

Post Operative Pain Management In Children

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Abstract

Recently the issue of chronic pain in children was elicited.[1]

It seems that pain ethics and pain management does not come only to the strong adult populations but include all the spectrum of age. [2,3,4].

Pain is defined by the International Association for the Study of Pain as an unpleasant sensory and emotional experience associated with actual or Potential tissue damage It is now accepted that pain should be anticipated, safely and effectively controlled, in all children, whatever their age, maturity or severity of illness .Unfortunately the postoperative pain in pediatric patient is not adequately managed despite of it's cause of morbidity and even some reported mortality [5]

PAIN EVALUATION

Pain measurement in children is difficult, this has led to the proliferation of a multiplicity of pain measurement for neonates, infants and children. Most scores try to assign a numerical value to one of these dimensions: cognitive, physiological, sensory, behavioral, and even facial expression, the anesthetist must be adequately trained and sensitive to the manifestations of acute pain in the various age groups and must be experienced in intervening safely, effectively and appropriately to control the pain.[6]

CONSIDERATION POINTS IN POSTOPERATIVE PAIN MANAGEMENT

1. A well organized plan . The post operative pain treatment must be included in the anesthetic planning even before induction of anesthesia, adopting the idea of “ managing pain before it occurs “, [7]

2. Medical attitudes and patient education : Adequate time must be invested in the preoperative visit to the parent and child ,to assure and explain that the immediate post operative period is going to be pain free ,In a questionnaire done in our institute we include in our pre-operative evaluation visit to all pediatric patient the question of what is the most fearful event -the child or guardian - are afraid from ,and we found that about 64% of all parents as well as most children age >6 year were afraid from having uncontrolled pain ,this concern came ahead from other causes as separation from parents and strange surrounding [8]

3. Clinical protocols:

All children in the post surgical recovery room should be regularly assessed for the presence of pain, its intensity and its cause. Titration of analgesia to control pain and documentation of the efficacy and adverse effects of pain management should be routine in all age groups. Regardless of the adopted scoring system, the assessments should be repeated regularly, appropriate interventions should be prescribed and their effectiveness in reducing the pain severity should be regularly documented.

4. Disciplinary involvement:

Although the immediate postoperative pain care is the responsibility of the anesthetist the pediatric surgeon must be involved in the planning of the pain regimen control especially in cases where regional techniques are performed or combined regional-general anesthesia is planned.

MANAGEMENT

The past decade has brought about an explosion of knowledge the path physiology of acute pain and analgesic pharmacology. Many new techniques and methods applicable for pain management in pediatric patient in the post operative period depend on the patient, underlying medical conditions, the type of surgery, the patient's disposition following surgery (inpatient vs. outpatient), and the physician's comfort level with a particular analgesic regimen. [9]

The most important role in postoperative pain management is still played by opioid administered through various modes. However, non-opioid analgesics, i.e.non-steroid anti-inflammatory drugs and paracetamol [10] are more and more

frequently used in the management of postoperative pain. The appearance on the market of intravenous forms of these drugs could make them play more important role in the post operative period. In our protocol of Post-operative pain management we should remember always: 1. use two analgesics, one narcotic and one non narcotic. 2. use timed analgesics and avoid PRN. 3. start the post operative pain management intra-operatively.

A. NON-OPIOID ANALGESICS

Paracetamol (acetaminophen) owing to its safe therapeutically profile, should be the primary postoperative pain management tool in a majority of surgical procedures [11] (e.g. a suppository of Tylenol 100 mg or 20 drops of Adol 20 minutes before conclusion of surgery) noting that the calculated dose of acetaminophen at which 50% of the children not requiring a rescue opioid was 35 mg/kg. The rectal bioavailability in the very young is higher than older children, this require proper calculation of the dose since clearance is reduced in neonates, and neonates are capable of forming the reactive intermediate metabolites that cause hepatocellular damage particularly after multiple doses. [12]

NSAIDS - this group of drugs has become extremely popular for treating postoperative pain in children as they are effective with few side effects and produce an opioid sparing action through decreasing the inflammatory mediators generated at the site of tissue injury. They should be avoided in patients with coagulopathy, nephropathy, gastropathy and asthma. Diclofenac 1-3 mg/kg per day in divided doses is widely used. It is also available as a suppository. Ketorolac intravenously 0.5-1.0mg/kg the maximum daily dosage is 90 mg, is as effective analgesic as morphine, Ketorolac is not recommended for use in infant aged <1 year. [13, 14]

Aspirin (Acetylsalicylic acid) This should not be used for children under 12 years because of the association with Reye's syndrome.

