



WORLD JOURNAL
OF ADVANCED
SCIENTIFIC RESEARCH

PAIN CONTROL IN DENTISTRY

Dr Rohit Shah*, Dr Meenakshi Talati**, Dr Dipika Mitra***, Dr Silvia Rodrigues*, Dr Gaurav Shetty****, Dr Saurabh Prithyani****, Dr Harshad Vijayakar*****

*- Reader, **-Postgraduate student, ***- Professor, ****- Lecturer, *****- Professor and Head

Department of Periodontology

TPCT's Terna dental college and hospital

Sector-22, Nerul, Navi Mumbai-400706

Introduction

Effective pain management is an essential and one of the challenging parts of dental practice. Pain presenting to patient are peculiar to them, however we dentists are trained to being therapists rather than diagnostician's. Dental practitioners are conditioned to treat and our patients are conditioned to accept the treatment [1]. Dental practitioners are more mouth oriented than patient oriented. However, when we meet obscure pain complaints we need to call forth all our best diagnostics capabilities. Field of orofacial pain includes pain conditions that are associated with the hard and soft tissue of head, neck and all intraoral structures. The diagnostic range includes headache, musculo-skeletal pain,

neurogenic psychogenesis pain, pain from major diseases like AIDS, TB, cancer etc the evaluation and treatment of orofacial pain has evolved into a shared responsibility between the dentist and the physician with considerable overlap that is distinguished only by the individuals knowledge and training [2].

Etiopathogenic classification of pain

- A) Pain due to local causes
 - a. Pathologic changes in teeth and jaws
 - b. TMJ and associated muscles of mastication
 - c. Nose and Para nasal diseases
 - d. Oral mucosal diseases

- e. Lymph node diseases
 - f. Salivary gland disease
 - g. Diseases of blood vessels
- B) Pain along nerve trunk and central pathways
- a) Trigeminal neuralgia and glossopharyngeal neuralgia
 - b) Migraine and other types of head aches
 - c) A typical facial palsy
- C) Referred pain from other organs
- a) Cervical spondylitis
 - b) Angina pectoris
 - c) Oropharyngeal diseases
 - d) Diseases of ENT [3]

Principles of Pain Management:

- 1) Pain therapy is begun with non-narcotic analogies (NSAID's) for mild to moderate pain. If these drugs are ineffective intermediate potency opioids such as codeine or its derivatives are combined with them. NSAIDs are effective in many symptoms of bone associated pain. They also decrease stiffness, swelling and tenderness. Opioids and NSAIDs induce rapid change in pain sensation.
- 2) Treatment of acute pain requires location, origin and cause of pain. Management implies targeting short-term symptomatic relief; because the goal is to modify pain impulses during the period of tissue healing. NSAIDs can limit pain, swelling and erythema. Other agents that may be given are muscle relaxants.
- 3) For severe or chronic pain analgesics are given at regular interval in adequate doses. Medication should never be prescribed on SOS basis as pain will

not resolve abruptly, oral medication is preferred, especially long acting, unless patients factor prohibit such.

Pain Control

One of the most important aspects of practice of dentistry is control or elimination of pain. In the past, pain was assumed to be closely associated with dentistry that the word pain and dentistry have become synonymus. Few methods of pain control are listed below -

Methods of pain control

1]Removing the cause

By removing the etiologic factors, environmental changes would be eliminated, consequently free nerve ending would not be excited and no impulses would be initiated. It is imperative that any removal leaves no permanent environmental changes in tissue, since this condition would be able to create the impulses even though the causative factor had been removed. This method clearly affects pain perceptions [4].

2]Blocking the pathways of painful impulses:

It is one of the most widely used methods during minor oral surgeries in dentistry. In this method a suitable, potent local anaesthetic is injected in to the tissues in proximity to the nerves involved. The local anaesthetic solution prevents depolarization of nerve fibres at the area of absorption thus preventing fibres from conducting any impulses centrally beyond that point. As long as solution is present in the nerve in sufficient concentration to prevent depolarization, the block will be in effect.

