Intrathecal Baclofen toxicity: an unusual cause of pediatric post-operative coma and respiratory depression

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Learning Objectives

- To recognize intrathecal baclofen toxicity as a cause of post-operative mental status changes
- To recognize the clinical presentation of baclofen intoxication
- To understand the role of physostigmine in the treatment of baclofen overdose

Background Information

Intrathecal baclofen (ITB) pumps are being increasingly used for treatment of spastic disorders in children. Over 10,000 pumps have already been implanted nationwide. With the increased prevalence of these devices, anesthesia providers need to be conversant with possible perioperative complications associated with ITB pumps and the clinical manifestations of baclofen toxicity.

Preoperative Presentation

A 17-yr old, 57kg ASA II male with moderately severe spastic quadriplegia CP was scheduled for ITB pump change. His background history included preterm delivery at 26 weeks, following which he was diagnosed with spastic quadriplegic cerebral palsy at age 2yr. He continued to develop reasonably well with only moderate cognitive impairment but had moderately severe spasticity. Previous surgical procedures include selective dorsal rhizotomy at age 5yr, left hip varus osteotomy and adductor tenotomy. Additionally, he had an ITB infusion unit implanted for progressive and severe spastic quadriplegia at age 11yr.

Intraoperative Course

The present operation was to change out the old ITB pump, which had reached the end of its service life. The ITB pump replacement operation was performed under general endotracheal anesthesia and it lasted 2.5hr during which the patient received a total of 100mcg of intravenous (IV) fentanyl and 5mg of IV morphine, for pain control. Muscle relaxant was adequately reversed at the completion of surgery and the patient was extubated awake in the operating room and transported to the post anesthesia care unit.

Postoperative Course

Forty-five minutes after admission to the recovery room, he was noted to be lethargic, hypotensive, bradycardic, and severely bradypnic (6-8 breaths/minute). Further assessment revealed a semi-comatose patient who exhibited global hypotonia, hyporeflexia, and miotic pupils. After unsuccessful treatment with naloxone and consultation with the neurosurgeon, the patient was given physostigmine 1mg IV with atropine 0.2 mg IV. The patient’s vital signs normalized and he promptly became rouseable, had improved muscle tone, and began to attempt to self-extubate. He was extubated at this point. Following extubation, the patient remained awake and conversant for approximately 40 minutes after which he again experienced severely depressed sensorium. A second dose of physostigmine was given with only a transient response. At this point the patient was reintubated, his ITB pump was turned off, and he was transferred to the intensive care unit. His muscle strength and mental status returned to baseline over the ensuing 8 hours at which time he was extubated and ultimately discharged two days later on a reduced ITB dose.

Discussion

- The number of children with ITB pumps is increasing
- Perioperative providers are likely to be unaware of a baclofen overdose if it occurs and need to recognize the signs and symptoms
- Clinical features of baclofen overdose include
  - Depressed sensorium
  - Hypotonia/ hyporeflexia
  - Bradycardia
  - Bradypnea

Baclofen overdose may mimic other common perioperative conditions
- Treatment is largely supportive but specific measures may include
  - Stopping and/or emptying the pump
- No antidote for baclofen is available, but physostigmine (0.02 mg/kg up to 2 mg) IV or IM can antagonize systemic effects of baclofen
- Physostigmine duration of action is only 45 minutes, so repeat dosing is often necessary
- Removal of 25-30 ml of CSF is also recommended to decrease baclofen load

References