3. Combination of NSAIDs and paracetamol in order to relieve pain allows both for a significant reduction in the dosage of respective drugs, fewer side effects and an improved pain relief. Regular administration of paracetamol and NSAIDs decreased morphine requirement. [15]

4. Ketamine in the management of postoperative Relief of pain,

Ketamine is in use for almost 3 decades. The role of the

(NMDA) N-methyl-D-aspartate receptor in the processing of nociceptive input has led naturally to renewed clinical interest (NMDA) receptor antagonists such as ketamine. There are evidences about the efficacy of low-dose ketamine in the management of acute postoperative pain when administered alone or in conjunction with other agents via the oral, rectal, intramuscular, subcutaneous, intravenous and intraspinal routes. Low-dose ketamine is defined as a bolus dose of less than 2 mg/kg when given intramuscularly or less than 1 mg/kg when administered via the intravenous or epidural route. Low-dose ketamine may play an important role in postoperative pain management in the future, some more study may be needed as regards the associated side effects. [16,17,18,19] A recent review could not conclude that Ketamine in low dose had definite advantages in postoperative analgesia. [20]

Injection of ketamine was used in fifty children undergoing inguinal herniotomy were allocated randomly to three groups to receive a caudal injection of either 0.25% bupivacaine 1 ml kg⁻¹ with or without ketamine 0.5 mg kg⁻¹ or ketamine 0.5 mg kg⁻¹ with normal saline 1 ml kg⁻¹. There was no significant difference in quality of pain relief, postoperative behaviour or analgesic requirements between the ketamine group and the two other groups. The bupivacaine-ketamine mixture provided better analgesia than the bupivacaine solution alone. Side effects such as motor weakness or urinary retention were not observed in the ketamine group. [21].

Subsequently many research papers used this technique in different lower abdominal surgery in children.

The addition of 0.5 mg kg⁻¹ S(+)-ketamine to levobupivacaine 0.175% for caudal analgesia for lower abdominal and urological surgery is significantly more effective in providing postoperative analgesia than levobupivacaine 0.15% with 0.5 mg kg⁻¹ S(+)-ketamine or levobupivacaine 0.2%.. [22]

5. Tramadol is interesting because it has nonopioid and opioid actions that can be attributed to the two isomers found in the racemic mixture, with low affinity for opioid receptors. It is used extensively in postoperative management. The postoperative analgesic potency roughly similar to morphine but without relevant cardiovascular or respiratory depressant, and a very low dependency liability. It appears to be well tolerated, oral (2.5 mg/kg), intramuscular and intravenous analgesic (2mg/kg) [23] 6. Spinal neostigmine and the use of adenosine represent

completely different mechanisms of nonopioid analgesia and it is still under investigation [24].

B. OPIOIDS

Opioids may be administered by IM, IV transdermal and oral routes [25]. Children are sensitive to opioids and doses should be reduced accordingly. This should not be given to children <5kg. The intranasal administration of sufentanyl 1.5 µg/kg 10 minutes before the end of sevoflurane anesthesia will give you very satisfactory results. The transdermal administration of fentanyl provides steady-state plasma concentration. The acceptance of oral fentanyl in children is very good [26]. In spite of its association with increased incidence of nausea and vomiting.

C. LOCAL ANESTHETIC

1. Local wound infiltration with bupivacaine 0.25% at the conclusion of surgery is very effective and is extremely simple and safe. It reduces the need for additional measures [28].

2. Regional Blocks : Many pediatric anesthesiologists and surgeons have excellent success with the utilization of regional anesthetic techniques as treatment for postoperative pain. These include intercostal blocks following thoracotomy, ilio-inguinal and ilio-hypogastric nerve blocks following hernia repair, orchidopexy, dorsal nerve blocks of the penis or caudal blocks following circumcision. These blocks not only provide excellent postoperative analgesia, but are great adjuncts to general anesthesia. Additionally, the use of epidural opioids is extremely useful in patients following major abdominal, thoracic, and orthopedic surgeries. [29,30] The usual Guidelines for local anesthetics use must be obeyed and Proper doses of local anesthetics considering the maximum safe doses. The recommended maximum dose of Bupivacaine is 2 mg/kg or Lignocaine 4 mg/kg. These dosages are the maximum for a correctly injected dose. If the drug is mistakenly injected intravenously very small dosages may cause serious toxicity.

Contraindications of regional techniques.

1. Unfamiliarity with the technique” do not experiment “ Always perform the technique you are familiar with.
2. Infections near the site of the needle insertion.
3. Coagulopathy or anti coagulation therapy
4. Pilonidal cyst (caudal block)
5. Congenital abnormalities present in the lower spine or meninges because of the unclear or impalpable anatomy.

D. PATIENT CONTROLLED ANALGESIA

PCA in a pediatric patient is modified to become a nurse or parent controlled analgesia (PNCA) however a special education for parents are prerequisites [29] children are defenseless and are depending upon our care, the first thing we must do is to believe the child pain is real if the child says that it hurts, it hurts, Unrelieved pain increases the patient's anxiety and apprehension, which in turn increases the intensity of pain the current situation in postoperative pain management indicates more room availability for improvement, especially in the area of patient education. Optimizing postoperative pain control is the key to further advancement in the field of ambulatory anesthesia. Preoperative administration of analgesia would decrease the intraoperative analgesic requirement, which may lead to a smooth and rapid recovery [30].

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