3]Pharmacotherapy of pain:

This is the corner stone of the treatment of pain. Analgesics are the most frequently used in the

treatment of pain. Several other classes of pharmaceutical agents are used for palliative and cause related therapy. Some drugs bind to the known receptor, which are cellular components with which natural body chemicals (ligands) interact to produce physiologic responses. Some drugs (agonists) mimic rather the action of natural substance. Other drugs prevent these actions, have an antagonist's effect or act as a blocking agent.

Many things to be known about medications are: indications, contraindications, incompatibility, mode of action mode of administration, safety, toxicity, complications, idiosyncrasy, anaphylaxis and other unwanted reactions [5].

Analgesic Agents:

As a general rule the objective of analgesics should not be to eliminate pain altogether. Pain has some value in monitoring progress in patient's condition. The main objective of analgesic is to make the pain tolerable to the patient [6].

Types

- Non-narcotic analgesics
- Narcotic analgesics
- Adjuvant analgesics

Non-narcotic analgesics

These include aspirin and NSAIDS, which have analgesic, anti-pyretic, anti-platelet, anti-inflammatory actions. They differ from narcotic analgesic in that they presumably prevent the formation of prostaglandin E1 by inhibitory action on enzyme, cyclo oxygenase. NSAID's don't produce tolerance, physical dependence or addiction and they have a ceiling effect where by the increase in the dosage beyond a threshold dose does not increase the analgesic effect, but may affect the duration of the analgesic. Acetaminophen and

chloride magnesium tri-salicylate are included in the non-narcotic group, also they lack anti-platelet and inflammatory action. They are used in the treatment of mild to moderate pain and chronic pain. Aspirin and NSAIDS are contraindicated in patients with anticoagulant therapy and other coagulation deficiency condition [7].

Narcotic analgesic

Includes morphine and morphine like drugs. They act by: -

1. Depressing nociceptive neurons while stimulating non-nociceptive cells.
2. Elevates the threshold for painful stimuli
3. Alters the emotional reaction to pain
4. Produces sleep which also elevates the threshold

Morphine inhibits release of bradykinin when mediated by neural mechanism. Addition of codeine to NSAIDS increases its analgesic effect. Narcotics are useful in managing severe acute pain and chronic cancer pain but contraindicated in chronic orofacial pain. It also causes constipation; therefore, stool softener and laxatives should be administered, at regular time schedules.

Clinicians need to be careful for

1. Tolerance = larger dose is required to obtain a satisfactory analgesic effect.
2. Physical dependence= withdrawal symptoms will manifest on stopping the drug
3. Addiction=compulsive usage of the drug and the need to use it for effects other than pain relief

These enhance the analgesic effect of other medications [8]. Adjuvant analgesic have independent analgesic activity in certain situations. These include tricyclic antidepressants,

antihistamine, caffeine, steroids, phenothiazines and anticonvulsants.

Anaesthetic Agents:

These agents can be used for diagnosis as well as pain management. It can be used topically and in injection form.

Topical

These are available as solution, spray, and ointments. Water-soluble ointment containing topical anaesthetic and germicide are used for managing dental alveolitis. Analgesic balms are agents that give soothing palliative relief to the inflammatory pain of superficial deep categories when applied locally to exposed tissue. Aloe Vera juice is an ancient remedy for superficial pain; balsam of pura; eugenol and guaiacol are other well-known balms. These are useful in controlling pain from exposed/ulcerated and mucogingival tissue, exposed dentin and acute alveolitis [9,10].

Injectable local anaesthetics (LA)

A variety of LA is available in different concentration with or without vasoconstrictors. Long acting LA such as bupivacaine are useful, even though they have a higher risk of toxicity. Proper dosage, technique, adequate precaution and readiness of emergency is essential for safety and effectiveness of all forms of LA. Extreme caution is required when vasopressor agents are used in patients receiving Monoamine oxidase (MAO) inhibitor or anti-depressant of triptyline type because severe prolonged hypertension may result. Injection of 0.02% morphine sulphate around peripheral nerve has been repeated to yield LA that is equal to bupivacaine in onset and duration. Small dose of one mg. or less of morphine does not produce any systemic effect [11].

