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Developmental and Cultural Perspectives on Children's Postoperative Pain Management at Home

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Developmental and Cultural Perspectives on Children's Postoperative Pain Management at Home

Keywords: postoperative pain, pediatric, developmental, cultural, parent management

Abstract

Outpatient surgery is extremely common in children, and approximately 4 million children experience significant pain after surgery in the United States each year. Management of children's postoperative pain in the home setting is suboptimal and is impacted by characteristics of children and parents, as well as the larger family and cultural context. In particular, developmental status of the child, parental beliefs regarding pain expression and analgesic use in children, cultural values, and language barriers can affect management of children's postoperative pain. Targeting the myriad barriers to children's pain management by capitalizing upon the use of tailored interventions may help bridge the gap between the translation of pain management guidelines to the home setting.

Pain is a universal experience that is affected by biological and psychosocial factors. As defined by the International Association for the Study of Pain, "pain is… an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" [1]. Included in the experience of pain are myriad psychosocial factors that are widely accepted to influence the experience and expression of pain, including race/ethnicity,

culture, development, and the family environment [2,3]. Accordingly, pain often presents a dilemma to the treating health care provider given the complexity of its experience.

Postoperative pain is extremely common in children. Each year millions of children in the United States undergo surgery, [4] many of whom experience significant amounts of postoperative pain [5]. Pain continues to be prevalent upon discharge home; in fact, our group and others have documented that approximately 80% of children report immediate postoperative pain at home and up to half continue to experience pain one week following surgery [6,7]. The under treatment of pain in the postoperative setting is particularly problematic given the impact of children's pain experiences. Specifically, children may experience maladaptive behavioral changes, increased analgesic requirements, and delayed postoperative recovery due to pain [8]. Furthermore, postoperative pain is a strong predictor of unanticipated hospitalization [9], the development of chronic pain [10], and greater sensitivity toward pain in the future [11]. Moreover, early exposure to pain has been associated years later to adults' reports of increased pain and anxiety during medical events [12]. Recent findings have even demonstrated alterations in pain neuropathways as a result of activation of the nociceptive system early in development [13]. Accordingly, it is vital to provide optimal pain management in children after surgery in an effort to prevent negative sequelae.

Practice Point

- Postoperative pain in children is extremely common and is under treated in the home setting

Parent Management of Child Pain

Changes in health care have led to a transition of children's surgeries to be conducted primarily on an outpatient basis [14]. Accordingly, parents are becoming increasingly responsible

for management of children's postoperative pain. Unfortunately, a growing body of literature indicates that parents tend to provide suboptimal postoperative pain management. For example, research by our group confirms that children experience high levels of pain following one of the most common pediatric surgeries, tonsillectomy and adenoidectomy (T&A), yet parents provide very few doses of analgesics in the home setting [6]. Additional research illustrates that families may fail to adhere to recommendations for administration of analgesia from their health care providers, but not necessarily because their children are not experiencing pain [15–19]. For example, the majority of parents provide fewer than the prescribed number of analgesic doses to children [15,16,19]. Furthermore, out of the doses that parents do administer to children, the overwhelming majority (70%) are sub-therapeutic. Parents may also substitute weaker medications than those prescribed, or stretch the time interval between analgesic doses [15–19].

The reasons behind parental under treatment of children's postoperative pain are not entirely clear. Managing child postoperative pain may be difficult due to a number of reasons including child factors, such as fatigue from sleep disturbances due to surgery [20], medication factors, such as inadequate medication strength, system factors, such as lack of instruction on how to administer medication, and parental factors, such as attitudes towards medication [21]. Examining parental factors, our group and others have established a link between parental misconceptions regarding analgesic use and pain expression in children and administration of pain medication in the home setting. Data from our research center have documented that parents endorse many misconceptions about using analgesia with children, such as beliefs that pain medication works best the less often it is used and analgesia should only be used when pain is severe [22]. Parents also report fears of side effects and addiction potential and therefore, may withhold medication from their children. These misconceptions have also been empirically connected to the under treatment of children's

pain by parents. Specifically, our group has shown that the more parents endorse misconceptions regarding analgesic use for children, the fewer doses administered to children after surgery [23]. Moreover, we have also documented that parents may misunderstand the myriad ways that children can express pain. For example, many parents report that "Children always express pain by crying or whining," "Children complain about pain to get attention," and "Children who are quiet are not in pain" [22]. Thus, parents who are not able to detect pain will likely be unable to optimally treat pain. These misconceptions about medication and the lack of pain detection by parents are important as medication is only effective when used.

