

Reference

1. O'Dwyer PJ, McGregor JR, McDermott EW, et al. Patient recovery following cholecystectomy through a 6 cm or 15 cm transverse subcostal incision. A prospective randomized clinical trial. *Postgrad Med J* 1992;68:817-9.

Altering Epidural Morphine Side Effects with Butorphanol in Children

To the Editor:

The conclusions by Bailey et al. (1) are not supported by the results presented in their prospective study comparing bolus administration of epidural butorphanol, intravenous butorphanol, or placebo given simultaneously with an epidural morphine bolus after major abdominal or thoracic surgery in pediatric patients. The abstract concludes that butorphanol has *little or no* effect on the side effects of epidural morphine. Yet the findings of Bailey et al. show that pruritus is actually decreased with epidural butorphanol ($P \leq 0.05$).

Regarding other side effects: respiratory depression did not occur in any group, perhaps because the number of patients studied was too small; urinary retention defies accurate analysis since 53 of 60 patients (88%) had a urinary catheter in place; and vomiting cannot be accurately assessed since 37 of 60 patients (62%) had nasogastric tubes in place. Sedation was significantly increased only when the epidural butorphanol group was compared with the saline/morphine group at 3 h postoperatively. (The sedation effect was seen as beneficial to the patient by Bailey et al. and was associated with better analgesia.)

The conclusion of the article states that epidural butorphanol 30 $\mu\text{g}/\text{kg}$ does not significantly reduce the *overall* incidence of side effects of 60 $\mu\text{g}/\text{kg}$ of epidural morphine postoperatively. In reality, the only side effects that warranted this *overall* conclusion were pruritus and sedation, and both were altered in a desirable manner when epidural butorphanol/morphine was given and compared with the other two groups. Even though Bailey et al. mention these positive aspects of epidural butorphanol, the manner in which the abstract and text conclusions are written is biased to give one the impression that epidural butorphanol at 30 $\mu\text{g}/\text{kg}$ in combination with 60 $\mu\text{g}/\text{kg}$ morphine is ineffective in modifying side effects in a desirable way.

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Reference

1. Bailey AG, Valley RD, Freid EB, Calhoun P. Epidural morphine combined with epidural or intravenous butorphanol for postoperative analgesia in pediatric patients. *Anesth Analg* 1994;79:340-4.

In Response:

We thank Drs. Lawhorn and Schmitz for their interest and close perusal of our article. We are in agreement that epidural butorphanol offers benefits to some children receiving epidural morphine.

Our hypothesis was that an agonist/antagonist would *prevent* undesirable side effects of epidural morphine. Our data did not support this. The actual incidence of pruritus, vomiting, urinary retention, and respiratory depression was not significantly different among the three groups. The numbers of patients without nasogastric tubes and urinary catheters were small; the fact that these patients experienced vomiting and urinary retention after butorphanol supports our contention that, with this dose, side effects are not prevented. The overall incidence of pruritus was not prevented, only reduced in its severity. We agree that this has its merits.

The sedation is not a side effect of the morphine. This is a well-recognized effect of butorphanol. We agree that this is advantageous in some children, but our conclusions addressed attempting to reduce the epidural morphine side effects.

We do not feel that we were biased in our conclusions. Correctly stated, the addition of butorphanol did not decrease the incidence of side effects attributed to epidural morphine. It did, however, add a beneficial side effect of its own, sedation!

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Precipitation of Thiopental by Some Muscle Relaxants

To the Editor:

Precipitation may occur when an acidic solution is added to a basic solution. During induction of anesthesia, this phenomenon may be encountered when a basic drug such as thiopental (pH 8.5-10.5) remains in the intravenous (IV) tubing at the time of injection of acidic drugs such as some of the muscle relaxants. Depolarizing and nondepolarizing muscle relaxants that are acidic in nature include succinylcholine (pH 3.5), rocuronium (pH 4.0), atracurium (pH 3.25-3.65), pancuronium (pH 4.0), and vecuronium (pH 4.0). These muscle relaxants will precipitate thiopental acid out of solution (1-3). d-Tubocurarine (pH 2.5-5.0) may produce precipitation of thiopental if the pH of the tubocurarine is at its lower limit. Precipitation in the syringe does not occur with pipercuronium (pH 6.0), doxacurium chloride (pH 3.9-5.0), or mivacurium (pH 3.5-5.0) (personal observation).

The issue of precipitation becomes very important in rapid sequence inductions of anesthesia when a muscle relaxant is injected immediately after thiopental. Precipitation is more likely to occur when the IV fluid does not flow freely and with use of small-bore angiocatheters (22-gauge or smaller). We observed one such occurrence with rocuronium. The precipitation was significant enough to totally occlude the IV tubing.

We hope this letter will shed light on the compatibility of muscle relaxants with basic solutions such as thiopental. We wish to recommend that the possibility of precipitation and obstruction be considered when there is cessation of IV flow during an induction using any of the acidic muscle relaxants with the exception of doxacurium, mivacurium, and pipercuronium.

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References

1. Trissel LA. Handbook on injectable drugs. 7th Ed. Bethesda, MD: American Society of Hospital Pharmacists, 1992.
2. Omoigui S. The anesthesia drugs handbook. 2nd Ed. Philadelphia: Mosby Year Book, 1995.
3. Stoelting RK. Pharmacology and physiology in anesthetic practice. 2nd Ed. Philadelphia: JB Lippincott, 1991.

Transesophageal Echocardiography and Normal Variants

To the Editor:

One of the major uses of echocardiography is detection of objects in and around the heart. With increasing intraoperative use of transesophageal echocardiography (TEE) by anesthesiologists, the potential exists that detection of an object that is in reality a rare, yet