Does audiovisual distraction reduce dental anxiety in children under local anesthesia? A systematic review and meta-analysis.

OBJECTIVES: To perform a systematic review and meta-analysis on the effects of audiovisual distraction on reducing dental anxiety in children during dental treatment under local anesthesia.

METHODS: The authors identified eligible reports published through August 2017 by searching PubMed, EMBASE, and Cochrane Central Register of Controlled Trials. Clinical trials that reported the effects of audiovisual distraction on children's physiological measures, self-reports, and behavior rating scales during dental treatment met the minimum inclusion requirements. The authors extracted data and performed a meta-analysis of appropriate articles.

RESULTS: Nine eligible trials were included and qualitatively analyzed; some of these trials were also quantitatively analyzed. Among the physiological measures, heart rate or pulse rate was significantly lower (p = .01) in children subjected to audiovisual distraction during dental treatment under local anesthesia than in those who were not; a significant difference in oxygen saturation was not observed. The majority of the studies using self-reports and behavior rating scales suggested that audiovisual distraction was beneficial in reducing anxiety perception and improving children's cooperation during dental treatment.
CONCLUSION: The audiovisual distraction approach effectively reduces dental anxiety among children. Therefore, we suggest the use of audiovisual distraction when children need dental treatment under local anesthesia.

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Publication Type
Journal Article. Review.
Year of Publication
2018

<2>
Unique Identifier
29936238
Title
Success rate of first attempt 4% articaine para-apical anesthesia for the extraction of mandibular wisdom teeth.
Source
VI 1
Status
Publisher
Authors
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Abstract
Dental extraction is one of the acts that cannot be undertaken or carried out without total analgesia. Unfortunately, the success of anesthesia is not always systematic. Failures are noted during the extraction of mandibular wisdom teeth and pain management therefore remains a challenge for their extraction. The anesthesia technique and nature of the adapted anesthetic solution are controversial. However, the most commonly used technique is the Lower Alveolar Nerve Block (IANB). This technique has disadvantages (trismus, risk of intra-arterial injection and hematoma) and a failure rate of up to 88%. In some survey, 90% of 93 practitioners had difficulty obtaining proper anesthesia. Other clinical studies have also shown overall failure rates of 37%-47%, and 15%-35% on healthy lower molars. Recent studies have evaluated the success rate of articaine at between 54% and 94%, while others have shown that for mandibular teeth, articaine is more effective in para-apical anesthesia than lidocaine. Sixty subjects were selected for the study. The aim was to evaluate the overall success rate of first intention 4% articaine para-apical anesthesia during extraction of third mandibular molars. The overall success rate of para-apical anesthesia was 87%.

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Publication Type
Journal Article.
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<3>
Unique Identifier
29959599
Title
Needle fracture as a complication of dental local anesthesia: recommendations for prevention and a comprehensive treatment algorithm based on literature from the past four decades.
Source
VI 1
Status
Publisher
Authors
Acham S; Truschnegg A; Rugani P; Kirnbauer B; Reinbacher KE; Zemann W; Kqiku L; Jakse N.
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Local Messages

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Abstract

OBJECTIVES: The aim of this publication is to provide a concept for prevention and a standardized step-by-step clinical approach to this rare but serious and potentially preventable complication of dental local anesthesia.

MATERIALS AND METHODS: We collected data with a PUBMED search using the key words "local anesthesia," "dental anesthesia/anesthesia" OR "mandibular block anesthesia," "complication," "hypodermic needle," "needle breakage" OR "needle fracture," and "foreign body AND removal" OR "retrieval." The existing literature was systematically evaluated from 1980 to date using Microsoft Excel 2007 (Microsoft Corporation).

RESULTS: After analysis of the literature, we included 36 reports documenting 59 needle breakage events and defined possible risk factors and preventive measures. All relevant reported parameters were listed in tabular form. The main result of this article is a treatment algorithm for this complication.

CONCLUSIONS: Prevention of a needle fracture should be the main goal during local dental anesthesia. Use of longer hypodermic needle can obviate complex retrieval surgery. If immediate removal of the fragment fails, localization, planning, and the necessary surgical procedure should be arranged promptly.

CLINICAL RELEVANCE: Following a strict algorithm, successful surgical handling of this complication will depend on minimizing risk and following treatment recommendations closely.

Publication Type

Journal Article. 
Year of Publication 
2018

Abstract

Local anesthetics are commonly used in most medical and dental practice. While adverse effects are rare, the rising prevalence of local anesthetics in practice has resulted in a greater incidence of local anesthetic toxicity. From minor symptoms to major cardiac or central nervous system (CNS) effects, local anesthetic systemic toxicity (LAST) is an important consequence of which to be aware. Systemic toxicity was originally associated with seizures and respiratory failure. However, in the 1970s, cardiac effects were also recognized, as bupivacaine-associated fatal cardiac toxicity was discovered in healthy adults. This article reviews the mechanisms, frequency, clinical characteristics, treatment, and prevention of LAST.
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION

Source

VI 1

Status
Publisher

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Abstract
OBJECTIVE: To conduct a meta-analysis of studies that have employed the Early Childhood Oral Health Impact Scale (ECOHIS) and Child Oral Health-Related Quality of Life (COHRQoL) instruments, to evaluate the oral health-related quality of life (OHRQoL) changes in children following dental treatment under general anaesthesia (DGA).

METHOD: A systematic search of 5 databases was conducted in accordance with the PRISMA guidelines. The inclusion criteria were use of ECOHIS and COHRQoL, pre-and post-operative assessments, patients aged between 0 and 16 years, no restrictions on the follow-up period and DGA. The primary outcome measure was changes in quality of life for both the children, which was based on mean difference (MD). Twenty-two articles were included in the meta-analysis.

RESULTS: A favourable outcome in OHRQoL was identified in all studies. The combined MD for ECOHIS and COHRQoL were 1.62 [95% CI 1.52-1.71; P<0.00001; I2=0%] and 0.86 [95% CI 0.74-0.99; P<0.00001; I2=0%], respectively, both with no evidence of heterogeneity.

CONCLUSION: There is evidence to support that the OHRQoL of children was improved, with large effect size, in the short-term following DGA.

CLINICAL RELEVANCE: Dental treatment under GA significantly improved the OHRQoL of children.

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Journal Article.

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2018

Unique Identifier
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Title
The efficiency of topical anesthetics as antimicrobial agents: A review of use in dentistry. [Review]

Source

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Abstract
Topical anesthetics are commonly used in oral & maxillofacial surgery to control pain in the oral cavity mucosa before local anesthetic injection. These anesthetic agents come in many forms, developed for different usages, to minimize adverse reactions,
and for optimal anesthetic efficiency. Earlier studies have revealed that these agents may also limit the growth of microorganisms in the area of anesthetic application. Many topical anesthetic agents show different levels of antimicrobial activity against various bacterial strains and Candida. The dosage of local anesthetic agent used in some clinical preparations is too low to show a significant effect on microbial activity. Efficiency of antimicrobial activity depends on the local anesthetic agent's properties of diffusion within the bloodstream and binding efficiency with cytoplasmic membrane, which is followed by disruption of the bacterial cell membrane. The antimicrobial properties of these agents may extend their usage in patients to both control pain and infection.

To develop the topical local anesthetic optimal usage and antimicrobial effect, a collaborating antiseptic agent may be used to benefit the local anesthetic. However, more research is required regarding minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of topical local anesthetic agents with drug interaction between anesthetics and antiseptic agents.

Publication Type
Journal Article. Review.
Year of Publication
2018
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION

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Jafarabadi, Mohammad Asghari. Associate Professor of Biostatistics, Department of Statistics and Epidemiology, Faculty of Health, Tabriz University of Medical Sciences, Tabriz, Iran.

