

health  
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assessment



## EXECUTIVE SUMMARY

### Rational Use of Analgesics in Pediatrics

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## **EXECUTIVE SUMMARY**

### **1. INTRODUCTION**

Pain commonly experienced by children is acute pain resulting from injury, illness, and necessary medical procedures, while the other types include chronic pain, recurring pain, and pain associated with terminal illness. It affects children physiologically and emotionally if not managed and treated well. In children it is often inadequately assessed and treated due to the fact that children have difficulty in expressing pain to adult caregivers, while perceptions of their pain also differ widely. There are pharmacological and non-pharmacological approaches in pain management with good efficacy in both acute and chronic pain experienced by the children. A combined approach of non-pharmacological and pharmacological techniques has also been recommended for optimum pain relief and to reduce distress in neonates and children. A validated pain tool is needed for assessing pain in children.

### **2. POLICY QUESTION**

Which are the analgesics and analgesic modalities that are safe, effective and cost effective for use in children?

### **3. OBJECTIVES**

To determine the safety, effectiveness and cost effectiveness of the commonly used pharmacological and non-pharmacological modalities of pain management in paediatric population.

### **4. METHODOLOGY**

The electronic databases, hand-search and search by cited references in some of the papers were carried out. Relevant papers were critically appraised and graded according to the modified CAHTA scale.

### **5. RESULTS**

#### **5.1 Pharmacological agents**

##### **Acetaminophen (Paracetamol)**

There is sufficient evidence to show that there is minimal risk of developing toxic reactions to acetaminophen when used at therapeutic doses. Acetaminophen is hepatotoxic with inappropriate/excessive dosing, impaired liver function and when ingested with other hepatotoxic drug. Rectal administration of acetaminophen may produce high peak drug levels.

There is good evidence on the effectiveness of paracetamol in providing acute post-operative pain control in various surgical procedures, whether given pre-operatively or in the immediate post-operative period. Rectal acetaminophen has not been to be effective in controlling pain satisfactorily. Evidence also shows that combining paracetamol with other analgesics like codein, diclofenac, ibuprofen or rofecoxib does not provide superior pain control compared to using paracetamol alone.

### **Non-steroidal anti-inflammatory agents (NSAIDs)**

There is sufficient evidence to show that ibuprofen, diclofenac, ketorolac and ketoprofen are reasonably safe. Nausea and vomiting are common side effects. These drugs may also cause mild to severe homeostasis defects peri-operatively. There is also evidence that they are effective in relieving pain in immediate post-operative period and during recovery for various ophthalmic, ear, nose and throat surgical procedures that are administered through various routes i.e. oral, intravascular, intramuscular, rectal or topical.

### **Opioids**

Evidence shows that opioids can cause hypotension and respiratory depression in high doses. Fentanyl has been found to cause fewer side-effects compared to morphine. There is sufficient evidence to show that opioids are potent analgesics for moderate to severe pain. Their sedative and analgesic effects are dose dependent. There is sufficient evidence that morphine and fentanyl are effective for relief of moderate to severe pain post-operatively in various surgical procedures like ophthalmic, ENT, cardiac procedures, and procedures carried out during the neonatal period. Evidence also shows that the synthetic opioid, fentanyl, is 100 times more potent than morphine, and is effective for out-patient procedural care either in the out-patient setting or emergency department, due to its rapid onset and short duration of action. It is also effective for acute pain relief by administration through transmucosal and intra-nasal routes. Patient controlled analgesia has also been found to be effective for the management of moderate to severe pain post-operatively in older children and adolescents.

### **Local anaesthetic agents**

Most evidence indicates that Lidocaine-prolocaine cream, is safe as topical analgesia for pain associated with circumcision and medical procedures such as venepuncture. However, there is a risk of methemoglobinemia particularly in premature infants as well as term infants aged less than 3 months. It is also effective for reducing pain during circumcision but the evidence of its effectiveness for analgesia in medical procedures is inconclusive.

### **5.2 Non-pharmacological modalities**

There is evidence that skin-to-skin contact is a safe intervention against pain in the newborn, but there is insufficient evidence on its effectiveness. As for the other behavioural interventions, there is insufficient evidence on their effectiveness. There is limited evidence on the effectiveness of cognitive behavioural interventions to reduce pain stimuli.

### **5.3 Other modalities**

Evidence shows that sucrose is a safe to be used with minimal side effects. It is an effective intervention against procedural pain in the term newborn. There is some evidence that glucose is a safe intervention against pain associated with minor procedures

in neonates, but findings on its effectiveness were inconclusive. There is insufficient evidence of effectiveness of artificial sweetener against pain.

#### **5.4 Assessment tools**

There are several pain assessment tools that can be used to measure pain in the different age groups i.e. pre-term infants, neonates, infants and children. Children's families, especially parents, are important in identifying children's behaviour in response to painful stimuli though these may not be as accurate as that of the child.

### **6. RECOMMENDATIONS**

Pharmacological agents like acetaminophen, NSAIDs like ibuprofen, diclofenac, ketorolac and ketoprofen, and opioids like fentanyl are safe and effective analgesics for use in various surgical procedures that produce mild, moderate and severe painful stimuli. However, the side effects of these need to be taken into consideration with constant monitoring carried out.

Pain assessment tools taking into consideration parents' assessment and/or child's self-report can be used to measure pain.