Pain management in Paediatric Palliative Care

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14th August 2017
Content

• Management of pain in children
  ▪ Non pharmacological
  ▪ Pharmacological
Exit level outcomes

The participants will:

• Know the general principles of pain management as described by WHO

• Understand the realities and misconceptions surrounding opioid drugs.
What do we understand about pain?
Causes of pain in Children

• Start from head to toes
Mouth
Ears
Parotitis and Lymphadenitis
Shingles
TB abdomen
Arthritis
Nappy rash
Generic Approach to Pain

1) Reverse the reversible
2) Use Non-drug measures
3) Use Drug measures
   a) specific to the cause
   b) general
4) Address associated psychosocial distress

   e.g. Child with oral thrush

      1) improve mouth hygiene
      2) soft foods
      3) a) topical soothing gel, antifungal
         b) analgesic
      4) explanation and reassurance to mother
Reverse the reversible

- Seek underlying cause
- Treat what can be treated
- Stop offending drugs if possible
Non-pharmacological measures

Swaddling
Positioning
Handling
Massage
Warmth
Distraction
Music Therapy
Environment
How to prescribe medication
Drug measures: Analgesics

• Correct use of analgesic drugs will relieve pain in most children!

• **4 KEY CONCEPTS (WHO):**
  - By the 2 step approach
  - By the clock
  - By the appropriate route
  - By the child
WHO analgesic ladder

• The key to pain management in children is the WHO Analgesic Ladder.
• The ladder consists of 2 steps, with the principle that you start with step 1 analgesics and if they do not control the child's pain you change to a step 2 analgesic.
The ‘2-Step Approach’

• New WHO Guidelines 2011
• Replaces the ‘WHO ladder’ for children’s pain
• Weak opioids not recommended in children
  – Codeine not well metabolised in some children
  – Tramadol not licensed for use in children and insufficient evidence
The step 2 approach

Step 1
NON-OPIOID +/- ADJUVANT*

Step 2
STRONG OPIOID + NON-OPIOID +/- ADJUVANT
# Dosing

<table>
<thead>
<tr>
<th>Type</th>
<th>Example</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-opioid</td>
<td>Paracetamol</td>
<td>10-15 mg/kg 4-6hrly</td>
</tr>
<tr>
<td></td>
<td>Ibuprofen</td>
<td>5 - 10mg/kg 6-8hrly (max 30mg/kg/day)</td>
</tr>
<tr>
<td>Strong opioid</td>
<td>Morphine</td>
<td>PO: 0.2 mg/kg 4hrly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IVI bolus: 0.1 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IVI infusion: 0.003 – 0.05 mg/kg/h</td>
</tr>
</tbody>
</table>
Step 2 - Opioid +/- Non-opioid +/- Adjuvants

• The most commonly used step 2 analgesics are:
• **Morphine Sulphate:**
  • there are different strengths available e.g. 5mg/5ml, 10mg/5ml, 20mg/5ml and 100mg/5ml.
  • 1-12months of age: 0.08-0.2mg/kg orally 4 hourly.
  • >12 months of age: 0.2-0.4mg/kg orally 4 hourly.
• **MST (Slow-release morphine):**
  • Long acting morphine - the dose is determined from the total 24 hour requirements
• **Fentanyl**
  • Available as patches - takes up to 24-48 hours to peak,
  • The dosage is based on the oral morphine dose equivalent per 24-hour total
  • The smallest fentanyl patch available for use in children is 12mcgm which corresponds to a total daily dose of 45mg of oral morphine. Patches take 12 hours to reach effective blood levels so other analgesia such as 4 hourly oral morphine should be continued for the first 12 hours.
• **Weak opioids** such as codeine phosphate are not recommended for use in children and should not be given at the same time as strong opioids such as morphine.
### Classification of analgesics

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<tbody>
<tr>
<td>Non-opioid</td>
<td>Paracetemol</td>
</tr>
<tr>
<td></td>
<td>NSAID’s</td>
</tr>
<tr>
<td>Weak opioid</td>
<td>Codeine</td>
</tr>
<tr>
<td></td>
<td>Tilidine (Valoron)</td>
</tr>
<tr>
<td></td>
<td>Tramadol</td>
</tr>
<tr>
<td>Strong opioid</td>
<td>Morphine</td>
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</table>
By the clock

- No PRN prescribing in chronic pain
- On a prn basis, children must experience pain first before they can get meds – fear that pain cannot be controlled worsens pain and anxiety
- Dosage intervals based on duration of action of drugs: 4HRLY for opioids
- Lower dosages of opioids ultimately used and smaller dose needed to prevent a recurrence of a controlled pain than to treat a new pain episode
- “Rescue dosages” for breakthrough pain
By the appropriate route