The Parents Postoperative Pain Measure (PPPM) [24] is one tool that may be helpful in allowing parents to detect child pain. The PPPM is a 15 item checklist of behaviors indicative of postoperative pain (e.g., whining, refusing to eat, holding the sore part of his/her body, etc.). This measure can be used by parents to assess their child's pain by looking for the occurrence of these behaviors. Further, this measure also reflects behavioral indices of recovery. Because of the utility of the measure and because it is the only validated measure of parent report of child postoperative pain, the PPPM has been used in many studies [6–8].

In addition to using tools to assess pain, parents play a vital role in reducing children's pain through behavioral strategies. For example, Taddio and colleagues [25] have reviewed and graded several guidelines for pain management based on empirical evidence. In particular, such guidelines highlight parental use of distraction and coaching (e.g., encouraging child use of coping skills) as effective parent behavioral pain management techniques for acute pain in children.

Practice Point

- Interventions based on empirical findings may be an avenue to improve the management of children's postoperative pain in the home setting

Developmental Factors in Pain

Developmental stages play a pivotal role in how a child's pain is managed. Frequencies of vocal expressions of pain such as crying, wailing, ingressive vocalization appear in children experiencing postoperative pain but specific rates of occurrence of these expressions change as children age and develop [26]. Verbal expressions often make assessing child pain easier compared to other vocalizations. When children are unable to express their pain verbally, health care provider and parental assessment of child pain is more challenging as adults cannot simply ask children about their discomfort. Given that self-report is considered the gold standard of pain management, lack of ability to verbally report, either due to age or developmental delay/cognitive impairment can provide challenges for the optimal management of postoperative pain.

Although pain assessment in non-verbal children can be difficult, validated observational tools have been developed in order to assess pain in this population. For young children, the Neonatal Infant Pain Scale (used for infants) [27] and the Face, Legs, Activity, Cry, and Consolability (FLACC) scale (used for children under 4) [28] each provide observers with a checklist to assess pain-related behaviors. For children slightly older but who are still not verbally fluent, self-assessment pain measures through the use of scales such as the Faces Pain Scale-Revised (used for children aged 4 to 12) [29] and Wong-Baker FACES (used for children 3 and older) [30] are helpful. These scales allow children to point to their level of pain depicted through faces. Additionally, the Visual Analog Scale allows children over the age of 7 to point to their level of pain on a line 100 mm long with one end representing "no pain" and the other representing "worst pain" [31].

Observational measures can also be adapted for children with cognitive disabilities. If a child's verbal ability if impaired, self-report non-verbal measures or observational measures can

be used. For example, the Noncommunicating Children's Pain Checklist, an observational measure, and the FLACC have both been utilized to assess pain in children with disabilities [32–34].

In addition to determining verbal ability, the age of a child may impact the expression and management of pain. For example, older children have more resources in terms of coping strategies to handle their pain compared to younger children [35]. Specifically, older children are better at describing their pain and using cognitive pain management skills. Older children are also better at distinguishing between their distressful states by identifying differences between fear and physical pain [36]. It is therefore not surprising that older children develop fewer behavioral problems after surgery compared to younger children [37]. For these reasons, the age of a child plays a large role in the course of their postoperative pain and implies that observational tools should be used as complements to self-report measures of pain in younger children.

Cultural Factors in Pain

It is widely accepted that cultural variables can influence the expression and treatment of pain and, in fact, there is a growing body of ethnic and racial disparities in pain management [38,39]. Such disparities have been documented in the experience of postoperative pain in children. For example, examining differences in postoperative recovery, African American children were shown to have higher pain scores and require more pain medication compared to White children [40]. In addition, White children experienced more analgesic side effects compared to African American children. Our group has a growing body of evidence on cultural factors that impact management of children's postoperative pain. Specifically, findings from our lab suggest ethnic and language differences in parental beliefs about children's pain expression, suggesting that

Spanish speaking parents report misconceptions to a greater degree than English speaking parents, even after controlling for group differences in socioeconomic status [41].

Language is another factor that can influence management of children's postoperative pain. For example, language barriers may lead to parents not fully understanding pain management instructions of health care providers and such barriers have been shown to be associated with low treatment adherence [42]. Moreover, there may be cultural preferences for use of complementary and alternative medicine (CAM) in addition to or in place of traditional pain management strategies [43], and data do support differences in CAM use based upon language. Our lab has documented that both English speaking mothers are more likely to use complementary and alternative medicine to treat child pain compared to Spanish speaking mothers [44]. These differences were not associated with mothers' beliefs about CAM, nonetheless, such cultural beliefs should be explored further with more culturally sensitive measures of CAM attitudes.

