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Postoperative pain and analgesia administration in children after urological outpatient procedures

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Summary

Introduction

There are limited data about pain patterns, analgesic requirements and factors predicting opioid requirements of children undergoing outpatient urologic surgery. This prospective study aimed to assess recovery profiles and pain medication requirements.

Methods

Patients between 6 months and 12 years of age were recruited prospectively between December 2013 and June 2014. Demographic and operative characteristics were collected. Following discharge home, the parents were asked to administer both acetaminophen and ibuprofen Q6H at a weight-adjusted dose, based on a schedule, until the end of postoperative day 2, and to administer the medication as required on postoperative day 3. Pain severity was recorded using validated pain scores (Face, Legs, Activity, Cry, Consolability/Parents' Postoperative Pain Measurement). A morphine prescription was provided for breakthrough pain. A Likert scale was used to assess parent's satisfaction with the pain management.

Results

A total of 249 patients were recruited, 111 patients (45%) returned appropriately completed surveys and were included in the final analysis. Mean age was 44.1 months (SD = 37.3). The performed procedures were orchidopexy (31), hypospadias repair (26), hernia/hydrocele repair (15), Fowler-Stephens procedure (13), meatoplasty (7), phalloplasty (4), scrotoplasty (1), circumcision (7), and diagnostic laparoscopy (5). After discharge home 17 patients (15.3%) received morphine. Mean utilization of non-opioid analgesia was 79% on postoperative day 1, 67% on day 2, 36% on day 3, and 2% on day 4. Parental satisfaction was high (92.0% satisfied/very satisfied). No patient, anaesthetic or surgical factors were associated with opioid use or prolonged need for postoperative analgesia.

Conclusion

The combination of scheduled non-opioid medications for maintenance and opioids for breakthrough pain provided satisfactory pain control after outpatient urologic surgery in children. There were no specific patient, anesthetic or surgical factors that predicted postoperative opioid requirements.

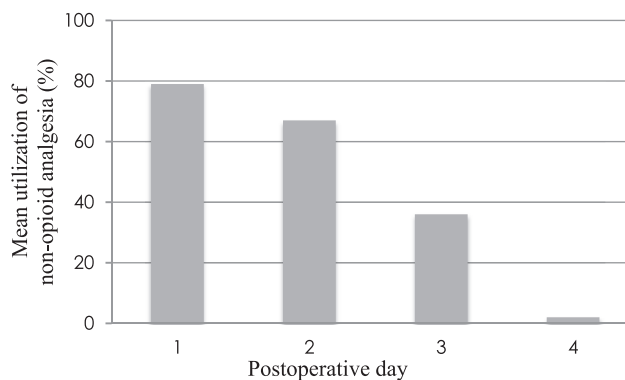


Figure Mean utilization of non-opioid analgesia on postoperative days 1–4.

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Introduction

In pediatric urology settings in North America, the vast majority of cases are performed as day care procedures. This leaves the responsibility for postoperative pain assessment and management predominantly with the parents. Although parental teaching supposedly equips the parents with appropriate knowledge about postoperative pain, it is well known that most children do not receive adequate pain medication once discharged home from the hospital.

Numerous studies have shown that parents experience difficulties recognizing their child's pain severity, and that they are also often hesitant to administer appropriate medication [1–6]. Multiple factors contribute to suboptimal management at home, including inadequate pain assessment, fear of side-effects and addiction, a personal or cultural bias towards pain and pain medication, and poor retention of given instructions [1–3,5,7,8].

It is now widely recognized that 'around-the-clock' (ATC) administration of pain medication is superior to 'as needed' (PRN) [9]. However, due to myths and misbeliefs, and provision of inadequate education, the recommendations are frequently not followed and the medication intervals decrease significantly within the first few days after surgery despite persistently elevated pain scores [3]. Little data is found on the 'multi-modal approach' to pain relief, which includes not only pharmacological interventions, but also psychological and physical strategies, such as distraction or application of cooling pads [10], and even less data on the effectiveness of this regime once the patient is discharged home. Also, despite the increasing prevalence of outpatient urologic surgery for children, there is little evidence about pain patterns and analgesic requirements – specifically factors associated with opioid use – particularly in the field of pediatric urology.

The aims of the current study were: to assess recovery profiles and pain medication requirements after discharge following minor outpatient urological procedures; how well the parents follow the recommendations of ATC administration of pain medication as part of a multi-modal approach; and the impact on postoperative pain and morphine requirement.

Methods

After approval by the Research and Ethics Board (REB #1000040083) patients between 6 months and 12 years of age undergoing urological outpatient procedures were recruited for this prospective, observational cohort study between December 2013 and June 2014. The parents were notified of the study during the pre-operative nursing call and, if interested, enrolled prior to surgery on the day of admission. Only parents with sufficient understanding of the English language were recruited into this study, in order to understand the instructions and to fill in the diaries.

Demographic and operative characteristics were collected, including pain management interventions provided during surgery and in the post-anaesthetic care unit (PACU). Demographics included ethnic background, level of education and family composition.

Following discharge from the PACU, the parents were asked to administer both acetaminophen and ibuprofen Q6H at an individual weight-adjusted dose, following a provided schedule, until the end of postoperative day 2, and to administer the medication only PRN on postoperative day 3 (Appendix 1). The late/midnight dose was only to be given if the child was awake. Timely administration of the medication was recorded by checking off the time in the diary. For breakthrough pain a prescription for morphine PO was provided, and administration was recorded, including a short explanation why the parents felt it was warranted. The parents were asked to record their child's pain intensity three times daily (TID), using age appropriate, validated pain assessment measures (Face, Legs, Activity, Cry, Consolability, FLACC, and Parents' Postoperative Pain Measurement, PPPM) (Appendix 2). Pain levels were measured using the PPPM scale for verbal children and the FLACC scale for non-verbal children. Significant pain was defined as PPPM score ≥ 6 or FLACC score ≥ 4 (i.e. pain intensity scores in the moderate to severe range). A Likert scale was used to assess parent's satisfaction with the pain management. Parents were provided with a detailed questionnaire to chart pain intensity scores, analgesic requirements and adverse effects from analgesia (nausea, constipation).

Statistical analysis

The two sample *t*-test or the Mann–Whitney rank sum test were used to compare the distributions of continuous variables between groups, depending on whether the data were normally distributed or not. The Fisher's exact test was used for categorical variables. A *p*-value of <0.05 was considered significant. Bivariate analysis using the Cox proportional hazards model was used to identify potentially significant predictors of re-operation. Significant variables identified by the bivariate model were used to construct a multivariate regression model.

Results

A total of 249 patients were recruited into the study. Of those, 111 patients returned appropriately completed surveys and were included in the final analysis (response rate 44.6%).

Patient demographics

Mean age was 44.1 months (SD 37.3) and 26 patients (23.4%) were under 1 year of age. Mean paternal age was 35.5 years (SD 5.0) and mean maternal age was 38.2 years (SD 6.1). The majority of patients were Caucasian (72.0%) and originated from two-parent households (88.3%). The majority of parents had post-secondary educational attainment (92.8%).

Surgical and anaesthetic factors

The most frequently performed procedure was orchidopexy (18 scrotal approach, 13 inguinal approach), followed by hypospadias repair (tubularized incision plate (TIP) procedure (20 distal, two mid-shaft, four others); 15 inguinal

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