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Benefits and harms associated with analgesic medications used in the management of acute dental pain

An overview of systematic reviews

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ABSTRACT

Background. Effective pain management is a priority in dental practice. Government and private agencies highlight the need to provide optimal pain relief, balancing potential benefits and harms of both opioid and nonopioid analgesic agents. The purpose of this study is to summarize the available evidence on the benefits and harms of analgesic agents, focusing on preexisting systematic reviews.

Types of Studies Reviewed. An overview of systematic reviews was conducted to evaluate the efficacy or reported adverse events associated with orally administered medication or medication combinations for relief of acute pain. Reviews were inclusive of all age populations but were limited to those that evaluated medication and medication combinations marketed in the United States and had moderate or high methodological quality according to the A MeaSurement Tool to Assess systematic Reviews (AMSTAR) 2 tool.

Results. Five reviews were found eligible for inclusion. The data identified combinations of ibuprofen and acetaminophen as having the highest association with treatment benefit in adult patients and the highest proportion of adult patients who experienced maximum pain relief. Diflunisal, acetaminophen, and oxycodone were found to have the longest duration of action in adult patients. Medication and medication combinations that included opioids were among those associated most frequently with acute adverse events in both child and adult-aged patient populations.

Practical Implications. The best available data suggested that the use of nonsteroidal medications, with or without acetaminophen, offered the most favorable balance between benefits and harms, optimizing efficacy while minimizing acute adverse events.

Key Words. Analgesia; pain relief; adverse events; systematic review; decision-making opioids; nonsteroidal anti-inflammatory drugs; opioids; acetaminophen.

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Safe and effective pain management is an essential goal for all dental practitioners. Oral formulations, including both opioid and nonopioid analgesic agents, are among the medications commonly provided to manage pain for dental patients. Although the 2016 recommendations from the Centers for Disease Control and Prevention (CDC) about management of long-term pain were less well codified with respect to analgesic use for acute pain, it did include recommendations about limiting dose and duration of opioid-containing medications.¹ This likely reflects growing concern about the increasing occurrence of opioid misuse leading to deaths from both prescription and illegal opioids.² Although effective redress of this problem will be multifaceted, it will likely result in increased scrutiny about the choice of medications to be used when managing acute pain. The dual goals for pain management are safety and efficacy.

A variety of oral formulations of prescription and over-the-counter analgesic agents are often included alone or in combination as a component in strategies to manage acute dental pain.³

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Clinical considerations when determining the analgesic agent to be used include, but are not limited to, severity of the pain, patient pain sensitivity, medical history, specific dental pathologic process, and, in postoperative situations, the degree of surgical trauma.

The objective of our study is to summarize the data on oral analgesic medications with the aim of creating a compendium that details both the benefits and harms of these medications as a resource for dentists to use in their clinical decision making. This work was conducted in response to a request from the American Dental Association (ADA) Council on Dental Practice, using a protocol established a priori (available from the authors) and registered with the International Prospective Register of Systematic Reviews (PROSPERO) database (no. CRD42017080270) to summarize the best available evidence with respect to questions of safety and efficacy for relief of acute pain relevant to dental practice in the United States.

METHODS

This overview of reviews used the rapid review methodology⁴ to identify and summarize the available evidence from existing systematic reviews that examined the relative safety and efficacy of oral opioid and nonopioid analgesic agents available for use in the United States for the management of acute postoperative dental pain.

Selection criteria of included reviews

Type of Studies

We included systematic reviews and overviews of reviews with or without meta-analysis. We considered a report to be a systematic review by using a combination of selection criteria

- identified by the authors as a systematic review;
- included an explicit description of the search strategy;
- conducted the search in at least 2 electronic databases.

In addition, we selected reviews that ranked as moderate to high methodological quality according to the A MeaSurement Tool to Assess systematic Reviews (AMSTAR) 2 tool.⁵ Narrative reviews, editorials, and letters to the editor were excluded.

Type of Participants and Interventions

Systematic reviews or overviews of reviews that summarized data on the use of orally administered medications for the management of acute pain from studies that involved either adults or children were eligible for inclusion. The source of pain was mostly acute postoperative dental pain (for example, following third-molar extraction).

Type of Outcome Measures

Systematic reviews or overviews of reviews with data on the pharmacologic management of acute pain that reported on efficacy of pain relief (defined as at least 50% relief from maximum pain that lasted 46 hours), duration of pain relief (time before rescue remediation was requested), or any acute adverse events were included in this review.

Search methods for systematic review retrieval

The literature search strategy used the key words “(acute pain) AND (dental OR dentist* OR postop* OR postsurg*)” and was performed with the PubMed Clinical Queries for Systematic Reviews tool on April 13, 2017. In addition, manual searches of the reference lists of key articles were conducted to complement the electronic search. We also searched PROSPERO to identify systematic reviews under development that may have been relevant for our study.

Study selection, data collection, and analysis

The preliminary screening of titles and abstracts for all potentially eligible citations identified in the literature search was conducted in duplicate with the use of EndNote (Clarivate Analytics). In a second stage, the full text of any citation considered as potentially eligible was retrieved, and the eligibility was assessed. In case of disagreements among screeners, a third researcher acted as arbiter.

Assessment of the Methodological Quality of Reviews

We used the AMSTAR 2 tool to evaluate the methodological quality of the potentially eligible systematic reviews,⁵ and we used the AMSTAR rating of the individual reviews included in the

ABBREVIATION KEY

ADA:	American Dental Association.
AMSTAR:	A MeaSurement Tool to Assess systematic Reviews.
CDC:	Centers for Disease Control and Prevention.
NNTB:	Number needed to treat for benefit.
NNTH:	Number needed to treat to harm.
PROSPERO:	International Prospective Register of Systematic Reviews.

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