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Abstract
The aim of this study was to provide an evidence-based answer to the question: "Is 3.6 mL volume of an anesthetic agent more effective than 1.8 mL volume in providing anesthesia for mandibular molars?" Following formulation of research question and keyword selection, a comprehensive search of the following databases was conducted: Cochrane library, PubMed, Scopus, Google Scholar, ProQuest, and Clinicaltrials.gov. Three-phase eligibility appraisal and quality assessment of the studies were carried out by 2 independent reviewers. To reduce clinical heterogeneity, the included studies were divided into 2 groups: studies on healthy teeth and studies on teeth with pulpitis. The data of included studies were statistically combined through meta-analysis using a fixed-effects model. A total of 20,778 records were initially retrieved from the search. Following screening and eligibility assessment, 8 studies met the eligibility criteria and were included for qualitative synthesis. Of those, 5 studies were qualified for meta-analysis. In the irreversible pulpitis group, increasing the volume of anesthetic agent from 1.8 to 3.6 mL significantly increased the success rate of inferior alveolar nerve block (risk ratio = 2.45, 95% CI: 1.67-3.59, p < .001). However, there was insufficient evidence to draw a conclusion regarding healthy teeth.

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30049470

Title
Amaurosis, an Unusual Complication Secondary to Inferior Alveolar Nerve Anesthesia: A Case Report and Literature Review.

Source

Status
In-Process

Authors
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Abstract
Ocular complications after an inferior alveolar nerve anesthesia are rare. These complications, although temporary and benign, can be distressing to both the patient and the clinician. A 37-year-old male patient was administered an inferior alveolar nerve block for the root canal treatment of tooth #30. Immediately after the administration of local anesthesia, the patient reported complete loss of vision. The patient recovered completely after 15 minutes. In particular, amaurosis is quite uncommon and usually heralds a more sinister pathology such as stroke. This case report presents an unusual case of ocular complication after an inferior alveolar nerve block. Adequate knowledge of the regional anatomy and physiology of the orbit and its nearby structures, the proposed causes of ocular complications, and prevention and management is necessary to manage such events.

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Title
The Editor recommends this issue's article to the reader: Anaesthetic efficacy of Articaine versus Lidocaine in children's dentistry: a systematic review and meta-analysis.

Source

Status
In-Process

Authors
The effect of adjusting the pH of local anaesthetics in dentistry: a systematic review and meta-analysis. [Review]

Source

Abstract
The acidic nature of commercial local anaesthetics (LAs) can cause pain during infiltration and delay the onset of anaesthesia. It is suggested that adjusting the pH of anaesthetic agents could minimize these effects. This systematic review aimed to evaluate the efficacy of buffered LAs in reducing infiltration pain and onset time during dental procedures. MEDLINE, Embase, Scopus and Scielo databases were searched up to April 2017. Randomized controlled trials comparing buffered and unbuffered LAs for intraoral injections were included. Risk of bias was assessed using the Cochrane Collaboration tool. Data upon injection pain and onset time were pooled in a random-effects model. Subgroup analyses compared normal and inflamed tissues, and terminal infiltrations and inferior alveolar nerve (IAN) blocks. Meta-regressions were performed to explain heterogeneity. Fourteen articles were included in this review. Lidocaine with epinephrine was the most used anaesthetic combination. Nonlidocaine studies (n = 2) were not pooled in the meta-analysis. Buffered lidocaine did not result in less pain during intraoral injections: mean difference -6.4 (95% CI -12.81 to 0.01) units in a 0-100 scale. Alkalinized lidocaine did not reduce the onset time in normal tissues when terminal infiltration techniques were used, but resulted in a more rapid onset for IAN blocks (-1.26 min) and in inflamed tissues (-1.37 min); however, this change may not be clinically relevant, considering the time required to prepare the buffered agent. Studies performed using other anaesthetic salts did not show robust and clinically significant results in favour of alkalinization.


Source
Scientific Reports. 7:40987, 2017 01 20.

Abstract
The need for effective approaches for pain management during third molar surgery is important. The aim of this study was to evaluate the efficacy of three block anesthesia methods for pain management during mandibular third molar extraction: inferior alveolar nerve block (IANB), mental nerve block (MNB), and third molar block (TMB). A systematic review using the Cochrane Collaboration tool was conducted. Six articles were included in this review. The results were not pooled because of differences in the use of anaesthetic combinations. Buffered lidocaine was used more frequently compared to nonbuffered solutions. Alkalinization did not have a significant effect on pain reduction. IANB alone provided transient pain relief compared to a combination of IANB and MNB/TMB. However, this change may not be clinically relevant considering the time required to prepare the buffered agent. Further randomized controlled trials are needed to evaluate the efficacy of this technique in clinical practice.
A patient's pain during mandibular third molar extraction often creates problems for a dental surgeon and can also cause immense patient discomfort, such as decreased quality of life, serious complications, or even danger to the patients' lives. Effective pain management is therefore of great importance. Conventional block anesthesia method often fails to control such pain completely during an operation. Therefore, two available alternatives, Gow-Gates (G-G) and Vazirani-Akinosi (V-A) methods, have been developed. However, the results of current studies regarding their effectiveness and safety are somewhat ambiguous. The use of G-G and V-A techniques is therefore restricted. This study did a comprehensive review of the relevant research and finally 7 RCTs were included. The results of this meta-analysis indicate that both G-G and V-A techniques have a lower risk of positive aspiration. G-G technique also evidenced a higher success rate than the conventional method. V-A was faster while the G-G technique in contrast had a slower onset time than the conventional technique. In terms of the measurement of analgesic success, however, the V-A method was statistically indistinguishable from conventional techniques. These findings will hopefully endow clinicians with the knowledge required to make appropriate choices for effective anesthesia during lower third molar extraction.

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Journal Article

**Year of Publication**
2018

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29635712

**Title**
True Allergy to Amide Local Anesthetics: A Review and Case Presentation.

**Source**

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**Local Messages**
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**Abstract**
Adverse reactions to local anesthetics are usually a reaction to epinephrine, vasovagal syncope, or overdose toxicity. Allergic reactions to local anesthetics are often attributed to additives such as metabisulphite or methylparaben. True allergic reactions to amide local anesthetics are extremely rare but have been documented. Patients with true allergy to amide local anesthetics present a challenge to the dental practitioner in providing adequate care with appropriate intraoperative pain management. Often, these patients may be treated under general anesthesia. We report a case of a 43-year-old female patient that presented to NYU Lutheran Medical Center Dental Clinic with a documented history of allergy to amide local anesthetics. This case report reviews the use of 1% diphenhydramine with 1:100,000 epinephrine as an alternative local anesthetic and reviews the relevant literature.
Anaesthetic efficacy of articaine versus lidocaine in children's dentistry: a systematic review and meta-analysis. [Review]

Source

VI 1
Status
In-Process

Authors
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Abstract
BACKGROUND: Over the last few years, numerous reviews and studies have awarded articaine hydrochloride local anaesthetic (LA) a superior reputation, with outcomes of different studies demonstrating a general tendency for articaine hydrochloride to outperform lidocaine hydrochloride for dental treatment. Nevertheless, there seems to be no clear agreement on which LA solution is more efficacious in dental treatment for children. There is no previous publication systematically reviewing and summarising the current best evidence with respect to the success rates of LA solutions in children.

AIMS: To evaluate the available evidence on the efficacy of lidocaine and articaine, used in paediatric dentistry.

