WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Post-Operative Pain Management in Oral and Maxillofacial Surgery-A Review

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ABSTRACT

Pain is caused by stimulation of peripheral nerve fibres by noxious stimuli such as mechanical, thermal or chemical stimulants. Most patients express post-surgical pain once the effects of anaesthesia have disappeared. Post-surgical pain typically peaks after 24-36 hours after surgery. Post-operative pain in oral and maxillofacial surgery is an area of concern for both patients as well as the dental surgeons. Management of pain and anxiety is an important component of any dental practice. Post-operative pain management is very crucial in the patients' experience for any kind of treatment. In this review we throw light on post-operative pain in oral and maxillofacial surgery, its possible causes and management.

Keywords: Acute pain; analgesia; oral surgery; Postoperative pain; postsurgical pain.

INTRODUCTION

International Association for the Study of Pain (IASP) defines pain as 'An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'[1]. Pain caused by stimulation of peripheral nerve fibres by noxious stimuli such as mechanical, thermal or chemical stimulants. Post-operative pain is a type of acute pain, which has the potential to become chronic[2]. Pain impairs physical function, quality of life and affects sleep. Most patients describe post-surgical pain once the effects of anaesthesia have gone. Post-surgical pain typically peaks 24–36 h postoperatively. Pain can prevent further damage to a person when they are already injured; this is observed in post-operative pain when people tend avoid activities can increase their pain. In the event of surgical removal of third molars, this may include avoiding of hard or sharp foods due to the fact that they will cause increased pain and damage to the healing site[3]. Post-operative pain is mostly seen in persons with, major risk factors including smoking, use of oral contraceptives and obviously surgical trauma, all of these have high chances to lead to dry socket[3]. The signs of post-operative pain include the patient feeling distressed, fear of being touched or moving, emotional fragility. dry socket causing the pain, malodorous signs with evidence of an empty extraction socket, Evident areas of tissue necrosis, inflammation, or ulceration. Symptoms include Anxiety, Insomnia, Complaints associated with adjacent dentition or ipsilateral opposing arch, Otalgia, pain frequently related to dry socket5. Anxiety about a procedure or the pain anticipated after the procedure can increase the post-operative pain[4]. Achieving absolute zero pain in the post-operative phase is almost impossible, however as dentists there is an ethical compulsion to reduce pain. Poorly managed acute postoperative pain may be associated with chronic postoperative pain necessitating regular dentist visit and the need for an alternative treatment[5].

RISK FACTORS AND INVESTIGATION

The risk factors may be procedure related which are Difficulty of surgery, Duration of surgery Surgeon's level of experience; patient related which include Preoperative pain, Poor mouth hygiene, Smoking, Anxiety, Depression and Negative social factors. The other factors include Anatomical factors (depth of root, lingual inclination of the tooth), Site (region of the inferior alveolar nerve, after removal of the mandibular third molar, implant placement or anaesthesia) Surgical technique (duration of surgery, removal of distal bone and raising of a lingual flap, vertical division of a tooth, use of rotary instruments rather than bone chisels)[6]. Investigation includes obtaining complete medical and dental history. When a likely clear cause is not seen, imaging should be considered: periapical and/or panoramic X-rays are great choices, Patients with symptoms and signs of systemic illness may require complete medical assessment. Complete extraoral and intraoral examinations should be done to look out for possible sources of pain. Frequent causes include: Normal sequelae of surgery, mucosal ulcerations following minor surgical procedures, possible dry socket due to poor wound healing, Wound infection and any Secondary source or incorrect preoperative diagnosis. Pain that develops 3–4 days after an extraction should be critically checked for presence of dry socket or infection[8].

