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Systematic Review of Drug Control and Management of Pain and Anxiety in Endodontic Treatment

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Abstract

The aim of this article is to improve the understanding of pharmacology and procedures for the control of pain and anxiety in endodontic treatment. The methodology was performed through an epidemiological survey in the main research databases and some articles with high impact factor were selected for a systematic review of the management of pain and anxiety in endodontic treatments. A scan was performed in PubMed, Scielo and Capes e were found 30 articles related to the theme, 5 with bias inadequate to research and 7 with impact factor or which are much below average. These 12 articles were excluded from the review process, leaving 18 articles that were used as basis for this study. As a result, it is understood that the etiology of pain felt by the patient will help the dentist determine when to do an action. Proper management helps the patient, reducing fear and pain and consequently decreasing the number of infections and inflammations. It is then concluded that the treatment plan includes pain control before, during and after and it is crucial to determine the drug effects that will be recommended for patients.

Keywords: Endodontic treatment; Pain management; Anxiety; Endodontic medication

Introduction

One of the goals of endodontic treatment is to prevent and eliminate the pain in patients. During treatment many patients will feel anxious knowing that they will feel some kind of pain in addition to the pain they are already feeling [1,2]. The use of local anesthetic reduces and decreases pain threshold, but in post-treatment is quite common, especially in patients who have reported pain before treatment [1,2]. Some dentists report that managing the patient's pain can be a difficult thing, especially during endodontic treatment. Patients who undergo pulpectomy or treatment of symptomatic periodontitis experience central sensitization (increased excitability of central nervous system) and peripheral sensitization [1,3,4].

Inadequate management of pain during endodontic treatment may be caused by changes in periapical tissues, inflammation or infection of the pulp and apical pathology that may lower the pH of the tissue in the area around the teeth [5]. Pain anxiety usually arises during treatment and not in the post-treatment period. Although pain control in endodontic treatment is not always difficult to circumvent, how it can be done through intra-pulp injections causes enormous discomfort in patients [3]. The aim of this study is to improve knowledge of pharmacology, pain, anxiety and management in endodontic treatment.

Methods

Study design

This is a study of secondary originality, since it seeks to establish conclusions from primary studies, with records common to them. It has retrospective directionality because it is a study that performs the record of the past, and is followed from that moment to the present. It has a profile of epidemiological and descriptive evaluation, as it is a study that describes the characterization of semiological, etiological and pathophysiological aspects.

Population studied

Because it is an article of secondary originality and aims to review the literature on the subject, there is no defined study population. Generally, it can be affirmed that the study population are people with toothache and have had their cases reported in the literature at some point.

As an inclusion and exclusion criterion, a scan was performed in the Pubem, Scielo and Capes platform behind articles related to pain and pain management in endodontics. We found 30 articles related to the topic, 5 with inadequate bias to the research in question and 7 with impact factor or qualis inferior to B2. These 12 articles were excluded from the review process, leaving 18 articles that were used as the basis for this study.

Procedures

A scan was performed on PubeMed, Scielo and Capes platform behind articles related to pain and pain management in endodontics. Of the 30 articles found, 18 were used in this review literature review. Because it is a theoretical review of literature, there was no need to request the opinion of the research ethics committee.

Research instrument

Some great indexing portals for scientific articles, PubMed, Scielo and Capes platform were used as tools for this research.

PubMed is a free access search engine to the MEDLINE database of citations and abstracts of biomedical research articles. Offered by the National Library of Medicine of the United States as part of Entrez. MEDLINE has around 4,800 journals published in the United States and in more than 70 countries around the world from 1966 to the present day.

Scientific Electronic Library Online (SciELO) is a free access digital library and cooperative model of digital publication of Brazilian scientific journals, the result of a research project of the Foundation for Research Support of São Paulo (FAPESP) in partnership with the Latin American and Caribbean Center for Health Sciences Information - Bireme. Since 2002, it has the support of the National Council for Scientific and Technological Development – CNPq.

The project aims to develop a common methodology for the preparation, storage, dissemination and evaluation of scientific production in electronic format. The following countries are currently participating in the SciELO network: South Africa, Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Spain, Mexico, Peru, Portugal, Uruguay, Venezuela; prepare the participation: Ecuador.

The Portal of Periodicals, of the Coordination for the Improvement of Higher Education Personnel (Capes), is a virtual library that gathers and makes available to teaching and research institutions in Brazil the best of international scientific production. It has a collection of more than 45 thousand titles with full text, 130 reference bases, 12 bases dedicated exclusively to patents, as well as books, encyclopedias and reference works, technical standards, statistics and audiovisual content.

Results

Studies demonstrate effective and easy strategies to manage pain in teeth that will be, have been or are being treated endodontically. A fairly effective and efficient guidelines system is called 3D Pain Treatment: diagnosis, dental treatment and drugs [6].

Diagnosis

Process of identifying an abnormal disease or condition [7]. Collection and assessment of any initial signs or symptoms experienced by the patient and which may subsequently assist in producing a comprehensive case investigation [8]. Without proper diagnosis, clear, precise and effective, the dental surgeon cannot treat or provide adequate care [8]. Diagnosis can often be made clinically, when pulp exposure is observed, however x-ray diagnosis is the most appropriate [9].

Dental treatment

The main treatments performed to reduce pain include root canal treatment and Exodontia [9]. Both are very effective in reducing the pain and discomfort of patients because the source of the pain that is the nerve is excised [10]. Exodontia is considered a multilateral procedure and should only be done in the latter case, however with the advent and popularization of implantology has greatly increased the number of tooth extractions that could still be treated endodontically [11].