DESIGN: A systematic search was conducted on Cochrane CENTRAL Register of Controlled Trials, MEDLINE (OVID; 1950 to June 2017), Cumulative Index to Nursing and Allied Health Literature (CINAHL; EBSCOhost; 1982 to June 2017), EMBASE (OVID; 1980 to June 2017), SCI-EXPANDED (ISI Web of Knowledge; 1900 to June 2017), key journals, and previous review bibliographies through June 2017. Original research studies that compared articaine with lidocaine for dental treatment in children were included. Methodological quality assessment and assessment of risk of bias were carried out for each of the included studies.

RESULTS: Electronic searching identified 525 publications. Following the primary and secondary assessment process, six randomised controlled trials (RCT) were included in the final analysis. There was no difference between patient self-reported pain between articaine and lidocaine during treatment procedures (SMD = 0.06, P-value = 0.614), and no difference in the occurrence of adverse events between articaine and lidocaine injections following treatment in paediatric patients (RR = 1.10, P-value = 0.863). Yet, patients reported significantly less pain post-procedure following articaine injections (SMD = 0.37, P-value = 0.013). Substantial heterogeneity was noted in the reporting of outcomes among studies, with the overall quality of majority of studies being at high risk of bias.

CONCLUSIONS: There is low quality evidence suggesting that both articaine as infiltration and lidocaine IAD nerve blocks presented the same efficacy when used for routine dental treatments, with no difference between patient self-reported pain between articaine and lidocaine during treatment procedures. Yet, significantly less pain post-procedure was reported following articaine injections. There was no difference in the occurrence of adverse events between articaine and lidocaine injections following treatment in paediatric patients.

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Managing pain and anxiety in patients has always been an essential part of dentistry. To prevent pain, dentists administer local anaesthesia (LA) via a needle injection. Unfortunately, anxiety and fear that arise prior to and/or during injection remains a barrier for many children and adults from receiving dental treatment. There is a constant search for techniques to alleviate the invasive and painful nature of the needle injection. In recent years, researchers have developed alternative methods which enable dental anaesthesia to be less invasive and more patient-friendly. The aim of this review is to highlight the procedures and devices available which may replace the conventional needle-administered local anaesthesia. The most known alternative methods in providing anaesthesia in dentistry are: topical anaesthesia, electronic dental anaesthesia, jet-injectors, iontophoresis, and computerized control local anaesthesia delivery systems. Even though these procedures are well accepted by patients to date, it is the authors' opinion that the effectiveness practicality of such techniques in general dentistry is not without limitations.
The first clinical application of nitrous oxide (N\textsubscript{2}O) was in 1844, by an American dentist named Horace Wells who used it to control pain during tooth extraction. Since then, N\textsubscript{2}O has shared a 170-year history with modern dental anesthesia. N\textsubscript{2}O, an odorless and colorless gas, is very appealing as a sedative owing to its anxiolytic, analgesic, and amnestic properties, rapid onset and recovery, and, in particular, needle-free application. Numerous studies have reported that N\textsubscript{2}O can be used safely and effectively as a procedural sedation and analgesia (PSA) agent. However, N\textsubscript{2}O can lead to the irreversible inactivation of vitamin B12, which is essential for humans; although rare, this can be fatal in some patients.
**Title:** Efficacy of Ketamine in Pediatric Sedation Dentistry: A Systematic Review.

**Source:** Compendium of Continuing Education in Dentistry. 39(5):e1-e4, 2018 May.

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**Abstract**

BACKGROUND: Ketamine has been used as a safe and effective sedative to treat adults and children exhibiting high levels of anxiety or fear during dental treatment. Pediatric dentistry often involves patients with high levels of anxiety and fear and possibly few positive dental experiences. Patient management can involve behavioral approaches, as well as the use of sedation or general anesthesia with a variety of agents, including midazolam, diazepam, hydroxyzine, meperidine, and ketamine. The aim of this study was to investigate the clinical efficacy of ketamine use in pediatric sedation dentistry through systematic review and analysis.

**METHODS:** A systematic review of publications between 1990 and 2015 was conducted using PubMed and MEDLINE databases maintained by the US National Library of Medicine and the National Institutes of Health. The keywords used were (ketamine) AND (dental OR dentistry) AND (sedation). The abstract and title of all potential publications were then screened for clinical trials and to remove non-English articles, non-human or animal trials, and other non-dental or non-relevant studies.

**RESULTS:** A total of 1,657 citations were initially identified, reviewed, and screened, eventually resulting in inclusion of 25 clinical trials in this systematic review. Nineteen studies evaluated ketamine effects in pediatric dental sedation using oral (non-invasive) administration, three involved subcutaneous or intramuscular injection, and three were completed intravenously. Evidence analysis of these trials revealed the majority (n = 22/25) provided strong, positive evidence for the use of ketamine (alone or in combination) to reduce dental anxiety and behavioral non-compliance with the remainder suggesting equivocal results. Additional endpoints evaluated in some studies involved dosage, as well as time to achieve sedation effect.

**CONCLUSION:** The use of ketamine (alone or in combination) can provide safe, effective, and timely sedation in pediatric patients regardless of the route of administration.

**Title:** Anesthetic Considerations for Angelman Syndrome: Case Series and Review of the Literature.

**Source:** Anesthesiology & Pain Medicine. 7(5):e57826, 2017 Oct.

**Authors:** Warner ME; Martin DP; Martin MA; Gavrilova RH; Sprung J; Weingarten TN.

**Abstract**

Background: Angelman syndrome is a rare neurodevelopmental disorder characterized by intellectual disability, severe speech impairment, ataxia, seizures, happy demeanor, distinctive craniofacial features, high vagal tone, and gamma-aminobutyric acid receptor abnormalities. The aim of this report is to review our experience of patients with Angelman syndrome undergoing anesthetic management.
Methods: We retrospectively reviewed perioperative course of patients with Angelman syndrome who underwent procedures under anesthesia from 2000 to 2016.

Results: Six patients with Angelman syndrome underwent 18 procedures; 14 performed under general anesthesia, and 4 with monitored anesthetic care, many for minor procedures (e.g., dental and diagnostic). Five patients had profound developmental delay and were nonverbal and 4 of them had epilepsy. The perioperative courses were uncomplicated except a 2 year-old girl having an intraoperative bronchospasm, a 16 year-old girl requiring flumazenil administration, and 28 year-old man who was electively intubated with a videolaryngoscope because of airway management concerns. No patients were documented as having postoperative pain.

Conclusions: Angelman syndrome patients often require anesthesia for relatively innocuous procedures, and their speech impairment and happy demeanor can confound postoperative pain assessment. Patients can have atypical responses to benzodiazepines. Craniofacial abnormalities can complicate airway management. Although not encountered in this series, anesthesiologists need to be aware that Angelman syndrome patients have developed malignant bradydysrhythmias while anesthetized.

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2017

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29481773

Title
Providing Anesthesia in the Oral and Maxillofacial Surgery Office: A Look Back, Where We Are Now and a Look Ahead. [Review]

Source

Abstract
Throughout its development the practice of oral and maxillofacial surgery has been richly associated with the provision of anesthetic services. Dentists and particularly oral and maxillofacial surgeons have advanced the science associated with anesthesia especially in the outpatient setting. This article will look back on the development of anesthesia as it relates to oral and maxillofacial surgery, discuss the current mode of anesthesia in the oral surgeon's practice and look ahead to what innovations are advancing this field.

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Source
Anaesthesia. 73(5):612-618, 2018 May.

