Paediatric pain management in general practice

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Abstract

Pain is a subjective symptom which is particularly difficult to assess and manage in children. Often, this leads to the underestimation of pain severity in young children. Poorly managed pain can have a long-term impact on the developing child. It's important to be familiar with pain assessment tools to quantify childhood pain and the treatment options which are dependent on the degree of pain. As a general practitioner, it is essential to be familiar with the assessment and treatment of pain in children of all ages.

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Introduction

Few studies reliably document the prevalence of pain in children. Research on the neurobiology of pain in early development has shown that infants and children of all ages have the capacity to perceive pain.[1] Any experience that causes pain in adults does the same in infants and children, even if they can't express it.[2]

Some research suggests that, because of a more robust inflammatory response and the lack of a central inhibitory influence, infants and young children may actually experience a greater neural response, i.e. more pain sensation and pain-related distress following a noxious stimulus than adults.[3]

In addition, the impact of pain on the young nervous system has significant long-term effects, including a lowered pain tolerance for months after a pain-producing event.[3] Pain experienced very early in life may influence the nociceptive processing for the rest of a child's life.[1,2]

Undertreating pain in children

The American Academy of Paediatrics and the American Pain Society have issued a joint statement recommending that pain should be recognised and treated more aggressively in children.

They point to several misconceptions that can lead to undertreatment of pain in children: [4]

- The myth that infants and children do not feel pain, or suffer less from it than adults.
- Lack of routine pain assessment in children.
- Lack of knowledge regarding newer modalities and proper dosing strategies for the use of analgesics in children.
- Fears of respiratory depression or other adverse analgesic medication effects.
- The belief that preventing pain in children takes too much time and effort.

Types of pain in children

Paediatric pain is commonly dealt with in general practice and includes:

- *Everyday pain*: Minor bumps and bruises are very common in children in the course of active play and sport. While they may not be medically significant, each episode adds to the child's learning experience of how to cope with pain.[2]
- *Short-term pain that lasts minutes, hours, or days*: Common childhood illnesses, trauma, or medical procedures such as immunisations, blood tests and surgery can be especially painful in children as they are generally unable to either refuse or rationalise painful experiences.[2,5]
- *Recurrent pain in childhood*: Many children experience pain that arises from emotional and physical experiences. Stomach aches, headaches, limb pain ("growing pains"), and chest or back pain are experienced frequently by up to 30% of children.[6] This relatively minor recurrent pain may interfere with school and family life, and cause emotional and financial stress. Since no "real" cause can be found, this pain tends to be underestimated.[2]
- *Disease-related and chronic pain*: Pain is the initial symptom of many childhood diseases. Many children live with severe ongoing pain from conditions like cancer, malaria, human immunodeficiency virus, rheumatological disorders and sickle cell disease.[2]

Pain measurement in children

Children have a limited range of experience and may be unable to use words that adequately express their discomfort. This makes pain assessment in children more challenging than in adults.[7]

In addition, children use many coping strategies to deal with pain, including play and sleep. This can be misleading, as such strategies can incorrectly be interpreted as signs of a lack of pain. It's important that children find ways in which to express their pain. Adults need to understand that children may not disclose the severity of the pain. This could be due to fear of further pain as a result of their disclosure, i.e. injections.[2]

Children who are as young as two years old can report pain, but they may not be able to accurately rate its severity.[8] When questioning a child about his or her pain, it's important to do so using words to which the child can relate, i.e. "Do you have any hurt?" or "Is there an 'owie' or 'boo-boo' in your tummy?" Liaise with the child's parents when assessing the child's pain. Children will often deny that they feel pain when asked by a stranger.[8]

Assessment of children older than three years

Specific self-reporting tools can be used to measure pain in children who are able to express themselves (usually three years and older).

These include:

- *Faces pain scale*: Usually, visual analogue scales depicting expressions of increasing pain can be used by children who are three years and older. The reliability of pain assessment increases with age and the cognitive ability of the child. The Faces pain scale, as seen in Figure 1, can be converted to a numeric scale in order to classify pain as "mild", "moderate" or "severe".[9,10]
- *Numeric rating scale*: Usually, the rating of pain from 0-10 (10 being the worst possible pain imaginable) can be used by children who are eight years or older.[10]
- *Specific self-reporting*: In general, adolescents can provide a more accurate measurement of pain, using both a numeric rating scale, as well as other, more specific pain descriptions, e.g. explaining if the pain is sharp, stabbing, dull, burning or tingling.[10]

Assessment of children younger than three years

Children who are younger than three years old, or who are unable to express themselves, require the use of observational tools to assess their pain.

These pain scales are based upon scoring facial expressions, the ability to be consoled, the level of interaction, limb and trunk motor responses and verbal responses.