Drugs

It is a way to soften the tooth pain. The prescription of analgesics or anti-inflammatories such as nimensulide and Dexamethasone are very effective in the control of pain after endodontic treatment but they present low effectiveness in the control of the pain of teeth with pulp exposures that were not treated. Analgesics and anti-inflammatories also present good clinical applicability as prophylaxis before endodontic treatment, reducing the original intensity of the pain and having a good response in the endodontic treatment post [12]. The application of local anesthetics and correct use of the anesthetic technique are fundamental for a tranquil transoperative without trauma to the patient [12].

Psychological approaches include the so-called 4C, knowing, communication, concern and trust [13].

Discussion

Accurate diagnosis and control of pain are essential; there may be many situations where pain does not come from the teeth, so it is important to know the etiology and etiopathogenesis of toothache and pain that come from the surrounding tissues. Determining if the pain comes from the teeth is one of the most important phases that the dentist surgeon should be able to notice about the patient's primary complaint by examining the suspected teeth by percussion with the handle of the buccal mirror or by using cold spray. These techniques are important and consecrated in the literature to know if the origin of the pain comes from the teeth or not [14].

If odontalgia is diagnosed, it is necessary to identify if there is already or not a pulp exposure. This type of diagnosis can be done clinically or through a periapical x-ray [14]. In case of exposure, the treatment of choice is endodontic treatment [15].

Channel treatment is considered effective in reducing pain and discomfort that comes from inflammation and increased mediators such as bradykinin, prostaglandins, and oxytocin [6]. Endodontic treatment in a tooth with irreversible pulpitis and apical periodontitis may present a considerable level of pain to the patient. Age, sex and duration of treatment are factors associated with increased risk of pain experienced during endodontic treatment procedures [1]. Pathological inflammation or infection of the pulp may decrease the pH of the tissue around the teeth. The degree of decreased pH of the surrounding tissue will reduce the effects of anesthesia because more RNH + ion is formed than RN. RNH + ions cannot migrate through the neural network so that the effects of anesthesia are drastically reduced [3]. A method to obtain tissue anesthesia with decreased pH is by depositing a larger volume of anesthetic in the inflamed area, so that it may have higher levels of NB within the neural network [3].

Anesthesia failure frequently occurs in endodontics, factors such as poor choice of anesthetic technique, error of the applied technique and unfavorable local conditions for anesthetic flow are the main pain factors during endodontic treatment [16]. Other factors that also present a high prevalence of pain during endodontic treatment are the inadequate management of clinical management. Bursting of the apical foramen during cleaning and modeling, very vigorous washing of the root canal, pushing several irritants into the periapical tissue, can cause intraoperative pain and quite possibly postoperative pain [16].

Some research suggests that prophylaxis with anti-inflammatories and analgesics may have a positive effect on patients' pain control during endodontic and postoperative treatment, this strategy tends to inhibit or reduce pre-existing inflammation, therefore, it becomes an effective strategy and comfortable to the patient for pain management [6]. The combination of pre-treatment and anesthetic NSAIDs can produce 70% decrease in pain after endodontic treatment [10].

Anti-inflammatories inhibit mediators of inflammation, thus reducing pain, especially after instrumentation, which can cause moderate to severe pain during and after treatment. A combination of paracetamol and dexamethasone are the most commonly reported options for relieving moderate and severe pain after instrumentation. However, the clinician should understand that there are contraindications for patients with ulcer, ulcerative colitis, uncontrolled hypertension and patients with renal disease or in the third trimester of pregnancy [16].

One of the goals of endodontic treatment is to prevent or eliminate pain, although procedures can be done without local anesthesia in some cases, studies suggest mild pain after chemo-mechanical preparation, 16% reported a correlation between pain and anxiety [2]. Generally anxiety can be controlled with a frank conversation between patient and dental surgeon. In this conversation the professional has to clarify all the doubts of the patient, explain the details of the procedure and pass trust and safety [2]. There are extreme cases that only the conversation will not solve the problem of anxiety and in these cases it may be necessary to use medications that control these levels of anxiety. Benzodiazepine medications are very effective in this type of situation and can be used before the procedure [2].

In dentistry, we prefer the minor tranquilizers of the benzodiazepine group, which are indicated in cases of patients who are rebellious or fearful of the treatment or in pre-anesthetic sedation and as an aid in the control of pain. The benzodiazepines most commonly used in dentistry are: diazepam, lorazepam and bromazepam.

The best alternative for elderly patients is short-acting benzodiazepines, such as lorazepam, which can be given as a pre-anesthetic medication in a single dose of 1 mg or 2 mg, 2 hours before the intervention. For schoolchildren, diazepam is of great value because of its specific anxiolytic properties. The dose of 0.15 to 0.3 mg/kg body weight orally is sufficient for most patients, the effects being observed after 45 to 60 minutes of drug ingestion. In case of very anxious patients, take the tranquilizer, if diazepam or bromazepam, in a single dose, 1 hour before oral treatment, or, if lorazepam, 2 hours before the consultation; if the patient is very nervous, it is also advisable to take a tablet the day before treatment, preferably at bedtime [14,17,18].

Conclusion

The control of toothache caused by pulpal inflammation is a common clinical problem, so the effectiveness of pain control begins with the determination of an accurate diagnosis; the treatment plan includes control of pain before, during and after treatment and determine the effects of drugs. Medications such as anti-inflammatories and analgesics are quite efficient for the control of pain before and after endodontic treatment, however they do not have lasting efficacy until the tooth has had its pulp removed and the root canal instrumented. Anxiolytics have a good efficacy for the control of anxiety in patients who present phobia to endodontic treatment.

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