

Tramadol in Oral Surgery – A Literature Review

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Abstract

Elimination of pain is one of the most important duties of a doctor. A surgeon has to come across more number of cases where management of pain becomes a handful. Thus proper use of analgesics both systemic and local are an integral part of any successful surgery. For decades NSAIDs has been the go to drug for management of pain and administering analgesia. But recent pharmacological advancements have opened up a new way of administering analgesia in the form of synthetic opioids. This review article aims at finding out the efficacy of local administration of TRAMADOL in maxillofacial surgeries.

Keywords: Tramadol, Opioids In Oral Surgery

Introduction

Tramadol is a centrally acting synthetic opioid analgesic that was first manufactured in 1962. It has two synergistic mechanism i.e., it acts both as a weak opioid analgesic that is effective clinically in treating moderate to moderately severe pain and it also serves as an inhibitor of monoamine reuptake. Commercially, tramadol comes as a racemic mixture of two enantiomers (+) tramadol and enantiomers (-) tramadol that has superior analgesic properties than enantiomer alone ⁽¹⁾.

Non opioid analgesic mechanism of action of tramadol had been identified via inhibition of the reuptake of norepinephrine (NE) and serotonin [5-hydroxytryptamine (5-HT)] that are released from peripheral nerve endings by this mechanism, tramadol is inhibiting pain transmission in the central nervous system, and in this way contributing to its analgesic effect ⁽²⁾. Moreover, it has been discovered that they are also targets for analgesics and anesthetics. Apart

from these two described mechanisms of action, yet we do not know additional mechanisms of tramadol action ⁽³⁾. Unfortunately, there is an increase in the unjustified use of opioid analgesic drugs in dentistry, especially in oral surgery, prescribed for pain management after tooth extraction or third molar surgery. However, there is, no scientific evidence available to support this recommendation ⁽⁴⁾. In fact, there are evidences that shows that NSAIDs alone or in combination with acetaminophen are more effective than opioids or their combination administered systemically in treating dental pain ^(5,6,7). Also, tramadol has risk of adverse effects such as nausea, vomiting and dizziness.

Opioid analgesics are much less effective in pain management after tooth extraction or third molar surgery compared to NSAIDs. The recommendation to dental professionals is to prescribe NSAIDs for dental pain relief, and in a case of severe pain, to prescribe a combination of NSAIDs and paracetamol. However, tramadol can be considered as a first-line drug option for patients who are intolerant to NSAIDs or those with some contraindications, such as allergy, renal failure and high-risk of gastrointestinal haemorrhage.

Mechanism of action: possible local mechanisms of action of tramadol:

1. weak peripheral agonism over peripheral μ -OR ⁽⁸⁾, the number of which is enhanced in hyperalgesic and

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inflammatory conditions^(9,10).

2. favouring the opening of nonspecific voltage-dependent potassium (K⁺) channels⁽¹¹⁾.

3. acting in the nitric oxide pathway⁽¹²⁾.

4. agonistic action on vanilloid receptor 1 (TRPV-1 transient receptor potential vanilloid-1) that apart from local analgesic effect, can exert undesired local side effects, such as burning pain and erythema⁽¹³⁾.

5. with high concentration of tramadol blockade of the Nmethyl-D-aspartate (NMDA) receptors⁽¹⁴⁾ · local anesthetic effect of tramadol can be explained by direct blocking of voltage-dependent sodium (Na⁺) channels⁽¹⁵⁾

Tramadol in oral surgery:

Pang et al Demonstrated a local analgesic effect of tramadol following intradermal injection

Tsai et al Tramadol produced a neural conduction block that could not be reversed by naloxone. suggesting that an underlying mechanism of action of tramadol must differ from its opioid action

Mert et al Nerve conduction blockade with tramadol was similar to that of lidocaine, although it was weaker.

Altunkaya et al concluded that 5 % tramadol has a local anesthetic effect similar to 2 % prilocaine when used intradermally for excision of cutaneous lesions.

Pozos et al demonstrated that tramadol injected submucosally next to the extraction socket prolongs the anesthetic effect of articaine and that such administration could improve the management of postoperative pain

Isiordia-Espinoza et al concluded that preemptive ketorolac plus submucosal local tramadol resulted in better postoperative treatment of acute pain and in reduction in the consumption of postoperative analgesics

Ceccheti et al. concluded that submucosal administration of tramadol contributed to providing a pain free period of 3.5-4 hours after extraction, with rare adverse effects and good patient acceptance.

Gönül et al concluded that postsurgical pain VAS scores were significantly lower in first 12 hours, first

analgesic intake was significantly later, and total analgesic intake was significantly lower, in the tramadol group compared to the control groups

Al-Haideri et al concluded that tramadol with adrenaline injected supraperiosteally proved to be an effective local anesthetic for the extraction of upper molar teeth. Due to weak local anesthesia of plain tramadol (without adrenaline), the author stated that the presence of adrenaline, which produces vasoconstriction, thus deterring tramadol locally, is crucial for producing its anesthetic effects on the nerve

Conclusion

The aim of modern oral surgery is to adequately and efficiently control a patient's pain post operatively to ensure high quality local anesthesia. Various studies have shown that NSAIDs has several advantages over opioid analgesics, and concluded that opioids should not be prescribed as the first line drug of choice for treatment of acute dental pain. However , local administration of tramadol opens new possibilities in management of postsurgical pain. In this regard, tramadol applied locally submucosally, supraperiosteally, topically by means of small drops or as an adjuvant to local anesthetic, could provide promising results. Howeverthere is a need for large clinical studies to investigate safe and effective protocols for local administration of tramadol in day to day practices.

Ethical Clearance – Not required since it is a review article

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Conflict of Interest – nil

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