Abstract

Authors
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**RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION**

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**Local Messages**

**THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:**

**Abstract**

Throat packs are commonly inserted by anaesthetists after induction of anaesthesia for dental, maxillofacial, nasal or upper airway surgery. However, the evidence supporting this practice as routine is unclear, especially in the light of accidentally retained throat packs which constitute 'Never Events' as defined by NHS England. On behalf of three relevant national organisations, we therefore conducted a systematic review and literature search to assess the evidence base for benefit, and also the extent and severity of complications associated with throat pack use. Other than descriptions of how to insert throat packs in many standard texts, we could find no study that sought to assess the benefit of their insertion by anaesthetists. Instead, there were many reports of minor and major complications (the latter including serious postoperative airway obstruction and at least one death), and many descriptions of how to avoid complications. As a result of these findings, the three national organisations no longer recommend the routine insertion of throat packs by anaesthetists but advise caution and careful consideration. Two protocols for pack insertion are presented, should their use be judged necessary.

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<table>
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<th>Publication Type</th>
<th>Journal Article. Review.</th>
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<td>2018</td>
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**Unique Identifier**

29622315

**Title**

Anesthetic Pump Techniques Versus the Intermittent Bolus: What the Oral Surgeon Needs to Know. [Review]

**Source**


**Status**

In-Process

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**Local Messages**

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**Abstract**

The most popular agents in use for office-based anesthesia are propofol, ketamine, and remifentanil, which have the desirable properties of rapid onset and short duration of action. A useful parameter in assessing these agents is the context-sensitive half-time. These anesthetic agents demonstrate relatively low, flat plots compared with older agents. For delivery of intravenous anesthetics, oral and maxillofacial surgeons have relied small incremental boluses with great success. However, relatively simple syringe infusion pumps can provide an even "smoother" anesthetic. This article familiarizes oral and maxillofacial surgeons with the advantages of infusion pumps and provides examples of their use.

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<td>2018</td>
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</table>

**Unique Identifier**

29622312

**Title**


**Source**


**Status**

In-Process

**Authors**

Robert RC; Patel CM.

**Authors Full Name**
**Preoperative Evaluation and Patient Selection for Office-Based Oral Surgery Anesthesia. [Review]**

**Source**

**Abstract**

Provision of an outpatient anesthetic requires careful review of the patient's medical history along with salient aspects of the physical examination. The oral and maxillofacial surgeon may need to consult with the patient's medical providers to gain an understanding of the patient's potential risks for an adverse event. This article reviews key aspects of the patient evaluation so that an informed determination of suitability for an office anesthetic can be made.

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Journal Article. Review.

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2018

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29304910

**Title**
Benefits and harms of capnography during procedures involving moderate sedation: A rapid review and meta-analysis.

**Source**

**Abstract**

An effective office emergency preparedness plan for the oral and maxillofacial surgery office can be developed through the use of well-designed checklists, cognitive aids, and regularly scheduled in situ simulations with debriefings. In order to achieve this goal, the hierarchical culture of medicine and dentistry must be overcome, and an inclusive team concept embraced by all members of the staff. Technologic advancements in office automation now make it possible to create interactive cognitive aids. These enhance office emergency training and provide a means for more rapid retrieval of essential information and guidance during both simulations and a real crisis.
BACKGROUND: Patient safety is a priority in dentistry. Evaluating the benefits and harms associated with the addition of capnography to standard monitoring during moderate sedation for adult patients in the dental practice setting is needed.

TYPES OF STUDIES REVIEWED: The authors used rapid review methodology to identify relevant systematic reviews, which they updated through a systematic search by using the same search strategy as the identified reviews. The authors searched PubMed and Google Scholar and through the references of the identified systematic reviews, which yielded 2,892 studies. Inclusion criteria were that the article was available in English, was original research in adult humans who had undergone moderate procedural sedation, and involved comparing standard monitoring with the addition of capnography.

RESULTS: Sixteen studies were eligible, involving 3,866 adults undergoing procedural sedation. The authors used the Grading of Recommendations Assessment, Development and Evaluation approach to evaluate the evidence and rate it as being of moderate to low quality because of high risk of bias and heterogeneous effects for the outcomes of hypoxemia and adverse respiratory events. Capnography had higher sensitivity to detect adverse respiratory events than did standard monitoring alone (0.92; 95% confidence interval, 0.65 to 0.99) and may reduce the risk of developing hypoxemia by 31% (risk ratio, 0.69; 95% confidence interval, 0.57 to 0.82). Capnography did not affect the risk of developing serious adverse events, procedure time, sedation quality, or patient satisfaction.

CONCLUSIONS AND PRACTICAL IMPLICATIONS: Adding capnography to standard monitoring of adults during moderate sedation may reduce the risk of developing hypoxemia, increase detection of adverse respiratory events, and is not associated with additional harms. These findings suggest routine use of capnography during moderate sedation has the potential to reduce adverse anesthetic outcomes in dental practice.

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BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION

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vana Zundert, A A J. Department of Anaesthesia and Perioperative Medicine, Royal Brisbane and Women's Hospital, University of Queensland, Brisbane, Qld, Australia.

Local Messages
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Abstract
Experienced anaesthetists can be confronted with difficult or failed tracheal intubations. We performed a systematic review and meta-analysis to ascertain if the literature indicated if videolaryngoscopy conferred an advantage when used by experienced anaesthetists managing patients with a known difficult airway. We searched PubMed, MEDLINE, Embase and the Cochrane central register of controlled trials up to 1 January 2017. Outcome parameters extracted from studies were: first-attempt success of tracheal intubation; time to successful intubation; number of intubation attempts; Cormack and Lehane grade; use of airway adjuncts (e.g. stylet, gum elastic bougie); and complications (e.g. mucosal and dental trauma). Nine studies, including 1329 patients, fulfilled the inclusion criteria. First-attempt success was greater for all videolaryngoscopes (OR 0.34 (95%CI 0.18-0.66); p = 0.001). Use of videolaryngoscopy was associated with a significantly better view of the glottis (Cormack and Lehane grades 1 and 2 vs. 3-4, OR 0.04 (95%CI 0.01-0.15); p < 0.00001). Mucosal trauma occurred less with the use of videolaryngoscopy (OR 0.16 (95%CI 0.04-0.75); p = 0.02). Videolaryngoscopy has added value for the experienced anaesthetist, improving first-time success, the view of the glottis and reducing mucosal trauma.

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28879336

Title
The use of general anesthesia to facilitate dental treatment in adult patients with special needs. [Review]

Source

Status
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Abstract
General anesthesia is commonly used to facilitate dental treatment in patients with anxiety or challenging behavior, many of whom are children or patients with special needs. When performing procedures under general anesthesia, dental surgeons must perform a thorough pre-operative assessment, as well as ensure that the patients are aware of the potential risks and that informed consent has been obtained. Such precautions ensure optimal patient management and reduce the frequency of morbidities associated with this form of sedation. Most guidelines address the management of pediatric patients under general anesthesia. However, little has been published regarding this method in patients with special needs. This article constitutes a review of the current literature regarding management of patients with special needs under general anesthesia.

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Journal Article. Review.

Year of Publication
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28879335

Title
Use of local anesthetics for dental treatment during pregnancy; safety for parturient. [Review]

Source

Status
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Authors
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Shin, Teo Jeon. Department of Pediatric Dentistry and Dental Research Institute, School of Dentistry, Seoul National University, Seoul, Republic of Korea.

**Abstract**

Pregnancy induces significant anatomical and physiological changes in the mother. Many pregnant women need dental treatment due to poor oral hygiene related to pregnancy. However, most dentists are reluctant to provide, and most pregnant women are reluctant to receive, dental treatment during pregnancy. Theoretically, maternally administered drugs are transferred to the fetus. Depending on the types of drugs and the stage of pregnancy, the effects of drugs on the mother, as well as the fetus, may vary. Local anesthetics are the most widely used in dental treatment. It is, therefore, important to understand the potential effects of local anesthetics during pregnancy. In this review, we will focus on the maternal and fetal effects of local anesthetics widely used in dental treatment with consideration of the use of local anesthetics during pregnancy.

