the medical record.

Results

36 patients were enrolled. Mean age was 2.0 years (0.6-4.6). Evidence of toxicity was observed in 33 patients. Symptomatic patients demonstrated sedation (100%), miosis (76%) and dystaxia (39%). 14 (42%) patients had respiratory compromise including hypoventilation (57%), need for oxygen supplementation (64%), and/or need for intubation (14%). 23 patients had a well-defined time of ingestion. In these individuals, mean time to onset of symptoms was 1.3 hours (0.3-4.0). 5 patients did not have clear time of ingestion. 5 others were known to be less than 4 hours, but a specific time of ingestion could not be established. Intravenous naloxone was utilized in 17 (52%) patients. 47% of these patients had complete resolution of their symptoms after only one dose. 5 (29%) patients required multiple doses of naloxone to return to baseline. 4 (24%) patients did not have any effect with the antidotal therapy.

Discussion

Due to the high incidence of respiratory depression, the authors recommend all children under 6 years of age with possible buprenorphine ingestion receive an immediate medical evaluation. An observation period of 6 hours, as previously recommended, remains an adequate observation period if no symptoms develop prior to discharge. Should symptoms develop, the patient should be observed until these resolve. Naloxone administration has some antidotal activity, however, resistance to naloxone is observed.

Conclusion

Buprenorphine toxicity in the pediatric population has a high rate of respiratory depression and naloxone rescue therapy has varying effects.