Although ethnic disparities in children's pain management exist, we cannot fully tease apart the role of cultural values and socioeconomic factors. It is possible that values and beliefs are shaped by culture which in turn affects outcomes in pain management [45]. It is also possible that these differences could relate to socioeconomic status. For example, education may impact parent understanding of pain management and willingness to administer medication to children. It is likely that the disparities are a function of the more complex interplay of culture and SES and future research to more clearly identify the relationship among these variables is needed.

Practice Point

- Pain management is impacted by parent beliefs regarding analgesic use for children, developmental and language status of children, and cultural and language factors

Best Practice

Assessment is key in adequately treating pain; therefore, ensuring that parents and caregivers can conduct proper assessment of children's postoperative pain at home is imperative. Educating parents on the use of validated pain scales and ensuring parents understand the various ways pain can be expressed by children (e.g., verbal distress, withdrawal, behavioral changes) can help parents detect when children may be in pain but are unable to directly express their discomfort. Avoiding assumptions regarding parent understanding of appropriate analgesic administration is vital. Given that analgesics are weight based and require proper measurement, teaching parents how to administer analgesics is crucial. The media recently reported on the issue of parental confusion regarding administration of liquid analgesics to children and how the "old school" method of using a teaspoon can lead to errors in dosing. Moreover, parents may not know the differences or similarities in the variety of brand and generic medication names – we frequently encounter parents in our setting who are unaware that ibuprofen, Advil, and Motrin are all the same analgesic, for example. In terms of dosing, it has long been proposed that optimal management of children's postoperative pain ought to include around-the-clock dosing of analgesics to prevent pain. We teach parents that it takes more medication to treat pain that has become severe than it does to prevent pain. Finally, pain is best treated using a multimodal approach – that is, combining pharmacological and nonpharmacological pain management strategies. Behavioral strategies, such as distraction, imagery, relaxation can positively impact children's acute pain when used in conjunction with analgesics.

Practice Point

- Proper pain assessment, around-the-clock dosing, and a multimodal approach are essential for the optimal management of children's postoperative pain

Conclusion and Future Perspective

Postoperative pain in children remains as a significant problem, particularly given that the majority of postoperative pain management occurs at home under the responsibility of parents and caregivers. A large body of research indicates parents provide suboptimal pain management in the home setting, which may relate to parental beliefs regarding analgesic use and pain expression in children. Developmental and cultural issues can also contribute to challenges in children's pain management. A child's developmental state due to age or ability affects pain expression. Similarly, a child's ability to cope with pain depends on age and maturity level. Cultural issues including ethnicity, language, and socioeconomic status play a role in pain management as well. Accordingly, research in the areas of parental, developmental, and cultural issues in children's postoperative pain management suggest that a tailored, rather than a "one size fits all" approach is needed. Tailored interventions target specific populations and eliminate extraneous information so that information provided is directly relevant, and therefore, more likely to be effective [46]. Such interventions can be modified accordingly to children's age, parental beliefs, cultural values, and any other factors empirically associated with children's pain management after surgery. Development of tailored interventions for children's postoperative pain may provide a fruitful avenue for improving children's pain management in the home setting.

Children's pain management has long been neglected in both clinical and research settings; however, we have seen a dramatic increase in the focus on this topic in recent decades. Children's pain management in the medical setting has greatly improved, particularly given the increased focus on pain as the "fifth vital sign." We also have available a wealth of knowledge on children's pain management via well-established and evidence-based guidelines, such as Practice Guidelines for Acute Pain Management in the Perioperative Setting published by the American Society of Anesthesiologists Task Force on Acute Pain Management [47]. However, there is a huge gap in

the translation of knowledge into practice, particularly with pain management in the home setting. Given the increased focus on children's pain management in the home setting and the incorporation of health information technology into the treatment of pain, it is expected that we would see significant improvements in the management of postoperative pain in children in the home setting in the next 5-10 years. In the next several years we anticipate a growing number of studies reflecting development of tailored interventions to target pain in this area that capitalize on the Internet to provide ongoing access to strategies by parents to provide optimal treatment to children. In addition, given the growing use of ecological momentary assessment strategies such as pain diaries, health care providers are increasingly provided with real time data on pain, which allows for provision of real time intervention to prevent increases in pain severity. Therefore, we hope to see a decrease in unnecessary suffering in children following surgery in the next decade.

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