- PO - Use simplest, most effective route
- IMI – painful, avoid
- IVI – esp. to titrate strong opioids
- Subcut – easier than IVI
- Rectal – may be unpleasant
- Topical – EMLA
- Spinal/ epidural
By the child

• Need to adjust meds and dosages according to response and side-effects
• No one dose will be appropriate for every child
• Remember: strong opioids have no ceiling dose – titrate to response and side effects
The adjuvant analgesics

• Important in the management of pain
• Offer a multi-pronged approach to pain
• Enhance the effects of opioids
• Treat concurrent symptoms that exacerbate pain
• Provide independent analgesia
Site on action of analgesics and adjuvants

Figure 5.4  Primary sites of action of analgesics and adjuvant analgesics on peripheral nerves and the dorsal horn of the spinal cord

- Sodium-channel blockade
  - lidocaine
  - mexiletine
  - flecainide
  - carbamazepine
  - lamotrigine
  - phenytoin

- Enhanced descending inhibition
  - tricyclics
  - SSRIs
  - methadone
  - tramadol

- Activation of GABA inhibitory system
  - baclofen
  - benzodiazepines
  - valproate
  - vigabatrin
  - phenobarbital

- Inhibition of glutamate excitatory system
  - carbamazepine
  - lamotrigine
  - phenytoin
  - valproate
  - gabapentin
  - ketamine
  - methadone
  - dextromethorphan

a. drugs in italics act both peripherally and centrally. Drugs below the dotted lines are channel blockers at their respective receptor-channel complex.
The adjuvant analgesics

- Antidepressants
- Anticonvulsants
- Antispasmodics
- Muscle relaxants
- Anxiolytics
- Corticosteroids
Peripheral neuropathy

- Pain usually in legs/feet
- Due to
  - HIV itself and HAART
  - Post herpetic neuralgia
  - TB treatment
- Treatment
  - Change drugs
  - Amitriptyline usually first line
  - Carbamazepine
Pain in Oncology

- Headache - Prednisone 2 – 4 mg/kg/day
- Bone pain – NSAID’s, Steroids, Radiation
- Neuropathic – Opioids, Amitryptyline, Carbamazepine, Regional Anaesthetic Blocks
- Visceral – Antispasmodics, Opioids
Muscle spasm

• Paracetamol
• NSAID’s
• Baclofen
• Benzodiazepine – Rivotril (Clonazepam) or Valium (Diazepam)
Case study 1 - John

• John is 5 years old – 18 kg
• Fell from a tree and sustained an injury on his left arm.
• He is able to move the hand, but it is painful and swollen.
• How will you manage his pain?
Case 1 - John

- John is 5 years old
- 18 kg
- Fell from a tree and sustained an injury on his left forearm.
- He is able to move the hand, but it is painful and swollen.
- How will you manage his pain?

1) Reverse the reversible
2) Use Non-drug measures
3) Use Drug measures
   a) specific to the cause
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4) Associated psychosocial distress
Case 1: John

1) Reverse the reversible

2) Use Non-drug measures

3) Use Drug measures
   a) specific to the cause
   b) General

4) Associated psychosocial distress

- ?
- Splint, distraction
- Paracetamol 15mg/kg
  16kg x 15mg = 240mg = 10ml
  6 hourly
- Ibuprofen 5mg/kg =
  16kg x 5mg = 80mg = 4ml
  (100mg/5ml)
  6-8 Hourly
- Out of rugby team for 2 weeks, manage disappointment
Case 2 Chris

- Chris, 7 years old
- 12 kg
- Known HIV + on ARV’s
- Severe abdominal pain, due to TB abdomen.
- How will you manage his pain?
Case 2 - Chris

- Chris, 7 years old
- 12 kg
- Known HIV + on ARV’s
- Severe abdominal pain, due to TB abdomen.
- How will you manage his pain?

- **Paracetamol** 15mg x 12 kg = 180mg
  120mg/5ml
  7.5ml 6 hourly orally
- **Hyoscine butylbromide**
  5 to 10mg 3 x daily
  5mg/5ml
- **Morphine sulphate**
Morphine myths

- **Myth:** It will shorten the child’s life.
- **Truth:** Pain control does not shorten a child’s life, it only improves the child’s quality of life and brings comfort to a child’s death. It can even extend a child’s life because they are not exhausted from fighting pain.

- **Myth:** It will suppress a child’s breathing.
- **Truth:** Respiratory depression can be avoided by steady increases of dose.