They include:

- *Revised Face, Legs, Activity, Cry, Consolability (r-FLACC) tool*: This tool is useful for nonverbal children. The r-FLACC is a behavioural scale that has been validated for assessment of postoperative pain in children between the ages of two months and seven years. After observing a child for 1-5 minutes, a pain score is obtained by reviewing the descriptions of behaviour and selecting the number that most closely matches the observed behavior, as shown in Table I.[7,10]
- *Other pain measurement tools:* Other pain measurement tools for nonverbal children include the Non-Communicating Children's Pain Checklist-Postoperative Version (NCCPC-PV), Nursing Assessment of Pain Intensity (NAPI) (newborn to 16 years of age), Paediatric Pain Profile (newborn and infants) and the Individualized Numeric Rating Scale.[10] No single nonverbal assessment tool has been rated above any other, although in a study that compared the r-FLACC, NCCPC-PV, and NAPI assessment, the r-FLACC received the highest clinical utility score.[10]

It is important to adopt an assessment tool and to use it methodically when assessing paediatric pain. Studies have shown that observational assessment of pain underestimates pain compared to self-reporting in older children. Therefore, it is likely that observational scores may underestimate the experience of pain in nonverbal children, infants and neonates.[11]

Approach to pain management

The main goals of paediatric pain management are to reduce, control and prevent pain in children. Management varies depending upon the type, source, severity and

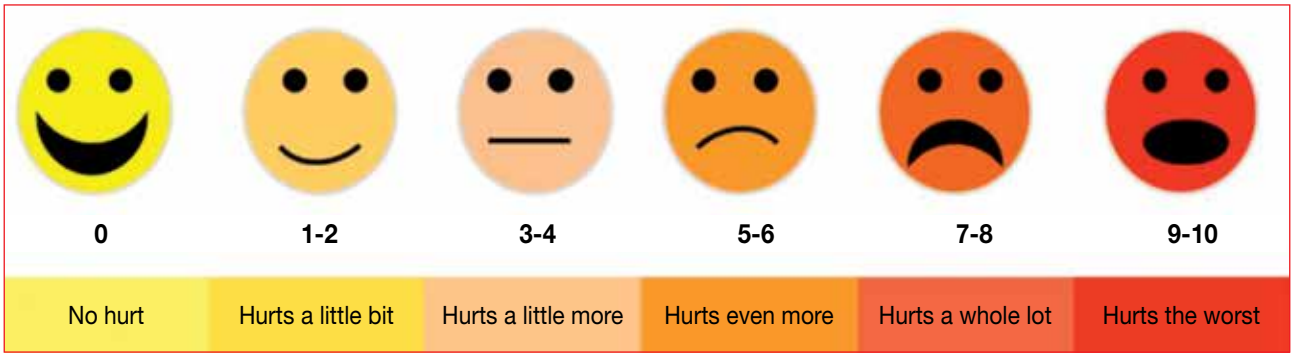

Figure 1: Faces pain scale[9]

Table I: Revised Face, Legs, Activity, Cry, Consolability Behavioural Pain Assessment Tool (r-FLACC)[7]

Categories	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent-to-constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs up withdrawn
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No crying (awake or asleep)	Moans and whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractable	Difficulty to console or comfort

Each of the five categories is scored from 0-2, resulting in a total score between 0-10

duration of the pain. In some cases, treating the underlying source of pain or other related symptoms, such as distress or anxiety, can relieve the symptoms. Even if specific therapy is available to treat the source of pain, it is important to provide adequate therapy to relieve any pain and suffering.[10] Pain management in children includes both pharmacological and nonpharmacological measures.

Pharmacological therapy

Pain management in children should be based on the World Health Organization (WHO) analgesic ladder (shown in Figure 2). This provides a stepwise approach to therapy according to the pain severity experienced by the patient.[12,13]

Although the WHO analgesic ladder was originally developed for children with cancer, it can be applied to any child with pain.

The WHO guidelines for pain relief recommend the following:[12]

- Regular assessment of pain and its severity throughout the course of the treatment.
- Administration of analgesic therapy for moderate and severe pain over a 24-hour period, including sufficient analgesia to allow the child to sleep through the night.
- If possible, the use of oral analgesics is preferable to other painful routes of administration.
- Anticipation and treatment of analgesic side-effects.

The choice of analgesic is dependent upon the pain intensity and the child's response to previously administered agents.

The WHO analgesic ladder provides the following guidelines when selecting analgesic agents.

Mild pain

Paracetamol is considered to be the safest first-line choice for mild pain and fever in children from one month of age and older. Paracetamol acts directly on the central nervous system to target pain and fever. It is effective within a 30-minute time period and lasts up to six hours.[14] The recommended dosage is up to 20 mg/kg/dose six hourly, rectally or orally, to a maximum of 90 mg/kg/24 hours.[3,15]

Anti-inflammatories, used either alone or in combination with paracetamol, are considered to be the second step in mild-to-moderate pain relief. Diclofenac can be used in

