Pain following pediatric tonsillectomy and adenoidectomy: What do we know about home pain management?

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More than a decade has passed since mothers described their pain management interventions for their children’s postoperative tonsillectomy and adenoidectomy (T & A) care as “trial and error” (Gedaly-Duff & Ziebarth, 1994). The purpose of this commentary is to explore the state of the science of pediatric home pain management following T & A and to reflect upon directions for future research.

Pediatric T & A postoperative home pain experiences

Foundational research about pediatric home pain following T & A was built from parental reports of their child’s pain (Gedaly-Duff & Ziebarth, 1994; Finley et al., 1996; Sutters & Miaskowski, 1997; Homer et al., 2001; Hamers & Abu-Saad, 2002). Finley et al. (1996) reported that children following T & A had significant pain, but 42% of their parents felt pain medication should be administered only as a last resort. Other researchers (Warnock & Lander, 1998; Seid & Varni, 1999; Helgadóttir & Wilson, 2004; Sutters et al., 2004, 2007; Idvall et al., 2005; Wiggins & Foster, 2007) used children’s pain intensity self-reports to confirm the severity of postoperative T & A pain.

The experience of T & A postoperative pain includes moderate to severe throat pain which continues for 3 to 5 days. In addition to throat pain, children may also experience ear pain by the fourth day. T & A postoperative pain lasts from 7 days to 2 weeks with a gradual decline in intensity until only swallowing pain exists (Gedaly-Duff & Ziebarth, 1994; Helgadóttir & Wilson, 2004; Sutters et al., 2004; Warnock & Lander, 1998; Wiggins & Foster, 2007).

Child self-reports and parental proxy reports of pain may not give a full description of the concerns. During home recovery following T & A, children were asked to use a body outline (Savedra et al., 1989; Van Cleve & Savedra, 1993) to map their pain. Children marked throat and additional pain sites including: headache, stomachache, tongue soreness, and chapped lips (Wiggins & Foster, 2007). In this same study children expressed concern that they were unable to breathe due to tongue and throat swelling and that they felt exhausted due to night time sleep disruptions. Furthermore, these symptoms were frightening for the children.

Symptoms associated with T & A home pain and recovery

Inadequate symptom management at home makes recovery difficult for children. Approximately 30% of children reported nausea and vomiting during home recovery (Sutters et al., 2004; Huth & Broome, 2007; Wiggins & Foster, 2007). The lack of fluid intake, in addition to nausea and vomiting, increased the risk for dehydration in these same children (Sutters et al., 2004; Huth & Broome, 2007; Wiggins & Foster, 2007). Children, who had
higher pain intensity experiences, also described more unpleasant symptoms than children who reported less pain (Sutters & Miaskowski, 1997; Helgadóttir & Wilson, 2004). Higher levels of preoperative anxiety in children (5-12 years of age) are associated with more postoperative pain and behavioral problems (Kain et al., 2006). Families whose children have T & A for chronic sleep disordered breathing have concerns about apnea and behavioral problems during recovery (Mitchell, 2007; Wei et al., 2007). Parents report difficulty knowing how to respond to these symptoms (Gedaly-Duff & Ziebarth, 1994; Seid & Varni, 1999).

**Family interventions used for T & A at home**

Family administration of analgesics is an essential home care intervention. Research has documented that children at home following T & A are administered only about 50% of their prescribed analgesics (Helgadóttir & Wilson, 2004; Wiggins & Foster, 2007). It is unclear why parents do not consistently administer pain medication even in the presence of the child’s report of severe pain (Sutters & Miaskowski, 1997; Hamers & Abu-Saad, 2002). Parents may underestimate the severity of the child’s pain report (Singer et al., 2002). Parents have described concerns about analgesic over-medication and fears of narcotic addiction (Gedaly-Duff & Ziebarth, 1994; Finley et al., 1996; Kankkunen et al., 2003a; Helgadóttir & Wilson, 2004; Idvall et al., 2005).

Parental concerns about analgesic administration may be related to the child’s refusal to swallow. Pain intensity with swallowing and without swallowing was compared, with children rating both as moderate to severe during the early postoperative days (Sutters et al., 2004). Researchers suggested that they were uncertain if children were unable to distinguish the differences in pain intensity during the early postoperative period or if swallowing liquids does not contribute to increased pain (Sutters et al., 2004). Liquid analgesics such as acetaminophen with codeine have been associated with side effects such as stomach pain, nausea, and vomiting (Sutters et al., 2005). Children may refuse pain medication if they have experienced unpleasant side effects. Clearly there are multiple factors that should be considered when designing interventions that will improve analgesic administration.

Furthermore, parents may believe that ambulatory surgery would not contribute to severe pain. Educating parents to recognize the importance of using their child’s pain intensity report as an indicator of how to intervene is essential for effective management. Although young children from 3 to 7 years of age and children with cognitive or developmental delays may have difficulty giving accurate self-report (American Pain Society, 2006), parents can be taught to assess pediatric pain using multiple indicators. The Parents’ Postoperative Pain Measure (PPPM) is an objective pain assessment tool. This tool uses behavioral measures of child distress rather than subjective estimates of pain intensity (Chambers et al., 1996; Finley et al., 2003).