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Journal Article. Review.

**Year of Publication**
2017

**Unique Identifier**
28764309

**Title**
Death Rate of Dental Anaesthesia. [Review]

**Source**

**Status**
PubMed-not-MEDLINE

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Safi, Yaser. Department of Oral and Maxillofacial Radiology, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

**Abstract**

Death was the most important side effect of anaesthesia in dentistry. In this article we reviewed more than 20 studies with adequate data focusing on death associated with dental procedures since 1955 and found 218 deaths out of 71,435,282 patients (3 deaths per 1,000,000 persons) with the mortality rate of 1:327,684. In addition, mortality rate per million has dropped to half (6.2 per 1,000,000 vs. 3 per 1,000,000) since 1955 till the last report in 2012 without any sex predilection. In children, most cases died in the age of two to five years. Hypoxia was the most common cause of death, and cardiovascular, respiratory, and endocrine disorders, hepatic cirrhosis, septicemia, and bacterial endocarditis were the most frequent underlying systemic disease in deceased patients. Although rare death following general anaesthesia in dentistry, is a critical side effect mostly seen in patients with compromised health condition. Therefore, appropriate case selection in regard with patients' general health status as well as standard technical and equipment conditions are mandatory to diminish the risk of death during dental anaesthesia.

**Publication Type**
Journal Article. Review.

**Year of Publication**
2017

**Unique Identifier**
28663606

**Title**
Conscious Sedation: Emerging Trends in Pediatric Dentistry. [Review]

**Source**

**Status**
PubMed-not-MEDLINE

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Abstract
Dental fear and anxiety is a common problem in pediatric patients. There is considerable variation in techniques used to manage them. Various sedation techniques using many different anesthetic agents have gained considerable popularity over the past few years. Children are not little adults; they differ physically, psychologically, and emotionally. The purpose of this review is to survey recent trends and concerning issues in the rapidly changing field of pediatric sedation. We will study the topic from the perspective of an anesthesiologist. It will also provide information to practitioners on the practice of conscious sedation in dentistry and will also outline the route of administration, pharmacokinetics, and pharmacodynamics of various drugs used.

Publication Type
Journal Article. Review.
Year of Publication
2017

Unique Identifier
29509518
Title
Volume of Anesthetic Agents and IANB Success: A Systematic Review. [Review]
Source

Abstract
The aim of this study was to provide an evidence-based answer to the question: "Is 3.6-mL volume of an anesthetic agent more effective than 1.8-mL volume in providing anesthesia for mandibular molars?" Following formulation of research question and keyword selection, a comprehensive search of the following databases was conducted: Cochrane library, PubMed, Scopus, Google Scholar, ProQuest, and Clinicaltrials.gov. Three-phase eligibility appraisal and quality assessment of the studies were carried out by 2 independent reviewers. To reduce clinical heterogeneity, the included studies were divided into 2 groups: studies on healthy teeth and studies on teeth with pulpitis. The data of included studies were statistically combined through meta-analysis using a fixed-effects model. A total of 20,778 records were initially retrieved from the search. Following screening and eligibility assessment, 8 studies met the eligibility criteria and were included for qualitative synthesis. Of those, 5 studies were qualified for meta-analysis. In the irreversible pulpitis group, increasing the volume of anesthetic agent from 1.8 to 3.6 mL significantly increased the success rate of inferior alveolar nerve block (risk ratio = 2.45, 95% CI: 1.67-3.59, p < .001). However, there was insufficient evidence to draw a conclusion regarding healthy teeth.

Publication Type
Year of Publication
2018

Unique Identifier
30275140
Title
Preclinical Local Anesthesia Education in Dental Schools: A Systematic Review. [Review]
Source

Abstract
The aim of this study was to provide an evidence-based answer to the question: "Is 3.6-mL volume of an anesthetic agent more effective than 1.8-mL volume in providing anesthesia for mandibular molars?" Following formulation of research question and keyword selection, a comprehensive search of the following databases was conducted: Cochrane library, PubMed, Scopus, Google Scholar, ProQuest, and Clinicaltrials.gov. Three-phase eligibility appraisal and quality assessment of the studies were carried out by 2 independent reviewers. To reduce clinical heterogeneity, the included studies were divided into 2 groups: studies on healthy teeth and studies on teeth with pulpitis. The data of included studies were statistically combined through meta-analysis using a fixed-effects model. A total of 20,778 records were initially retrieved from the search. Following screening and eligibility assessment, 8 studies met the eligibility criteria and were included for qualitative synthesis. Of those, 5 studies were qualified for meta-analysis. In the irreversible pulpitis group, increasing the volume of anesthetic agent from 1.8 to 3.6 mL significantly increased the success rate of inferior alveolar nerve block (risk ratio = 2.45, 95% CI: 1.67-3.59, p < .001). However, there was insufficient evidence to draw a conclusion regarding healthy teeth.
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Abstract
The aim of this systematic review was to evaluate the published literature on current educational techniques used to teach local anesthesia administration in U.S. dental schools to determine the methods by which potential complications may be minimized and efficacy maximized. A PubMed search was performed in June 2017 on the following terms: (local anesthesia, education, dental) AND (Humans[Mesh]). Out of 136 articles identified, 13 met the study criteria and were included for review. Of those, the nine with outcome measures were included in the qualitative synthesis. With a quality assessment tool designed for this study, the quality of each included article was assessed independently by three of the authors. Three main pedagogies were identified: didactic instruction based on textbooks and lectures, student-to-student injections, and use of anatomic models. However, the effects of these pedagogies on local anesthesia administration efficacy, patient satisfaction, and student confidence in administering local anesthesia were largely not assessed in these studies. Quality assessment of the reviewed articles yielded a mean score of 62% (range 44-83%) for the observational studies and a mean score of 56% (range 47-63%) for the interventional studies. Due to the heterogeneity of the studies assessed, no meta-analysis could be performed. While the experimental and observational studies reviewed provided some insight into the efficacy of current educational techniques, they had numerous methodological inconsistencies. The inconsistency of the available evidence made it difficult to make fully informed curriculum recommendations based on the existing literature.

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Journal Article. Review.
Year of Publication
2018

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29179370

Title
Use of Anesthesia Providers in the Administration of Office-based Deep Sedation/General Anesthesia to the Pediatric Dental Patient.

Source

Status
MEDLINE

Authors
Anonymous.

Local Messages
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Publication Type

Year of Publication
2017

Unique Identifier
28190451

Title
Successful pulpal anesthesia for symptomatic irreversible pulpitis. [Review]

Source

Status
MEDLINE

Authors
Drum M; Reader A; Nusstein J; Fowler S.

