

NEW PERSPECTIVE ARTICLE

Preventive Analgesia: An Evidence-Based Alternative for Dentistry Analgésia Preventiva: Una alternativa basada en evidencia para odontología

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ABSTRACT

The effective management of pain in dentistry increases the patient satisfaction, improves the treatment outcome and reduces the cost of care. To achieve this goal, different strategies are available for the administration of analgesics, such as preventive analgesia. The aim of this approach is to minimize sensitization induced by noxious perioperative stimuli (both pre, intra and postoperative). Available research support the favorable effect of preventive analgesia, although it also recognizes an important lack of high quality evidence to confirm its advantages. This new perspective article summarizes the preventive analgesia protocol, and its potential use in dentistry.

KEYWORDS

Preventive analgesia; Analgesics; Pain management; Dental pain.

RESUMEN

El manejo eficaz del dolor en odontología aumenta la satisfacción del paciente, mejora los resultados del tratamiento y reduce el costo de la atención. Para alcanzar esta meta, existen diferentes estrategias en la administración de analgésicos, como la analgesia preventiva. El objetivo de este enfoque es minimizar la sensibilización inducida por los estímulos perioperatorios nocivos (tanto pre, intra y postoperatorios). Los estudios apoyan el efecto favorable de la analgesia preventiva, aunque también reconocen una importante carencia de evidencia de alta calidad para confirmar sus ventajas. Este artículo de nueva perspectiva resume el enfoque de la analgesia preventiva y su potencial uso en odontología.

PALABRAS CLAVE

Analgésia preventiva; Analgésicos; Manejo del dolor; Dolor dental.

Successful pain management in the dental office is a daily task for all clinicians. From the diagnosis, going through the anesthetic blockade and performance of the clinical procedure, to the final recommendations and follow-up period; the dentist goal is to offer the best results under a comfortable scenario. Classically, pharmacological approach is employed after all interventions are done. Only when the patient left the dental chair, the clinician consider if any prescription must be written. But, what happen if the prescription can be included before/during/immediately after the procedure? What if the real advantage of analgesics is not after, but as a part of the treatment itself?. This brief review will summarize the importance of preventive analgesia in dentistry.

PREVENTIVE ANALGESIA: THE CONCEPT

Preventive analgesia broadly refers to any regimen given at any time during the perioperative period that is able to control pain-induced sensitization (1), completely blocking any pain signals from the surgical wound from the time of incision until final wound healing (2). This alternative may be useful not only for those patients where the central sensitization due to surgery wants to be avoided, but also to those were preexisting pain may have even more intense pain in the postoperative period (1). Surgical incisions or several clinical procedures may favors both peripheral and central sensitization (or centrally mediated pain) in a patient who has no history of preoperative pain, or also after long-period of unrelieved preoperative pain. Peripheral sensitization occurs when inflammatory mediators released at the wound site, decrease the threshold of terminal nerve endings and thus favoris nociception (3). Instead, in central sensitization the membrane excitability and synaptic efficacy are increased due to long lasting or severe nociception, or inflammation of neural injury that favors hyperexcitability of the neurons in the dorsal horn. In such cases, pain can be elicited

by innocuous stimuli (allodynia) and can last even in the absence of an apparent cause(2). It is not mandatory that preventive analgesic intervention must be initiated before surgery; the timing may be during the procedure or even immediately after (4). Because of this last issue, many therapies that can be classified as “preventive”, are erroneously omitted or discarded as such.

According to Rosero & Joshi (3) three main requirements are needed to achieve preventive analgesia. First, the real diminishing of the post-operative pain; second, a diminishing of the period of postoperative analgesic requirements compared to placebo (5); and third, that the duration of the effect of the intervention exceeds the clinical duration of action of the target drug. Considering these factors, it is evident that preventive analgesia is not a simple dosage regimen but a complex strategy.

PREVENTIVE VS PRE-EMPTIVE ANALGESIA: WHAT IS THE DIFFERENCE?

Pre-emptive analgesia is consider by different authors as an old terminology (1) that may be abandoned and instead replaced by the term preventive analgesia (2). Pre-emptive analgesia refers to the analgesic intervention that only preceded a surgical injury, and was supposed to be more effective in relieving acute postoperative pain that the same treatment following surgery (6). It means, that if the central sensitization is produced by the surgical incision itself a single analgesic should inhibit such consequence, and therefore, will diminish the odds to suffer postoperative chronic pain; or simply to suffer the physiological consequences of the procedure (2). Under this protocol, the key factor will be the moment or timing of pharmacological intervention, and not the quality or mechanism employed (4), different to the preventive analgesia concept.

However, according to Hurley and Wu (1) timing of the intervention is not as important as

other aspects like the intervention, the mechanisms involved and the duration of the effect itself. Considering this, then pre-emptive analgesia (or the single pre-administration of one analgesic that will work for all scenarios) may not be enough. Although “in paper” the pre-emptive analgesia seems to be a great option, for some researchers it is “too good to be true” or even utopic. Clinical results from randomized clinical trials are debatable and sometimes even questionable, since many studies found no difference between pre and postoperative pharmacological approach. But preventive analgesia concept is not perfect either, since its main disadvantage is the wide kind of models included under the same idea. Several authors propose that each new publication or research protocol addressed to evaluate preventive analgesia, must be classified and analyzed by separate and with caution, to identify real benefits, or possible lacks of evidence and methodological bias.

