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Postoperative Hiccups Following Intraoral Dexamethasone in Third Molar Surgery: A Rare Adverse Drug Reaction

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KEYWORDS

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ABSTRACT:

Background: Dexamethasone is frequently used in oral and maxillofacial surgery to reduce postoperative pain, edema, and trismus following third molar extraction. Its potent anti-inflammatory action, long duration of effect, and favourable safety profile make it a common adjunct in perioperative management. Although generally well tolerated, corticosteroids may occasionally produce uncommon adverse effects. Hiccups have been reported following systemic corticosteroid therapy, but reports associated with intraoral administration in dental procedures remain limited.

Case Presentation: A 26-year-old healthy patient presented with pain and food impaction related to a partially impacted mandibular third molar. Surgical removal was performed under local anesthesia without intraoperative complications. As part of routine postoperative management, a single dose of dexamethasone was administered via intraoral submucosal injection near the surgical site. Within a few hours after surgery, the patient developed repetitive hiccups without associated systemic symptoms. Clinical evaluation revealed no surgical complications or identifiable medical causes. The patient was reassured and managed conservatively. The hiccups gradually subsided and resolved spontaneously within the postoperative period, with satisfactory healing noted on follow-up.

Conclusion: Hiccups may occur as a rare, transient adverse effect following intraoral dexamethasone administration after third molar surgery. Awareness of this possibility can help clinicians provide appropriate reassurance and avoid unnecessary investigations during postoperative care.

1. Introduction

Surgical removal of impacted third molars is one of the most frequently performed procedures in oral and maxillofacial practice. Postoperative pain, facial edema, and trismus are common sequelae that may affect patient comfort and delay functional recovery. To minimize these inflammatory responses, corticosteroids particularly dexamethasone are routinely used as adjuncts in the perioperative period (1–4). Dexamethasone is favoured due to its high anti-inflammatory potency, prolonged duration of action, and minimal mineralocorticoid effects. Various routes of administration, including oral, intravenous, intramuscular, and intraoral submucosal injection, have been described with comparable efficacy in reducing postoperative morbidity (2,3,5–7). Several clinical studies and meta-analyses have demonstrated that perioperative dexamethasone significantly reduces postoperative swelling, pain, and trismus following third molar surgery (1,4,8–10).

Despite its widespread use and favourable safety profile, dexamethasone is not devoid of adverse effects. Commonly reported complications include transient hyperglycaemia, gastric irritation, mood changes, and immunosuppression with prolonged use (10,11). Rarely, corticosteroid administration has been associated with

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the development of hiccups, a phenomenon more frequently documented in medical literature than in dental or maxillofacial surgery reports (12–14). Hiccups, although generally benign, may cause considerable discomfort, anxiety, and sleep disturbance, particularly in the immediate postoperative period. The occurrence of hiccups following dexamethasone administration is believed to be related to central nervous system stimulation of the hiccup reflex arc (14–16). Most reported cases involve systemic or intravenous routes of administration, with limited documentation of hiccups following intraoral delivery of dexamethasone. Given the increasing preference for intraoral submucosal injection due to its ease of administration and localized effect, awareness of this uncommon adverse reaction is clinically relevant. This report describes a case of transient hiccups developing after intraoral administration of dexamethasone following third molar surgery.