Authors Full Name
Injectable local anaesthetic agents for dental anaesthesia. [Review] Source
Cochrane Database of Systematic Reviews. 7:CD006487, 2018 07 10.
VI 1
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Abstract
BACKGROUND: Pain during dental treatment, which is a common fear of patients, can be controlled successfully by local anaesthetic. Several different local anaesthetic formulations and techniques are available to dentists. OBJECTIVES: Our primary objectives were to compare the success of anaesthesia, the speed of onset and duration of anaesthesia, and systemic and local adverse effects amongst different local anaesthetic formulations for dental anaesthesia. We define success of anaesthesia as absence of pain during a dental procedure, or a negative response to electric pulp testing or other simulated scenario tests. We define dental anaesthesia as anaesthesia given at the time of any dental intervention. Our secondary objective was to report on patients’ experience of the procedures carried out.
SEARCH METHODS: We searched the Cochrane Central Register of Controlled Trials (CENTRAL; the Cochrane Library; 2018, Issue 1), MEDLINE (OVID SP), Embase, CINAHL PLUS, WEB OF SCIENCE, and other resources up to 31 January 2018. Other resources included trial registries, handsearched journals, conference proceedings, bibliographies/reference lists, and unpublished research.
SELECTION CRITERIA: We included randomized controlled trials (RCTs) testing different formulations of local anaesthetic used for clinical procedures or simulated scenarios. Studies could apply a parallel or cross-over design.
DATA COLLECTION AND ANALYSIS: We used standard Cochrane methodological approaches for data collection and analysis.
MAIN RESULTS: We included 123 studies (19,223 participants) in the review. We pooled data from 68 studies (6615 participants) for meta-analysis, yielding 23 comparisons of local anaesthetic and 57 outcomes with 14 different formulations. Only 10 outcomes from eight comparisons involved clinical testing. We assessed the included studies as having low risk of bias in most domains. Seventy-three studies had at least one domain with unclear risk of bias. Fifteen studies had at least one domain with high risk of bias due to inadequate sequence generation, allocation concealment, masking of local anaesthetic cartridges for administrators or outcome assessors, or participant dropout or exclusion. We reported results for the eight most important comparisons. Success of anaesthesia: When the success of anaesthesia in posterior teeth with irreversible pulpitis requires root canal treatment is tested, 4% articaine, 1:100,000 epinephrine, may be superior to 2% lidocaine, 1:100,000 epinephrine (31% with 2% lidocaine vs 49% with 4% articaine; risk ratio (RR) 1.60, 95% confidence interval (CI) 1.10 to 2.32; 4 parallel studies; 203 participants; low-quality evidence). When the success of anaesthesia for teeth/dental tissues requiring surgical procedures and surgical procedures/periodontal treatment, respectively, was tested, 3% prilocaine, 0.03 IU felypressin (65% with 3% prilocaine vs 76% with 2% lidocaine; RR 0.86, 95% CI 0.79 to 0.95; 2 parallel studies; 907 participants; moderate-quality evidence), and 4% prilocaine plain (71% with 4% prilocaine vs 83% with 2% lidocaine; RR 0.86, 95% CI 0.75 to 0.99; 2 parallel studies; 228 participants; low-quality evidence) were inferior to 2% lidocaine, 1:100,000 epinephrine. Comparative effects of 4% articaine, 1:100,000 epinephrine and 4% articaine, 1:200,000 epinephrine on success of anaesthesia for teeth/dental tissues requiring surgical procedures are uncertain (RR 0.85, 95% CI 0.71 to 1.02; 3 parallel studies; 930 participants; very low-quality evidence). Comparative effects of 0.5% bupivacaine, 1:200,000 epinephrine and both 4% articaine, 1:200,000 epinephrine (odds
Electroconvulsive therapy (ECT) is the treatment method widely used in psychiatric disorders such as depression, bipolar disorder, schizophrenia and schizoaffective disorder. The advantage of ECT is therapeutic response that occurs significantly earlier than during pharmacotherapy. Initially ECT was used without anesthesia. Then, in the 1950s procedures with general anesthesia were introduced to reduce the complications that may occur during a seizure caused by ECT, such as broken bones, teeth, tendon rupture, muscle damage. Currently, in general anesthesia for ECT several medications are used interchangeably: thiopental, propofol, etomidate and ketamine. In different resorts and different countries different anesthetics are used, the choice is determined mainly by the experience of each resort and a kind of tradition. The authors provide an overview of objective data showing how various anesthetics affect the quality of ECT and the presence of any hemodynamic complications after ECT. Selection of articles included in this paper was made by searching Medline and PubMed databases using specific keywords: electroconvulsive therapy, general anesthesia, the risks and benefits of thiopental, ketamine, propofol and etomidate. The results of this review are inconclusive when it comes to the effect of intravenous anesthetics on the quality of the ECT treatment and side effects relating to respiratory and cardiovascular system. On this basis it is impossible to determine which of intravenous anesthetics is most advantageous from the point of view of the patient. To develop the optimum scheme of anesthesia for ECT, it is necessary to conduct further, methodologically correct studies.
Effectiveness and safety of oral sedation in adult patients undergoing dental procedures: protocol for a systematic review.

**Source**

**Status**
MEDLINE

**Authors**
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**Abstract**
INTRODUCTION: The management of anxious patients undergoing dental procedures is still a challenge in clinical practice. Despite a wide variety of drugs for oral sedation in adult patients, there are relatively few systematic reviews that compare the effectiveness and safety of different drugs administered via this route. Thus, this study will evaluate the effectiveness and safety of oral sedation with benzodiazepines and other agents to patients undergoing dental surgical procedures.

METHOD/DESIGN: We will conduct a systematic review and, if appropriate, a meta-analysis of randomised controlled clinical trials that will evaluate the use of conscious sedation administered orally to adult patients undergoing oral surgery. The search will be conducted using electronic databases, such as the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (via Ovid), EMBASE (via Ovid), CINAHL (via Ovid), Lilacs (SciELO) and Capes database, without restriction of languages or date of publication. Primary outcomes include anxiety, sedation, treatment satisfaction, pain and adverse effects. Secondary outcomes include vital parameters (heart rate, respiratory rate and blood pressure) and patient cooperation during intervention. A team of reviewers will independently assess each citation for eligibility and in duplicates. For eligible studies, the same reviewers will perform data extraction, risk of bias assessment and determination of the overall quality of evidence using the Grading of Recommendations Assessment, Development and Evaluation classification system.

ETHICS AND DISSEMINATION: The evidence gathered from this study should provide dental surgeons with knowledge on the effectiveness and safety of oral sedation in adults requiring dental surgical procedures. This in turn should contribute towards the decision-making process in dental practice, minimising the risks of anxiety and ineffective pain control in clinical procedures, as well as possible side effects. Ethics approval is not required in protocols for systematic reviews. The systematic review will be published in a peer-reviewed journal and presented at conferences.

**PROSPERO REGISTRATION NUMBER:** CRD42017057142.

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**Publication Type**
Comparative Study. Journal Article. Review.

**Year of Publication**
2018

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**Title**
Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016.

**Source**

**Status**
MEDLINE

**Authors**
Anonymous.

**Local Messages**
Abstract

The safe sedation of children for procedures requires a systematic approach that includes the following: no administration of sedating medication without the safety net of medical/dental supervision, careful presedation evaluation for underlying medical or surgical conditions that would place the child at increased risk from sedating medications, appropriate fasting for elective procedures and a balance between the depth of sedation and risk for those who are unable to fast because of the urgent nature of the procedure, a focused airway examination for large (kissing) tonsils or anatomic airway abnormalities that might increase the potential for airway obstruction, a clear understanding of the medication's pharmacokinetic and pharmacodynamic effects and drug interactions, appropriate training and skills in airway management to allow rescue of the patient, age- and size-appropriate equipment for airway management and venous access, appropriate medications and reversal agents, sufficient numbers of staff to both carry out the procedure and monitor the patient, appropriate physiologic monitoring during and after the procedure, a properly equipped and staffed recovery area, recovery to the presedation level of consciousness before discharge from medical/dental supervision, and appropriate discharge instructions. This report was developed through a collaborative effort of the American Academy of Pediatrics and the American Academy of Pediatric Dentistry to offer pediatric providers updated information and guidance in delivering safe sedation to children.

Publication Type


Year of Publication

2017
INTRODUCTION: The use of vasoconstrictors combined with local anaesthetics (LAs) in dentistry for patients with cardiovascular disease (CVD) is still controversial in the scientific literature. It raises concerns regarding the possibility of transient episodes, triggering negative cardiovascular outcomes.