Family attitudes remain an obstacle to decision-making even though pain assessment tools facilitate pain identification (Forward et al., 1996). Seid and Varni (1999) developed an algorithm intervention to assist parents with decision-making. This algorithm was designed so the parent would administer analgesics appropriate for the child’s pain intensity score. Although children in the algorithm intervention returned to school sooner, parents reported it was difficult to use the algorithm for more than a few days. In an educational intervention, parents who read a pamphlet about pediatric pain management were shown to have a more positive attitude toward the use of analgesics (Chambers et al., 1997). However, this same intervention did not change parental behaviors toward offering analgesia more frequently. Huth and Broome (2007) described the need for multimodal teaching at discharge from hospital to improve family home pain management.

**Pharmacological interventions**

It remains a challenge to identify the best analgesic for home pain management. Over the past decade, analgesic research related to T & A home care has explored the use of plain acetaminophen and opioid/acetaminophen combinations. There is not clear evidence about the type of analgesic or dosage frequency that is most effective for home T
& A pain relief (Hamunen & Kontinen, 2005). Plain acetaminophen in usual or higher (90 mg/kg/24 hr) dosages does not adequately reduce pain during the early postoperative period (Rømsing et al., 1998, 2000). Night and early morning awakenings at home are related to breakthrough pain resulting from a decline in analgesic administration during night time sleep (Hamers & Abu-Saad, 2002; Helgadóttir & Wilson, 2004; Wiggins & Foster, 2007). Although around the clock (ATC) administration of pain medication has been effective for breakthrough pain (McClain, 2006), parents are often reluctant to awaken sleeping children for night time analgesic administration.

Sutters et al. (2004) developed a randomized clinical trial (RCT) for postoperative T & A home pain management that included experimental groups assigned to ATC analgesia and a control group assigned to as needed (PRN) analgesia. Children assigned to the ATC intervention groups were administered more analgesics, however, the ATC intervention did not show a statistically significant reduction in pain intensity when compared with the PRN controls. Researchers compared analgesic side effects between ATC and PRN groups from the same RCT and noted no group differences in the side effects (Sutters et al., 2005). Francis-Baldesari et al. (2007) have developed a Cochrane review protocol for analgesia for pediatric postoperative pain following T & A. Upon completion, this evidenced-based review will offer insight into the current analgesic management of T & A home pain in children.

Preoperative preparation has decreased anxiety in children and parents prior to the ambulatory surgery experience (Huth et al., 2004; McEwen et al., 2007). In addition, new surgical interventions for tonsil removal such as coblation (Chang, 2005) and tonsillotomy with radiofrequency techniques (Hultcrantz & Ericsson, 2004) demonstrate less postoperative pain and shorter recovery time than the traditional tonsillectomy with electrocautery. Thus there has been progress with pre- and intra-operative interventions to reduce anxiety and recovery time in the surgical setting.

Non-pharmacological pain interventions
Non-pharmacological interventions should be used in conjunction with medications to improve pain management (American Pain Society, 2006). Children described that interventions such as family presence, pets, games, movies, and music were comforting during home recovery (Kankkunen et al., 2003b; Wiggins & Foster, 2007). In contrast, formal cognitive-behavioral interventions for T & A pain such as imagery had more successful application in the ambulatory setting than in the home (Huth et al., 2004). There is a need to develop more RCTs which explore how non-pharmacological pain interventions can be implemented in the home.

Future directions
Pediatric postoperative home care can no longer be described as “trial and error”. Research efforts have included RCTs that have promise for outcome improvement (Seid & Varni, 1999; Huth et al., 2004; Sutters et al., 2004, 2005). Future research related to pediatric T & A home recovery should include attention to design and method issues. These issues include: designing intervention studies with adequate power to find significant differences; reporting home recovery parameters specific to age, surgical procedure, and type of analgesia used; and using methods that facilitate data collection in the home environment. Statistical methods such as hierarchical linear modeling and instruments such as electronic diaries can be used to manage some of the difficulties of data collection in the home environment. Pain interventions must be designed to meet the unique postoperative concerns of family-centered pediatric T & A care in the home.

Researchers and health care providers need to collaborate to establish sound educational interventions that are designed to improve: assessment and decision-making related to pain and symptom management; recognition of the difference between analgesic side effects and postoperative complications; prevention of breakthrough pain; and application of non-pharmacological interventions. In light of parental beliefs about analgesics and continuing reports of unrelenting pain and symptom experiences during home care, research efforts must give attention to
the timing and method of delivery of family education. Developing innovative, evidence-based pain management interventions that use internet and web-based educational strategies may be more effective when they are delivered in the home environment (Kankkunen et al., 2004). Follow-up telephone calls have offered a reduction in clinic visits (Jones et al., 2007; Le et al., 2007) and could be designed to offer educational support.

It is clear that we have moved family home pain management following T & A beyond trial and error. A strong foundation of research has been developed and can be used to build innovative interventions that will demonstrate the desired outcome of well-managed pain and symptoms during home recovery from T & A.

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