- **Myth:** It will make the child nauseas.
- **Truth:** Nausea may occur in 25% of cases but will normally settle in 5-7 days.
Morphine myths

- **Myth:** It will make the child even more constipated.
  - **Truth:** Constipation must be prevented by the early use of prophylactic laxatives.

- **Myth:** They will develop addiction to it.
  - **Truth:** Addiction is not a problem encountered in paediatric palliative care.

- **Myth:** Sedation will affect the quality of the child’s life in the final days.
  - **Truth:** Sedation will normally improve within a few days of taking morphine.
Morphine facts

• Morphine uses (4 A’s)
  ✓ Analgesic
  ✓ Anti-diarrhoeal
  ✓ Anti-tussive
  ✓ Anaesthesia adjunct
Morphine facts

• Morphine is a versatile drug with no ceiling effect and no danger of accumulation (except with renal failure)

The dose
• The correct dose of morphine for an individual patient is that dose which is effective.

Possible routes
• po,pr,sc,ivi (imi- not for ppc)
• Morphine can be used at any stage of the disease to control pain and can be withdrawn if the child no longer needs it - therefore it is used for more than just end-of-life care.
Opioid side effects

Transient → Nausea
     Sedation

Ongoing → Constipation

Rare → Hyperactivity
       Myoclonus
       Pruritus
       Urinary Retention
Morphine sulphate

- Dosage = 0.2 mg/kg 4 hourly
- Strength = 100 mg/5ml
  - Or
  - 5mg/5ml
  - Or
  - 50mg/5ml
- Weight of child is 12 kg
- Calculate the dosage of this child using a strength of 5 mg/5ml
Morphine sulphate

• Dosage = 0.2 mg/kg
  4 hourly
• Strength = 5mg/5ml
• Weight of child is 12 kg
• Calculate the dosage of this child

- $0.2 \text{mg} \times 12 \text{kg} = 2.4 \text{mg}$
- $= 2.4\text{ml} \text{ 4 hourly PO}$
Morphine sulphate prescription

• Morphine sulphate (5mg/5ml) give 2.4 mg = 2.4ml 4 hourly PO x 5 days.
• For Break Through Pain 50% of dosage

Think about
• Laxative e.g. Lactulose 5 ml nocte PO
• Anti-emetic - Metoclopramide or Haloperidol
How would you increase this?

• Increase regular dose by 30 – 50% of previous dose
  – 2.4mg  2.4mg + 1.2mg = 3.6mg
  – 3.6mg  3.6mg + 1.8mg = 5.4mg
• After 24 hours add all breakthrough doses and all regular doses and divide by 6 to work out the new regular 4 hourly dose
• If breakthrough dose is required < 1 hour after regular dose then the regular dose needs to be increased
Terminal pain control

- Oral morphine
- Sustained release morphine
- Syringe driver – subcutaneous morphine
Sustained release morphine

• Given as 12 hourly dose orally
• Add total daily mg of morphine used if pain is controlled and divide by 2
• E.g. 2.4 mg x 6 dosages + 1.2 mg x 3 (BTD)
  = 14.4 mg + 3.6 mg = 18 mg total daily dose
• Only 10, 30, 60 and 100 mg tabs
• Therefore give 10 mg 12 hourly PO (rounding up)
Terminal pain control with syringe driver

- Oral to subcutaneous
- Total daily oral dose / 2
- Dilute this amount with normal saline to fill 48 mm of the syringe.
- Set syringe at 2mm/hour
Alternatives to morphine

• Hydromorphone:
  – 7x potency of morphine

• Fentanyl: available as patches (72 h)
  – takes up to 24-48 hours to peak

• Diamorphine
  – More soluble than morphine

• Methadone:
  – Possibly more effective for neuropathic pain
Procedural pain

• **Goal**: children to be happy and secure before and after the procedure
• “Needle phobia”: **20% of Adults** have moderate-intense fear of needles, blood
• Fear triggers anxiety, fainting, shock
• Avoidance of further treatment
How to deal with procedural pain

• Preparing the environment:
  • Safe, friendly
• Preparing the adult:
  • Help to calm and distract child, age appropriate info.
• Preparing the child:
  • Topical anaesthetic
  • Allow age appropriate choices
  • Be honest about pain
  • Cognitive e.g. explanation.
  • Distraction e.g. sing song, tell story
  • Relaxation
How to relieve fear

Give control

− Explain what is happening
− Discuss options
− Seek and answer questions

Non-pharmacological Rx

− Blowing bubbles, progressive relaxation, aromatherapy/massage, play/distraction