EPIDEMIOLOGY, EFFECTIVENESS AND SAFETY OF CONTINUOUS CAUDAL ANALGESIA ADMINISTERED THROUGH A CATHETER ADVANCED TO THE LUMBAR AND THORACIC REGIONS IN 19 NEWBORNS

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Continuous epidural analgesia (CEA) in paediatric population is a well-accepted technique, commonly used in combination with general anaesthesia. The aim of this study is to analyse, according to epidemiological, effectiveness and safety parameters, all **newborns** with continuous **caudal** infusions administered through a **catheter advanced to the lumbar and thoracic regions**, subjected to major thoraco-abdominal procedures in a **12-month period**, in a tertiary care hospital.

MATERIAL AND METHODS

Retrospective analysis of all children undergoing major surgery with continuous caudal epidural technique in year 2015 in Gregorio Marañón General University Hospital.

Collected settings

- Epidemiological data included weight, age, associated conditions, previous respiratory support, type of surgery and type of incision.
- Analgesic effectiveness was measured using three different parameters: morphine consumption in the Intensive Care Unit, time to extubation and beginning of oral feeding.
- Safety settings include evaluation of local anaesthetic toxicity or technique complications.

Protocol

- After written informed consent was obtained from parents and in absence of contraindications, 19 caudal catheters advanced to the lumbar or thoracic cord levels were placed (figure 1). We used ultrasonography in order to guide the correct placement (figure 2).
- Intermittent bolus of 0.2% or 0.25% bupivacaine (0.25-0.75 ml/kg) were administered during surgery. Continuous 0.1% ropivacaine perfusion of 0.1-0.3 ml/kg/h, combined with intravenous paracetamol at a dose of 10 mg/kg/ every 8 hours, was used for post-operative pain management up to 72 hours in the Neonatal Intensive Care Unit. Analgesic control supervision was performed by the Paediatric Pain Management Unit.

Figure 1. Caudal catheter placement in a neonate.

Figure 2. Sagittal ultrasound image of the caudal catheter advancement to the thoracic region.

RESULTS

Epidemiological results

- n:19 neonates (M:8, F:11)
- Postconceptional mean age was 40 weeks (34 to 42 weeks). 11 patients were preterms.
- Mean weight was 2600g (1510 to 3760 g).
- 2 patients needed CPAP as previous respiratory support.
- Most patients had associated comorbidities (prematurity, patent *ductus arteriosus*, bronchopulmonary dysplasia, intracerebral haemorrhage, short bowel syndrome, Down syndrome, Hirschprung disease and cystic fibrosis).
- The most common type of procedure performed was bowel atresia (5). Other surgeries: bowel obstruction (4), gastrointestinal reconstruction (3), gastroschisis (1), evisceration (1), biliary atresia (1), oesophageal atresia (1) and aortic coarctation (1).
- First surgery for most patients (14).
- Most frequent incision: supraumbilical transverse laparotomy.

Effectiveness results

- Successfully pain control was achieved in 8 patients. 9 patients required 1 or 2 morphine bolus and 2 patients needed continuous infusion of morphine.
- More than 50% (11) of patients were extubated in the operating room, and 74% of them in the first 24 hours.
- When indicated, oral feeding was started within 72 hours following surgery in all patients.

Safety results

- No complications related to caudal catheter placement or ropivacaine perfusion were described.
- One accidental catheter removal was noticed.
- One patient needed plasma infusion previous to catheter withdrawal due to concomitant coagulopathy.

DISCUSSION

Regional anaesthesia benefits

- Other authors concluded similar clinical results as we present.
- CEA is a useful and safe technique, also in preterms.
- CEA provides effective analgesia in supraumbilical transverse laparotomy and thoracotomy and it may allow reducing opioid consumption in the intra and post-operative period.
- CEA gives the possibility of precocious extubation of infants with respiratory comorbidities.
- CEA also gives the possibility of early oral feeding in major abdominal surgery.

LEARNING POINTS

CEA provides safe, reliable and effective analgesia for both general neonates and preterms undergoing major thoraco-abdominal surgery. Other potential benefits, such as a decrease of intravenous opioids and thereby early tracheal extubation and early oral feeding, have been observed. On the other hand, considering neonates as one of the most vulnerable populations, large and well-designed randomized controlled trials are necessary to establish a firm conclusion.

REFERENCES

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