

A Prospective Observational Audit to Determine the Incidence and Etiology for Earlier Than Planned Discontinuation of Epidural Analgesia and Breakthrough Pain in Children

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Table 1 - Results

		Missing data(n)
Caudally threaded epidural to thoracic level (n)	4/78 (5%)	3
Lumbar epidural (n)	54/78 (69%)	3
Thoracic epidural (n)	20/78 (26%)	3
Duration of use CEA (days)	3.09 +/-0.95	1
Prematurely terminated CEA - for any reason (n)	15/80 (19%)	1
Prematurely terminated CEA - due to poor pain control (n)	9/80 (11%)	1
Breakthrough pain - not due to painful muscle spasm or "one-sided" epidural (n)	46/80 (57%)	1
Patients with documented episode of moderate pain (>4/10) (n)	27/75 (36%)	6
Patients with documented episode of severe pain (>7/10) (n)	16/75 (21%)	6
Patients who received morphine (n)	63/79 (80%)	2
Total morphine equivalent dose (mcg/kg)	442 +/-504	2
Average daily morphine equivalent dose (mcg/kg/day)	162 +/-196	2
Catheter disconnect from filter (n)	3/79 (4%)	2
Catheter leak at puncture site (n)	19/79 (24%)	2
Inadequate analgesia in those with a catheter leak (n)	17/19 (89%)	

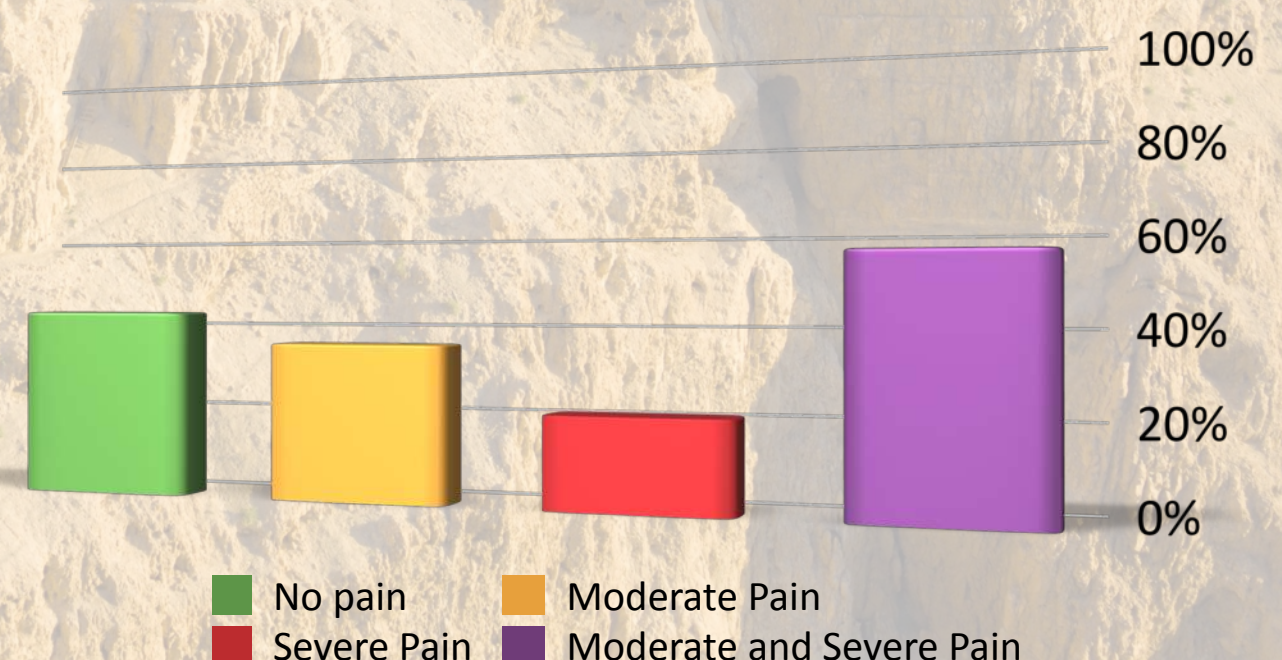
Introduction: Continuous Epidural Analgesia (CEA) is an effective method to provide post-operative analgesia with high patient satisfaction⁽¹⁾. Clinical benefits in pediatric patients include decreased length of hospital stay and reduced requirement for PICU admission⁽²⁾. CEA is often left in place for about 3 days post-op. In adults a failure rate of 22% has been reported, most commonly due to catheter dislodgement⁽³⁾. The incidence and cause of failure is less well-described in the pediatric population. We prospectively sought to determine the incidence and causes of epidural failure at our institution.

Methods: After ethics approval, we recruited cognitively intact patients who received CEA for post-operative pain control at the Hospital for Sick Children during the 2014 and 2015 calendar years. A total of 81 patients were recruited and data prospectively collected. Patients ranged from newborn to 18 years and underwent orthopedic, urologic or general surgery. Inclusion criteria required ongoing CEA on arrival to the ward after PACU discharge. Primary outcome was CEA discontinued earlier than planned. Secondary outcomes included duration of CEA use, incidence of breakthrough pain, incidence of moderate or severe pain, catheter disconnect and catheter leak.

Results: Our study population included 27 females (38%), 52 males (62%), range of 2 months to 18 years (mean 8.9 years) and a weight range of 4.4 to 63.8 kg (mean 29.4 kg). Results are reported in Table 1.

Discussion: Prematurely discontinued pediatric epidural rate (19%) is similar to the adult population (22%). Pain is the main reason (60%) for discontinuation, with 80% of all patients receiving opiates. Catheter leak at the puncture site (24%) is higher than in adults⁽³⁾ and correlates with inadequate analgesia (89%), possibly due to anesthesia solution leakage. Further investigation is needed to determine if needle size, number of attempts, catheter depth in the epidural space and using a skin sealant may improve pain outcome.

Graph 1 - Breakthrough pain



References:

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- Ballantyne, J. C., McKenna, J. M., & Ryder, E. (2003). Epidural analgesia—experience of 5628 patients in a large teaching hospital derived through audit. *Acute Pain*, 4(3-4), 89-97.