2. Case Presentation

A healthy adult 26years, patient presented to the Department of Oral and Maxillofacial Surgery, Sibar Institute of dental sciences, Guntur with a complaint of recurrent pain and food impaction in the posterior mandibular region. Clinical examination and radiographic evaluation revealed a partially impacted mandibular third molar. The patient's medical history was non-contributory, with no known systemic illness, gastrointestinal disorder, neurological condition, or history of chronic medication use. There was no previous history of hiccups or hypersensitivity reactions to medications. Surgical removal of the impacted third molar was planned under local anesthesia. Following standard aseptic protocol, the procedure was performed without intraoperative complications. A mucoperiosteal flap was reflected, bone removal and odontosection were carried out as required, and the tooth was extracted uneventfully. Hemostasias was achieved, and the surgical site was sutured. As part of the routine postoperative protocol to reduce inflammation and trismus, a single dose of dexamethasone was administered intraorally in the submucosal region adjacent to the surgical site. The patient was prescribed standard postoperative medications, including analgesics and antibiotics, and was discharged in stable condition with routine postoperative instructions. Within a few hours following the procedure, the patient reported the onset of repetitive hiccups. The episodes were intermittent but frequent, causing mild discomfort and anxiety. There were no associated symptoms such as nausea, vomiting, chest pain, dyspnoea, abdominal distension, or fever. The patient remained hemodynamically stable, and no signs of allergic reaction or local surgical complications were observed. A detailed assessment was performed to identify possible causes of the hiccups. Given the close temporal relationship between the intraoral dexamethasone administration and symptom onset, along with the absence of other identifiable etiological factors, a diagnosis of steroid-induced hiccups was considered. The patient was reassured regarding the benign and self-limiting nature of the condition and was advised conservative measures, including maintaining an upright posture and avoiding carbonated beverages. No additional pharmacological intervention was deemed necessary. The hiccups gradually decreased in frequency and resolved spontaneously within the postoperative period. At subsequent follow-up, the patient reported complete resolution of symptoms with satisfactory surgical healing and no further complications.

2. Discussion

Dexamethasone is widely used in oral and maxillofacial surgery as an adjunctive agent for the control of postoperative pain, edema, and trismus following third molar surgery. Its efficacy in reducing inflammatory sequelae has been well established, and both systemic and local routes of administration have been advocated (1–4,8,9). Submucosal injection, in particular, has gained popularity due to its ease of administration and comparable effectiveness in reducing postoperative morbidity (2,5,6). Despite its favourable safety profile, dexamethasone is associated with a range of adverse effects, some of which are uncommon and underreported in dental literature. One such rare but clinically relevant complication is the occurrence of hiccups following perioperative steroid administration (12–14). Hiccups (singultus) are defined as involuntary, spasmodic contractions of the diaphragm and intercostal muscles, followed by abrupt closure of the glottis. Although hiccups are typically benign and self-limiting, persistent episodes can cause significant patient discomfort, anxiety, sleep disturbance, and dissatisfaction with surgical care (13,14).

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In the present case, hiccups developed shortly after intraoral administration of dexamethasone following third molar surgery. The temporal relationship between drug administration and symptom onset, along with the absence of systemic illness or gastrointestinal pathology, strongly suggests a steroid-induced mechanism. While hiccups are more commonly reported following systemic corticosteroid therapy, particularly with dexamethasone, reports associated with intraoral or locally administered dexamethasone in dental procedures remain scarce.

The pathophysiology of steroid-induced hiccups is not completely understood; however, several mechanisms have been proposed. The hiccup reflex arc involves afferent pathways from the vagus nerve, phrenic nerve, and sympathetic fibers, with a central processing center located in the brainstem (15,16). Corticosteroids are believed to reduce the synaptic threshold within this reflex arc, thereby facilitating involuntary diaphragmatic contractions (16–18). Dexamethasone, due to its high potency and central nervous system penetration, may exert excitatory effects on the medullary centers involved in respiratory rhythm regulation (17,18). A review of the literature indicates that dexamethasone-induced hiccups are more frequently reported in oncology and anaesthesiology settings, particularly following intravenous administration (14,17). However, dental practitioners may underrecognize this complication due to its transient nature and spontaneous resolution. As demonstrated in this case, even a single perioperative dose can be sufficient to trigger hiccups in susceptible individuals.

Management of steroid-induced hiccups is largely conservative. Most cases resolve spontaneously within hours to a few days without pharmacological intervention (13,14). Simple measures such as reassurance, upright positioning, breath-holding maneuvers, and avoidance of gastric distension are often sufficient. In persistent or distressing cases, pharmacologic agents such as metoclopramide, chlorpromazine, or baclofen may be considered (14,15). From a clinical perspective, awareness of this potential complication is essential. Preoperative counselling regarding rare but benign adverse effects may reduce patient anxiety and improve satisfaction. Documentation of hiccups as a recognized postoperative event also helps avoid unnecessary diagnostic procedures and reassures both patient and clinician.

3. Conclusion

Although dexamethasone remains a valuable adjunct in third molar surgery, clinicians should be aware of rare adverse effects such as hiccups. Early recognition, reassurance, and appropriate documentation are key to optimal postoperative management. Reporting such cases contributes to improved pharmacovigilance and enhances understanding of uncommon drug reactions in dental practice.

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