Anti-inflammatory agents:

In addition to anti-inflammatory analgesics there are several nonsteroidal medications that are mainly used for their anti-inflammatory effect but they are mild analgesic and antipyretic. They act by inhibition of prostaglandin's biosynthesis. They do not alter disease but suppress symptoms of inflammation. Corticosteroids exert potent anti-inflammatory effect by inhibiting prostaglandin biosynthesis; their suppressive effect on inflammation may mask infection. These are contraindicated in systemic fungal infection and Herpes simplex infection [1].

Muscle relaxants:

These are used to control myogenous pain. The muscle relaxants are anti-cholinergic. The examples being succinyl choline and methocarbamol. [12].

Antidepressants:

Tricyclic anti-depressant agents increase the availability of serotonin and non-epinephrine in the CSF. The dimethylated tricyclic drugs make serotonin proportionally more available and induce some sedative effect. The mono methylated tricyclics makes nor-epinephrine proportionally more available and induces some CNS stimulation. Many sedatives and tranquilizing agents are available some of which have muscle relaxants action. Major tranquilizers like phenothiazines are useful in pain control and they act by decreasing modulating effect on anxiety and apprehension. Major tranquilizers such as meprobromate and diazepam have the advantage of possessing fewer side effects. Their muscle relaxation action is useful but drug tolerance, dependence and addiction are common side effects. If they are used, they should be prescribed for limited period only or different drugs should be used periodically [13].

Antihistamines:

They counteract vasodilating action of histamine by blocking histamine receptors and are useful in allergic responses especially in Neurovascular pain [14].

Anticonvulsive agents:

Phenytoin sodium is an anticonvulsant and is capable of suppressing pain in about 20% cases of paroxysmal neuralgia. Carbamazepine (Tegretol) gives pain relief in 70% cases of trigeminal and glossopharyngeal neuralgia [15].

Neurolytic agents:

Agents like 95% of ethyl alcohol is used to destroy the peripheral nerve. Sometimes phenol is added to it and provides long-term relief. The major disadvantage being local fibrosis and hence it is not used commonly. Injection of 0.3 ml of glycerol into retrogasserion space for the treatment of trigeminal neuralgia reported 90% reduction in pain. No dysesthesia or anaesthesia, dolorosa observed, glycerol acted on the demyelinated axons assumed to be involved in triggering neuralgia pain [16].

Diet:

L- tryptophan an amino acid is a main dietary component. In a case it was reported that pain relief was not possible even after 30 mg of intravenous morphine. However the pain was controlled by 4 grams of L-tryptophan per day for several weeks. The dietary supplements that can aid in reduction of pain are listed below, [17]

1. L-tryptophan 4 grams of per day
2. Low protein, low fat, high carbohydrate
3. Vitamin B-6 10-25 mg/day

4. Four weeks or more of continuous therapy is usually required.

Physical Therapy:

Modalities

This is done by using an instrument or device. These are generally sensory stimulants, ultrasound therapy, electrogalvenic stimulation (EGS) and deep heat and can effectively locally control pain. [18]

Sensory stimulation could involve -

Cutaneous stimulation:

Stimulation of skin is used for pain control from ancient times. The effect occurs through stimulation of thick myelinated cutaneous afferent, A-beta neurons chiefly. Different forms like Pressing/Rubbing skin directly over lesion and also by adding stimulating substances like alcohol menthol ointment are employed effectively. The use of mechanical vibrator reduces pain in one-third of patients. Hydrotherapy-directed spray of water over the lesion also reduces pain [19].

Conclusion:

Pain, although unpleasant, is actually a protective sensation and indicative of an underlying causative condition which needs to be managed. Pain management however is of utmost importance from the dentist and patients' point of view.