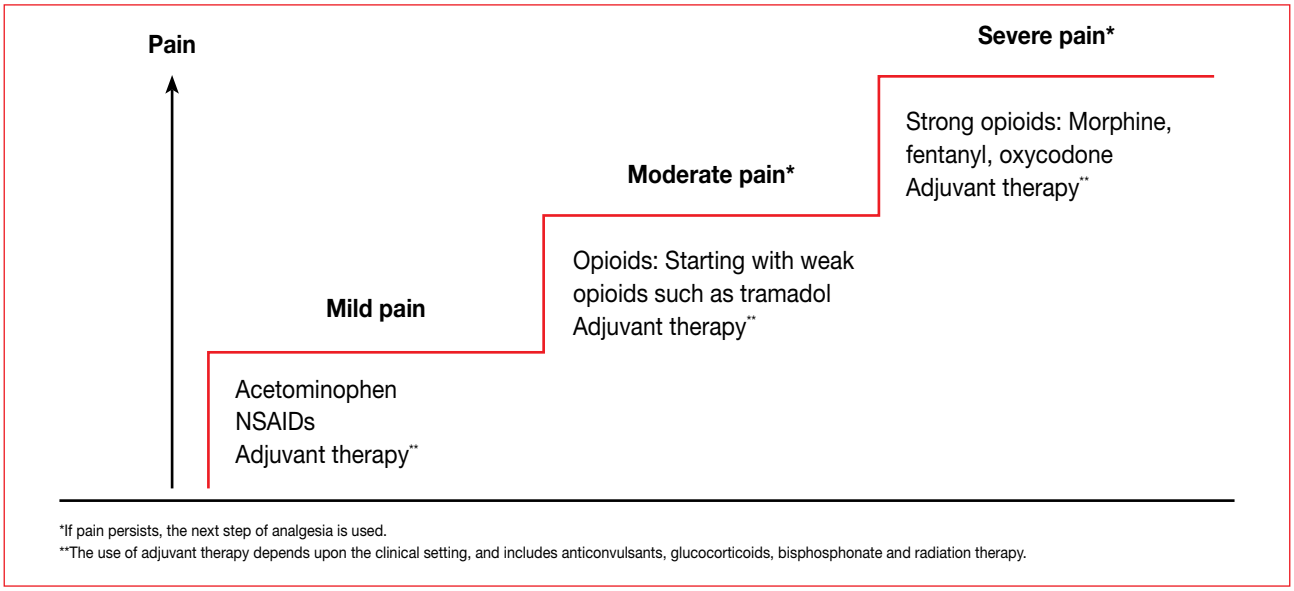

Figure 2: World Health Organization analgesic ladder[12]

children who are two years or older, up to a maximum of 1 mg/kg/day, either as a rectal suppository or orally.[10,15] Ibuprofen can be used in children over six months of age, up to a maximum of 20 mg/kg/day.[10,15]

Moderate pain

Weak opioids, such as tramadol, are recommended to provide stronger pain relief. Tramadol functions centrally to inhibit norepinephrine and serotonin reuptake and has a weak affinity for the mu-opiate receptors. As a result, it has a weaker analgesic effect, and is less likely to be associated with respiratory depression than other stronger opioid preparations.[10] The oral dose of tramadol in children is 1-2 mg/kg every four to six hours, with a maximum dose of 400 mg per day. Tramadol is more effective than codeine in children. It is the preferred agent.[16]

Severe pain

Severe pain requires strong opioids, such as morphine, hydromorphone or fentanyl.[10]

Opioid treatment in children is best managed by a paediatrician or pain management specialist, since tailoring of therapy requires finding the balance between the optimal dose for pain relief, while limiting serious side-effects, e.g. respiratory depression.[10]

In general, short-acting agents should be prescribed every four hours, together with an additional agent for breakthrough pain.[10]

The dose of opioids can be increased by 25-50% per day, until adequate analgesia is obtained or intolerable side-effects occur.[10]

Adjuvant therapy can be used as necessary at any point on the analgesic ladder. This includes anticonvulsants for neuropathic pain and antidepressants or anxiolytics for coexisting mood disturbances.[10]

Nonpharmacological therapy

Nonpharmacological approaches for the treatment of pain in children include psychological strategies, education and parental support. Cognitive-behavioural therapy interventions, which decrease anxiety and distress, can be quite effective[17] in children who are undergoing repeated painful procedures.

The aim of such therapies is to provide responses that may help children master a distressing situation, ideally in a manner that is consistent with their basic coping strategies. Most of these techniques take time to learn and master, so simple distraction techniques that divert attention away from painful stimuli, or positive incentive techniques which provide a small reward (e.g. stickers or prizes) for attempts at mastery of their responses, can be effective in children who are undergoing occasional procedures.[10]

These techniques are designed to decrease anxiety, but are not adequate as the sole means of treating pain relief during painful procedures.[18]

In addition to the above, if a child has to undergo a painful procedure, e.g. taking blood, steps should be taken to reduce the anxiety associated with the procedure. Prior to the intervention, the child should be prepared by being given a description of the various steps in the procedure. The procedure should be performed in a quiet, calm environment. Practised cognitive-behavioural interventions should be employed to reduce distress and anxiety.[10]

Paediatrics, pain and general practice

Paediatric pain is a common and underestimated condition, as focus is often placed on the pain which patients can verbalise. Assessing and managing pain in children, particularly in those who are too young to provide a subjective assessment of their pain, should be routinely carried out using objective scoring methods. Adequate analgesia should form part of any paediatric treatment and should be reassessed at every consultation.

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