METHOD/DESIGN: Trials eligible for our systematic review will enrol patients with CVD who have undergone dental treatments carried out with the use of LAs by comparing two arms: LAs with vasoconstrictors and LAs without vasoconstrictors. The research will be conducted in the electronic databases, namely Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, Healthstar (via Ovid), Cumulative Index to Nursing and Allied Health Literature and Web of Science, from their inception to December 2017, without any restrictions in terms of language and status of publication. A team of reviewers will independently assess titles, abstracts and complete text to determine eligibility. For eligible studies, the same reviewers will perform data extraction and evaluate the risk of bias in the selected articles. The selected outcomes comprise death, mortality by a specific cause, stroke, acute myocardial infarction, hospitalisation, pain, bleeding, arrhythmias, ischaemic episodes, anxiety, adverse effects, changes in blood pressure, changes in heart rate, anxiety and results obtained via oximetry. Whenever possible, we will conduct a meta-analysis to establish the effects of LAs with and without vasoconstrictors in the patients with CVD, and the overall quality of evidence for each outcome will be determined using the Grading of Recommendations Assessment, Development and Evaluation classification system.

ETHICS AND DISSEMINATION: Ethics committee approval was not necessary because this is a protocol of systematic review. This systematic review will be submitted for presentation at conferences and for publication in a peer-reviewed journal. Our review will assess the risks of cardiovascular events when using LAs with and without vasoconstrictors in patients with CVD, focusing on important clinical outcomes.

PROSPERO REGISTRATION NUMBER: CRD42016045421.
will continue to have a significant effect on the training of oral and maxillofacial surgery residents regarding anesthesia. The outcome of these changes can have a major effect on the specialty of oral and maxillofacial surgery and a cornerstone of the profession.

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Title
Nitrous Oxide and Midazolam Sedation: A Systematic Review and Meta-Analysis. [Review]
Source

Abstract
Nitrous oxide and midazolam have been used as sedative agents to decrease fear and anxiety associated with dental procedures. Although these agents have been widely used individually, the combination of the two is also commonly used. Four clinical trials were identified that compared the combination technique with the individual use of the drugs. The standardized mean difference (SMD) for each outcome measure was considered for final analysis. Three studies with 534 participants were included in the final meta-analysis, and the SMD [95% CI] was obtained as -0.15 [-0.32, 0.03] and was not statistically significant for cooperation scores. Two studies reported the dose of midazolam required for inducing sedation in 450 participants, and the pooled estimate of SMD [95% CI] was obtained as -0.29 [-0.48, -0.10] and was significant. Two studies with 450 participants reported the time taken to recover from sedation, and the pooled estimate of SMD [95% CI] was obtained as -0.20 [-0.39, -0.01] and favored the combination technique. To conclude, the combination technique combines the pros and cons of both drugs in causing fewer adverse effects due to midazolam by reducing the total dose and also helps to provide better acceptance of nitrous oxide inhalation.
Title
A Review of the use of Flumazenil for the Reversal of Midazolam Conscious Sedation in Dentistry. [Review]
Source
VI 1
Status
MEDLINE
Authors
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Folland, Laurence; Brown, Emma; Boyle, Carole.
Local Messages
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Abstract
The practice of midazolam conscious sedation is well established in dentistry. The drug flumazenil is a specific benzodiazepine antagonist and is an essential requirement in settings where midazolam is used. A literature review has been carried out, examining the available information regarding flumazenil's safety, administration, potential complications and the regulatory documentation which governs its use. Flumazenil is a safe drug to use for the reversal of midazolam induced conscious sedation although the evidence surrounding its use is limited.
Publication Type
Journal Article. Review.
Year of Publication
2017
Abstract
Capnography monitoring during conscious sedation is not currently required for dentistry in Britain and Ireland. Other countries have introduced guidelines and standards requiring capnography monitoring for procedural sedation. This review highlights the variability of procedural sedation including the setting, the position on the sedation continuum, and the routine use of supplemental oxygen. Specific research is required for conscious sedation in a dental setting to support standards and guidelines with regard to capnography monitoring. The Academy of Medical Royal Colleges and their Faculties emphasise that each specialty must produce its own guidance for the use of sedative techniques.1 Clinical practice guidelines for the monitoring and safe practice of sedation vary by specialty and institution. Standards are generally set from the best available evidence based research. There is a growing body of literature that recognises the potential additional value of capnography (ETCO2) monitoring during procedural sedation in different settings and for different sedation techniques.2-5 In these studies, capnography reduced the incidence of hypoxaemia during procedural sedation. A meta-analysis published by Waugh et al. (2010) concluded that end-tidal carbon dioxide monitoring is an important addition in detecting respiratory depression during procedural sedation.6 A more recent systematic review by Conway et al. (2016) concluded that patients monitored with capnography in addition to standard monitoring had a reduced risk of hypoxaemia compared to those with only standard monitoring.7 However, it has to be noted that both the Waugh and Conway reviews contained substantial statistical heterogenicity which is likely to affect the quality of the evidence. As research evidence for capnography monitoring from the medical settings studied became available, new standards for capnography monitoring were introduced in several countries (Table 1).

METHODS: A comprehensive search was conducted to identify articles which were assessed against inclusion criteria before data extraction. Studies involving children under 16 years, having treatment for dental caries under GA, were considered eligible. Included studies were quality assessed.

RESULTS: Twenty studies were included, which demonstrated significant heterogeneity. Most studies employed a pre-test-post-test design. All but one study relied on proxy reports of OHRQoL. Only half the studies used instruments validated in the study population. Whereas all studies reported improved OHRQoL overall, some subscales showed changes which were not significant or worsened OHRQoL. The scientific quality of the studies varied considerably.

CONCLUSION: Heterogeneity of included papers limited the conclusions which could be drawn. Treatment under GA appears to result in overall improvements in proxy reported OHRQoL; however, there is a need for further high-quality studies employing validated, child-reported measures of OHRQoL.

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Outpatient Anesthetic Safety Considerations for Obstructive Sleep Apnea. [Review]


Abstract

Most patients with obstructive sleep apnea (OSA) are not diagnosed preoperatively. The STOP-Bang questionnaire may identify patients at risk of OSA, especially those with severe OSA. Patients with mild to moderate OSA, with optimized comorbidities, can usually safely undergo outpatient surgery. Patients with severe OSA, who are not optimized medically, should avoid outpatient surgery.

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Simulation Training for the Office-Based Anesthesia Team. [Review]


Abstract

An OMS office is a complex environment. Within such an environment, a diverse scope of complex surgical procedures is performed with different levels of anesthesia, ranging from local anesthesia to general anesthesia, on patients with varying comorbidities. Optimal patient outcomes require a functional surgical and anesthetic team, who are familiar with both standard operational principles and emergency recognition and management. Offices with high volume and time pressure add further stress and potential risk to the office environment. Creating and maintaining a functional surgical and anesthetic team that is competent with a culture of patient safety and risk reduction is a significant challenge that requires time, commitment, planning, and dedication. This article focuses on the role of simulation training in office training and preparation.

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**RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION**

**Source**

**VI 1**

**Status**
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Comment on: Anesthesiology. 2018 Jan;128(1):11-26; PMID: 29116945

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Journal Article. Comment.

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**Title**
Effect of preoperative oral analgesics on pulpal anesthesia in patients with irreversible pulpitis—a systematic review and meta-analysis. [Review]

**Source**

**Authors**
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**Comments**
Comment in: J Am Dent Assoc. 2017 May;148(5):e47; PMID: 28449751

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**Abstract**
OBJECTIVES: The objectives of this study were to assess the efficacy of preemptive oral administration of single dose of non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen on the local anesthetic success in adults with irreversible pulpitis and to find the possible covariates that could predict treatment effect.