Every day our patients seek care for the reduction or elimination of their pain. Nothing remains more satisfying to the clinician than the successful elimination of pain. The most important part of managing pain is understanding the problem and the cause of pain. It can be achieved only through proper diagnosis and employing appropriate therapy. It is also necessary to better understand the practice

patterns for pain management and analgesic use amongst general dentists and dental specialists.

However there still remains scope for research in a number of areas related to the successful management of acute post-operative pain in dental settings. Gaps in the current pharmacologic knowledge include efficacy of prescribing analgesics at fixed intervals versus as needed (SOS), demographic, behavioural and genetic factors that potentially predict pain relief efficacy, adverse outcomes and abuse.

References:

1. Haas DA (2002) An update on analgesics for the management of acute postoperative dental pain. *J Can Dent Assoc* 68: 476-482.
2. Becker DE (2010) Pain management: Part 1: Managing acute and postoperative dental pain. *Anesth Prog* 57: 67-78.
3. Arroyo HA (2003) Headaches in children and adolescents. An etiopathogenic classification. *Rev Neurol* 37: 364-370.
4. Perlman SL (1988) Modern techniques of pain management. *West J Med* 148: 54-61.
5. Lynch ME, Watson CP (2006) The pharmacotherapy of chronic pain: a review. *Pain Res Manag* 11: 11-38.
6. Dionne RA, Berthold CW (2001) Therapeutic uses of non-steroidal anti-inflammatory drugs in dentistry. *Crit Rev Oral Biol Med* 12: 315-330.
7. Ahmad N, Grad HA, Haas DA, Aronson KJ, Jokovic A, et al. (1997) The efficacy of nonopioid analgesics for postoperative dental pain: a meta-analysis. *Anesth Prog* 44: 119-126.
8. Haas DA (2002) Opioid agonists and antagonists, Pain and anxiety control in dentistry. Philadelphia, USA 114-128.
9. Adriani J, Zepernick R, Arens J, Authement E (1964) The comparative potency and effectiveness of topical anesthetics in man. *Clin Pharmacol Ther* 5: 49-62.
10. Meechan JG (2000) Intra-oral topical anaesthetics: a review. *J Dent* 28: 3-14.
11. Malamed SF (1997) *Handbook of local anesthesia* (6th Edn) Elsevier, Canada.
12. Kirmeier R, Truschnegg A, Payer M, Acham S, Schulz K, et al. (2007) Evaluation of a muscle relaxant on sequelae of third molar surgery: a pilot study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 104: e8-14.
13. Gerschman JA, Reade PD, Burrows GD (1984) Evaluation of a proprietary analgesic/antihistamine in the management of pain associated with temporomandibular joint pain dysfunction syndrome. *Aust Dent J* 29: 300-304.
14. Vargas-Espinosa ML, Sanmartí-García G, Vázquez-Delgado E, Gay-Escoda C (2012) Antiepileptic drugs for the treatment of neuropathic pain: a systematic review. *Med Oral Patol Oral Cir Bucal* 17: e786-793.
15. Thapa D, Rastogi V, Ahuja V (2011) Cancer pain management-current status. *J Anaesthesiol Clin Pharmacol* 27: 162-168.
16. Richard DM, Dawes MA, Mathias CW, Acheson A, Hill-Kapturczak N, et al. (2009) L-Tryptophan: basic metabolic functions, behavioral research and therapeutic indications. *Int J Tryptophan Res* 2: 45-60.
17. Gloth MJ, Matesi AM (2001) Physical therapy and exercise in pain management. *Clin Geriatr Med* 17: 525-535, vii.

18. Kasat V, Gupta A, Ladda R, Kathariya M, Saluja H, et al. (2014) Transcutaneous electric nerve stimulation (TENS) in dentistry: A review. *J Clin Exp Dent* 6: e562-568.
19. Johnson MI, Paley CA, Howe TE, Sluka KA (2015) Transcutaneous electrical nerve stimulation for acute pain. *Cochrane Database Syst Rev* 6: CD006142.