DIAGNOSIS AND ACTIONS TO BE TAKEN

Based on complete examination including radiographic examination, a diagnosis of post-operative pain is determined. When a proper diagnosis cannot be formulated, consultation from practitioners should be sought. Differential Diagnosis includes Normal sequelae, Infection, Temporomandibular disorder, Dry socket, atypical neuralgia, pain-focused behaviour, Iatrogenic nerve injury and Jaw fracture[6]. Main action of a surgeon anticipating post-operative pain is to identify factors predicting pain intensity in order to decide the type of initial treatment, duration of treatment. Anticipate onset of pain by early prescription of analgesics, taking account of speed of onset of action and not to prolong nerve block unless it is really necessary[7].

MANAGEMENT

The anticipation of post-surgical pain should therefore result in the implementation of a protocol that incorporates a customized approach based on the needs of the individual patient. Common Initial Management includes Combined use of acetaminophen and NSAIDs to capitalize on their synergistic properties, where not contraindicated, Analgesics (opioids and non-opioids) and Cold compresses. Alternate Treatments include Use of intra-socket medication in the case of dry socket, Use of topical agents to address mucosal irritation from surgical procedures, Refraining from smoking during the postoperative period[5]. The management by analgesics has been summarized in table 1

TABLE 1: MANAGEMENT OF POST-OPERATIVE PAIN BY ANALGESICS

ANALGESIC	DESCRIPTION	RECOMMENDED DOSE	SIDE EFFECTS
PARACETAMOL	INDICATIONS It's typically used to relieve mild or moderate pain, such as headaches, toothache or sprains, and reduce fevers caused by illnesses such as colds and flu. CONTRAINDICATIONS i. caloric undernutrition. ii. acute liver failure. iii. liver problems. iv. a condition where the body is unable to maintain adequate blood flow called shock. v. acetaminophen overdose. vi. acute inflammation of the liver due to hepatitis C virus. ANTIDOTE **Intravenous acetylcysteine** is the antidote to treat paracetamol overdose and is virtually 100% effective in preventing liver damage when given within 8 hours of the overdose.	4 g/day	Overdose can lead to acute liver injury
ACECLOFENAC	INDICATIONS indicated for the relief of pain and inflammation in osteoarthritis, rheumatoid arthritis and ankylosing spondylitis. CONTRAINDICATIONS Active, or history of recurrent peptic ulcer/haemorrhage Hepatic failure and renal failure Patients with established congestive heart failure ischaemic heart disease, peripheral arterial disease and/or cerebrovascular disease. Active bleedings or bleeding disorders.	200mg/day	headache, nausea, vomiting, epigastric pain, gastrointestinal irritation, gastrointestinal bleeding, rarely diarrhoea, disorientation, excitation, coma, drowsiness, dizziness, tinnitus, hypotension, respiratory depression, fainting, occasionally convulsions. In cases of significant poisoning acute renal failure and liver damage are possible.

	Aceclofenac should not be prescribed during pregnancy, especially during the last trimester of pregnancy, unless there are compelling reasons for doing so. The lowest effective dosage should be used ANTIDOTE Within one hour of ingestion of a potentially toxic amount, activated charcoal should be considered. Alternatively, in adults, gastric lavage should be considered within one hour of ingestion of a potentially life-threatening overdose.		
DICLOFENAC	INDICATIONS mild to moderate muscle pain; - contusions; - post-traumatic pain CONTRAINDICATIONS The use in children and adolescents aged less than 14 years is contraindicated. - Third trimester of pregnancy. - Patients with renal impairment ANTIDOTE Anti-inflammatory drugs	50 mg orally 2 or 3 times a day	○ indigestion, gas, nausea, vomiting, stomach pain; ○ diarrhoea, constipation; ○ headache, dizziness, drowsiness; ○ abnormal lab tests; ○ itching, sweating; ○ stuffy nose; ○ increased blood pressure; or ○ swelling or pain in your arms or legs.
IBUFROFEN/IMOL	Ibuprofen + Paracetamol + Caffeine is a combination of two pain relievers (Ibuprofen , Paracetamol) and a stimulant (Caffeine). INDICATIONS Ibuprofen is indicated for the relief of mild to moderate pain including rheumatic and muscular pain, backache, neuralgia, migraine, headache, dental pain, dysmenorrhoea, feverishness and for the relief of the symptoms of cold and influenza. CONTRAINDICATIONS Bronchial asthma hepatic failure, renal failure or severe heart failure ANTIDOTE Consider oral administration of activated charcoal if the patient presents within 1 hour of ingestion of a potentially toxic amount. If frequent or prolonged, convulsions should be treated with intravenous diazepam or	400mg TDS	1) Nausea 2) Indigestion 3) Stomach pain 4) Restlessness 5) Increased heart rate 6) Heartburn