MATERIALS AND METHODS: A systematic search using electronic databases up to March 2015 was conducted. Odds ratio (OR) and 95% confidence intervals (CIs) were estimated using random and fixed-effect inverse variance method. Subgroup and meta-regression analyses were conducted to assess the potential source of heterogeneity.

RESULTS: Results showed that preemptive analgesics are more effective than placebo in increasing anesthetic success (OR = 0.30, CI% 0.24-0.39, p = 0.000) [Q = 55.860 (p = 0.001)]. In the subgroup analysis, administration of NSAIDs as monotherapy, ibuprofen as mono- vs. combination therapy, oxicam type drugs as monotherapy, and acetaminophen as combination therapy were significantly more effective in increasing anesthetic success OR = 0.25, CI% 0.16-0.38, p = 0.00, Q = 12.833 (p = 0.011); OR = 0.48, CI% 0.30-0.74, p = 0.002, Q = 15.898 (p = 0.14); OR = 0.30, CI% 0.16-0.38, p = 0.001, Q = 7.506 (p = 0.02); OR = 0.10, CI% 0.16 0.38, p = 0.001, Q = 5.075 (p = 0.07), respectively. However, there was no significant difference in increasing anesthetic success between treatment and placebo arms when acetaminophen...
was administered alone. In meta-regression analysis, an association between different types of NSAIDs (indomethacin, diclofenac potassium, and oxicam-type drugs) and articaine with treatment effect was observed.

CONCLUSIONS: The administration of preemptive analgesics can induce superior intraoperative analgesia for patients with irreversible pulpitis. However, strategies such as co-administration of certain types of analgesics and anesthetic solution might be predictors of treatment effect. Additionally, there was no association between different timing and dosage of analgesics and treatment effect.

CLINICAL RELEVANCE: When compared to placebo, preemptive oral analgesics are superior in achieving anesthetic success in inflamed pulp.

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A Review of Current Literature of Interest to the Office-Based Anesthesiologist.

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Comment on: Anesth Analg. 2017 May;124(5):1447-1449; PMID: 27984222

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Comment on: Anesthesiology. 2017 Feb;126(2):234-248; PMID: 27922839
Comment on: Anesthesiology. 2016 Aug;125(2):295-303; PMID: 27275669
Comment on: Anesthesiology. 2017 Mar;126(3):376-393; PMID: 28045707
Type 2 diabetes is a disease of metabolism in which the afflicted patient cannot properly utilize carbohydrates, fats, and proteins. Because the prevalence of type 2 diabetes is rapidly increasing throughout the general population, anesthesia providers must realize that a significant percentage of their patients will present with the disease. Anesthesia providers should have an intimate knowledge of the comorbidities and complications that are associated with type 2 diabetes and know the specific pharmacokinetics and pharmacodynamics of the drugs used to treat the disease. Part 1 of this series on the anesthetic management of type 2 diabetes in the ambulatory theater addressed the pathology of diabetes and its comorbid disease states. Part 2 of the series now focuses on the pharmacology associated with the many medications used to treat the disorder and the most recent guidelines for blood glucose management recommended for patients in an ambulatory surgery setting.

Mitochondrial disease (MD) represents a category of metabolic disorders with a wide range of symptoms across a variety of organ systems. It occurs with an incidence of greater than 1:5000 and can be difficult to specifically diagnose because of the variety of clinical presentations and multiple genomic origins. Although phenotypically variable, MD symptoms often include hypotonia, cardiac defects, dysautonomia, and metabolic dysfunction. Mitochondrial disease presents a unique challenge in terms of anesthetic management, as many anesthetic drugs suppress mitochondrial function. Additional considerations may need to be made in order to evaluate the patient's metabolic compensation prior to surgery. This article presents an in-depth discussion of a case involving a nearly 10-year-old boy with a history of an unspecified form of MD, who presented for endodontic treatment of tooth No. 30 under deep sedation. The article also provides a thorough review of the current literature surrounding the anesthetic management of patients with MD.
Recent advances and perspectives in topical oral anesthesia. [Review]

Franz-Montan M; Ribeiro LNM; Volpato MC; Cereda CMS; Groppo FC; Tofoli GR; de Araujo DR; Santi P; Padula C; de Paula E.

Abstract

BACKGROUND: Topical anesthesia is an important means of achieving tooth extraction in order to facilitate dental treatment. Recently, there have been considerable developments in the area of topical anesthesia, especially regarding the use of different substances and methods.

AIM: To provide a review of the advances in topical anesthesia and discuss future perspectives.

METHODS: A systematic review of the literature was conducted using PubMed, Scopus, and Google Scholar databases.

RESULTS: There were a total of 155 publications identified, of which 55 were selected for inclusion. The most commonly used agents were benzocaine, lidocaine, and xylocaine. However, recent studies have shown that these agents have potential side effects such as taste modification, allergy, and cardiovascular effects.

CONCLUSION: New developments in topical anesthesia include the use of anti-inflammatory agents and the combination of local anesthetics with other agents to reduce side effects. Future perspectives include the development of novel anesthetic agents with improved efficacy and safety profiles.

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**Abstract**

Topical anesthesia is widely used in dentistry to reduce pain caused by needle insertion and injection of the anesthetic. However, successful anesthesia is not always achieved using the formulations that are currently commercially available. As a result, local anesthesia is still one of the procedures that is most feared by dental patients. Drug delivery systems (DDSs) provide ways of improving the efficacy of topical agents. Areas covered: An overview of the structure and permeability of oral mucosa is given, followed by a review of DDSs designed for dental topical anesthesia and their related clinical trials. Chemical approaches to enhance permeation and anesthesia efficacy, or to promote superficial anesthesia, include nanostructured carriers (liposomes, cyclodextrins, polymeric nanoparticle systems, solid lipid nanoparticles, and nanostructured lipid carriers) and different preformulated dosage forms (patches, bio- and mucoadhesive systems, and hydrogels). Physical methods include pre-cooling, vibration, iontophoresis, and microneedle arrays. Expert opinion: The combination of different chemical and physical methods is an attractive option for effective topical anesthesia in oral mucosa. This comprehensive review should provide the readers with the most relevant options currently available to assist pain-free dental anesthesia. The findings should be considered for future clinical trials.

**Title**

Effects of Hypotensive Anesthesia on Reducing Intraoperative Blood Loss, Duration of Operation, and Quality of Surgical Field During Orthognathic Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. [Review]

**Source**


**Authors**

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**Purpose**

The objective of this study was to evaluate the efficacy of hypotensive anesthesia in reducing intraoperative blood loss, decreasing operation time, and improving the quality of the surgical field during orthognathic surgery. A systematic review and meta-analysis of randomized controlled trials addressing these issues were carried out.

**Materials and Methods**

An electronic database search was performed. The risk of bias was evaluated with the Jadad Scale and Delphi List. The inverse variance statistical method and a random-effects model were used.

**Results**

Ten randomized controlled trials were included for analysis. Our meta-analysis indicated that hypotensive anesthesia reduced intraoperative blood loss by a mean of about 169 mL. Hypotensive anesthesia was not shown to reduce the operation time.
time for orthognathic surgery, but it did improve the quality of the surgical field. Subgroup analysis indicated that for blood loss in double-jaw surgery, the weighted mean difference favored the hypotensive group, with a reduction in blood loss of 175 mL, but no statistically significant reduction in blood loss was found for anterior maxillary osteotomy. If local anesthesia with epinephrine was used in conjunction with hypotensive anesthesia, the reduction in intraoperative blood loss was increased to 254.93 mL.

CONCLUSIONS: Hypotensive anesthesia was effective in reducing blood loss and improving the quality of the surgical field, but it did not reduce the operation time for orthognathic surgery. The use of local anesthesia in conjunction with hypotensive general anesthesia further reduced the amount of intraoperative blood loss for orthognathic surgery.