PREVENTIVE DENTAL ANALGESIA: EVIDENCE BASED-APPROACH

For dentistry different data is available, some of them neutral and some favoring preventive

analgesia. Most of the possible clinical dental scenarios can be classified in two wide groups as shown in figure 1.

For cases where no previous inflammation is present (like implant or third molar surgery; or different elective surgical procedures) the main effects expected are a comfortable postoperative period, a decrease of the possibility to experience chronic central sensitization and lower consumption of analgesics following the intervention (which means less side-effects related to medication intake). Also as mentioned before, especially for those cases where the surgery takes longer or extends to a greater area than expected initially the preventive analgesia is advisable and may limit the undesirable sequels from the intervention (such as immediate postoperative pain after the anesthetic effect) (7).

For cases of preoperative pain (especially in endodontic pathologies or after trauma), preventive analgesia may be helpful to control transoperative pain and to increase the success and duration of anesthetic blockade (8). The other advantages such as less postoperative pain and analgesic requirements are also expected.

Proposed effects of preventive analgesia in dentistry

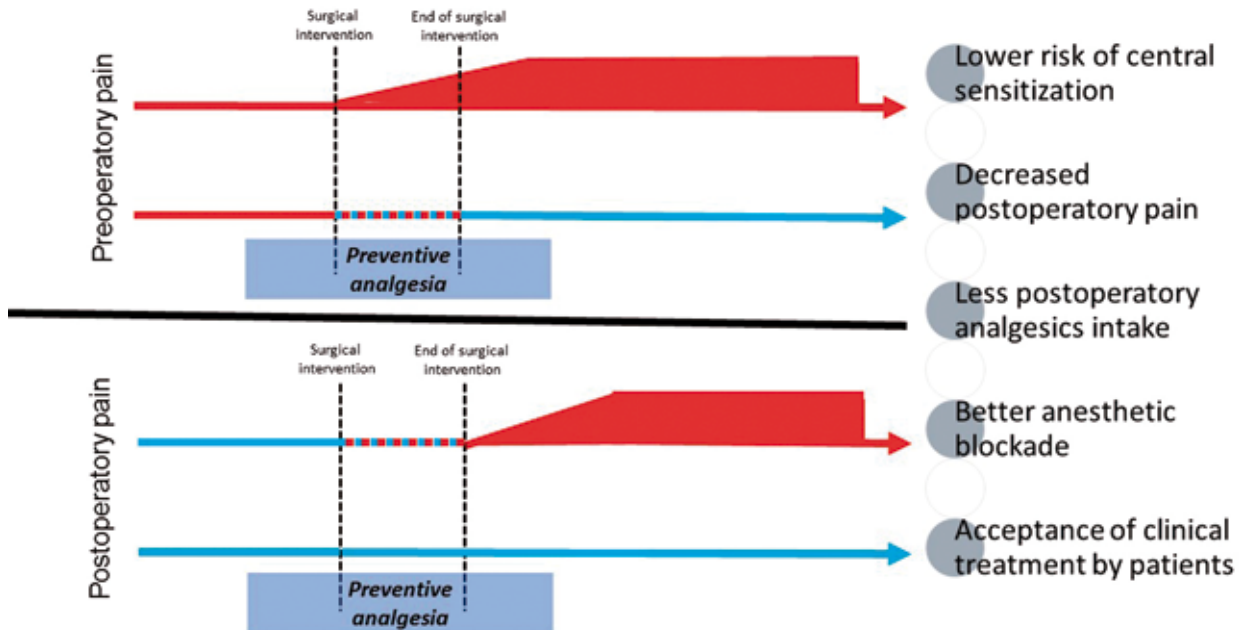


Figure 1. Two clinical scenarios are shown (preoperative and postoperative pain) for dentistry. Arrows represent temporal pain progress, where red color refers to increased pain and light blue to analgesia. In preoperative pain (top segment) preventive analgesia is expected to decrease intraoperative and postoperative discomfort. In the case where preoperative pain is not present, but postoperative pain is expected (bottom segment) preventive analgesia improves both intraoperative and postoperative period. On the left, main beneficial effects from preventive analgesia are listed.

PREVENTIVE ANALGESIA: WHAT TO USE?

All kind of preventive analgesics have been tested in dental research, from parenteral to local administration; from opioids to anti-inflammatory molecules. Between all the options available the non steroidal anti-inflammatory drugs (NSAIDs) are the first choice to be use (9). If these drugs are not indicated (due to allergic or systemic conditions) paracetamol or dual analgesics (Tramadol) can be employed. However, the lack of anti-inflammatory effect of these two makes them less effective to achieve preventive analgesia. Specially for Tramadol, direct local application in the perioperative period seems to be promising, and new studies must be done to confirm such effect (9). Many authors suggest that to assure preventive analgesia, it is better not to trust on a single molecule but to use analgesic combinations under the concept of multimodal analgesia (2,3,10). Multimodal

strategies also consider the use of coadjuvant drugs with analgesic potential (such as several anticonvulsives and antidepressives) in order to decrease the occurrence of possible neuropathic chronic pain, when it is expected.

In conclusion, the preventive analgesia is a reasonable approach to control postoperative pain. The main factors related to achieve preventive analgesia are the potency of the analgesic drugs, the coadjuvants of the analgesic therapy (multimodal analgesia), the posology of the drug regimen, the conditions of the clinical treatment, and the complete follow-up period (that means, the preoperative stage, the transoperative stage and the postoperative conclusion). If these factors are fulfilled, then effective preventive analgesia can be expected. However, from available studies we also learned that specially in dentistry, high quality evidence is still needed to confirm this clinical effect.

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