	lorazepam. Give bronchodilators for asthma.		
PIROXICAM	INDICATIONS used to reduce pain, swelling, and joint stiffness from arthritis. CONTRAINDICATIONS heart bypass surgery ANTIDOTE No Specific Antidote	20 mg orally once a day	• Abnormal liver function tests; • urination problems; • upset stomach, heartburn, loss of appetite, stomach pain, nausea, vomiting; • gas, diarrhoea, constipation; • dizziness, headache; • itching, rash; or • ringing in your ears.
KETOROLAC	INDICATIONS Short-term treatment of moderate to severe pain in adults. It is usually used before or after medical procedures or after surgery. CONTRAINDICATIONS patients with active peptic ulcer disease, in patients with recent gastrointestinal bleeding or perforation and in patients with a history of peptic ulcer disease or gastrointestinal bleeding. ANTIDOTE There are no specific antidotes	20 mg PO once followed by 10 mg q4 to 6 hours prn not > 40 mg/day	nausea, vomiting, constipation, diarrhoea, dizziness
OPIOIDS [All opioids used in postoperative pain management summarized in table 2]	Opioids play a central role in nociception. Endogenous opioids modulate the experience of pain, and opiate therapeutics are useful in the management of acute and chronic pain. Mild opioids such as codeine, dihydrocodeine and tramadol are unlikely to cause dependence in short term use for post-operative pain.	30mg every four to six hours 60 mg codeine + 1 g paracetamol / 6 h Tramadol: 50-100 mg / 4-6 hr + Paracetamol: 1g / 6 h	• Respiratory depression. • Depression of the cough reflex. • Nausea and vomiting. • Constipation. • Hypotension and bradycardia. • Tolerance – this is due to receptor desensitisation. • Dependence (physical or psychological) o Euphoria

Codeine	15–60 mg orally q4-6h
Hydrocodone	5–10 mg orally q3h
Oxycodone	5–7.5 mg orally q6h
Meperidine	50–150 mg orally q3–4h
Pentazocine	50 mg orally q3–4h
Tramadol	50-100 mg q4–6h, max 400 mg /day

TABLE 2: OPIOID ANALGESICS USED IN POST-OPERATIVE PAIN

Salicylic acid derivative—Acetyl salicylic acid	325-650 mg orally q4h / 1000 mg orally q6h.
Propionic acid derivative—Ibuprofen	400–600 mg orally q4–6h
Propionic acid derivative—Naproxen	550 mg orally initially, then 275 mg orally q6–8h
Acetic acid derivative—Keterolac	30 mg IV or 60 mg IM q6h / 20 mg orally initially, then 10 mg orally q4–6h
Acetic acid derivative—Diclofenac	50–75 mg orally/IV q12h

Oxicams—Piroxicam	10-20 mg orally q 12 h
N- phenyl—anthranilates—Mefenamic acid	500 mg load, then 250 mg q6h orally
Celecoxib	200 mg orally q24h / 100 mg orally q12h

CONCLUSION

Postoperative pain not only has an impact in patient's surgical output and satisfaction, but also affects patient's physiology, poor wound healing, and sleep. Adequate prevention and management of post-operative pain is an important aspect in dental practice. Management of post-operative pain will ensure that the patient journey through surgical procedures is efficient and satisfying. Pain management protocols for post-operative pain management in oral and maxillofacial surgery have been briefed in this review based on the latest protocols and proofs.

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