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SCIENTIFIC ARTICLE

Administration of paracetamol versus dipyrone by intravenous patient-controlled analgesia for postoperative pain relief in children after tonsillectomy☆

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KEYWORDS
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Abstract
Background and objective: We compared the efficacy of intravenous (IV) paracetamol versus dipyrone via patient-controlled analgesia (PCA) for postoperative pain relief in children.
Methods: The study was composed of 120 children who had undergone elective tonsillectomy after receiving general anesthesia. Patients were divided into 3 groups according to the dosage of postoperative intravenous-patient-controlled analgesia: paracetamol, dipyrone, or placebo. Pain was evaluated using a 0- to 100-mm visual analog scale and 1- to 4-pain relief score at 30 min, 1, 2, 4, 6, 12, and 24 h postoperatively. Pethidine (0.25 mg kg^{-1}) was administered intravenously to patients requiring rescue analgesia. Pethidine requirements were recorded during the first 24 h postoperatively, and treatment related adverse effects were noted.
Results: Postoperative visual analog scale scores were significantly lower with paracetamol group compared with placebo group at 6 h ($p < 0.05$), dipyrone group compared with placebo group at 30 min and 6 h ($p < 0.05$). No significant differences regarding visual analog scale values at 1, 2, 4, 12, and 24 h were found. No significant differences were found between groups with respect to pain relief score ($p > 0.05$). Postoperative pethidine requirements were significantly lower with paracetamol and dipyrone groups compared with placebo group (62.5%, 68.4% vs 90%, $p < 0.05$). No significant differences were found between groups with respect to nausea, vomiting and the any other adverse effects of the drugs ($p > 0.05$).
Conclusions: Paracetamol and dipyrone have well tolerability profile and effective analgesic properties when administered IV-PCA for postoperative analgesia in children after tonsillectomy.

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PALAVRAS-CHAVE
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Administração de paracetamol *versus* dipirona em analgesia controlada pelo paciente por via intravenosa para alívio da dor no pós-operatório de crianças após tonsilectomia

Resumo
Justificativa e objetivo: Comparamos a eficácia da administração de paracetamol *versus* dipirona em analgesia controlada pelo paciente (PCA) por via intravenosa (IV) para alívio da dor no período pós-operatório em crianças.
Métodos: O estudo foi composto por 120 crianças submetidas à tonsilectomia sob anestesia geral. Os pacientes foram divididos em três grupos de acordo com a dose IV de analgesia controlada pelo paciente no pós-operatório: paracetamol, dipirona ou placebo. A dor foi avaliada usando uma escala visual analógica de 0-100 mm e escore de 1-4 para alívio da dor nos tempos de 30 minutos, 1, 2, 4, 6, 12 e 24 horas de pós-operatório. Petidina (0,25 mg kg^{-1}) foi administrada IV aos pacientes que precisaram de analgesia de resgate. A necessidade de petidina foi registrada durante as primeiras 24 h de pós-operatório, e os efeitos adversos relacionados ao tratamento foram registrados.
Resultados: Os escores da escala visual analógica no pós-operatório foram significativamente menores no grupo paracetamol em comparação com o grupo placebo em 6 h ($p < 0,05$), no grupo dipirona em comparação com o grupo placebo em 30 min e 6 h ($p < 0,05$). Não houve diferença significativa em relação aos valores da escala visual analógica nos tempos avaliados de 1, 2, 4, 12 e 24 horas. Não houve diferença significativa entre os grupos quanto ao escore de alívio da dor ($p > 0,05$). A necessidade de petidina foi significativamente menor nos grupos paracetamol e dipirona em comparação com o grupo placebo (62,5%, 68,4% vs. 90%, $p < 0,05$). Não houve diferença significativa entre os grupos em relação à incidência de náusea, vômito e outros efeitos adversos dos medicamentos ($p > 0,05$).
Conclusões: Paracetamol e dipirona possuem um perfil de boa tolerabilidade e propriedades analgésicas eficazes quando administrados IV para ACP no pós-operatório de crianças após tonsilectomia.

Introduction

Tonsillectomy can be considered as the most widely practiced one among the childhood surgical operations. Sufficient treatment of postoperative pain in children is a main concern for patients, parents and clinicians.[1] However, successful treatment of postoperative pain in children is still difficult despite of recent progress in control technique of pain and analgesics. Insufficient postoperative pain control can result in impairment of the feature of life, recovery of patients and social stress for both the children and the parents.[1] Analgesics such as opioids and non-opioids are frequently used for postoperative pain management. The severity of side effects related with effective opioid dosage may restrict their usage for sufficient postoperative pain control. Intravenous (IV) non-opioid analgesics are used extensively for the treatment of postoperative pain. Non-opioid analgesics have been shown to effectively decrease postoperative pain, opioid consumption and thus their adverse effects during the postoperative period in children.[2] There are only a few alternative analgesic agents for IV non-opioid analgesia for the treatment of postoperative pain in pediatric patient.[2] Paracetamol (acetaminophen)[2–6] and dipyrone (metamizol)[7–9] are two frequently used IV non-opioid analgesics.[10,11] Paracetamol is the most popular, effective and most widely used non-opioid analgesic for acute pain.[11] Dipyrone has potent pain-relieving, antipyretic, spasmolytic properties, and is also an effective non-opioid analgesic for acute pain.[11] Paracetamol and dipyrone generally show similar clinical efficacy.[5,12] On the other hand, administration of paracetamol resulted in a significant reduction in the number of patients requiring opioid analgesics to achieve adequate postoperative pain relief when compared with dipyrone.[13] IV-PCA is an effective method for the treatment of postoperative pain both in adults and children.[2] IV-PCA is an effective and safe method providing appropriate levels of analgesia in children over 5 years of age.[14,15] The literature review reveals that there are a few studies conducted with non-opioid analgesics by IV-PCA for treatment of postoperative pain in only adults.[16–21] Although non-opioid analgesics (paracetamol and dipyrone) are widely used in the pediatric age group, surprisingly we have not seen any report concerning non-opioid analgesic (paracetamol or dipyrone) use via IV-PCA for postoperative pain treatment in children.

In our study, we aimed to test the hypothesis that IV-PCA with paracetamol for treatment of postoperative pain in children after tonsillectomy is superior and an acceptable alternative for dipyrone by IV-PCA in terms of an adequate postoperative pain relief and reduction in the number of patients requiring opioid analgesics.

Methods

The protocol was approved by the Ethics Committee of University Faculty of Medicine (project no: KA08/47).