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Review Article

An Insight into Dental Pain

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Abstract

Dental pain is most common type of pain with no age prediction. A good history taking and examination is the key for finding the origin of the pain. Primary physician should be able to assess dental condition and refer it to the dentist. Pain should be differentiated between odontogenic and non odontogenic origin for their better prognosis. The use of medications is a common prophylaxis is common in practice.

Keywords: Pain; Non – Odontogenic; Pulpitis; Pericoronitis; Periosteum; Paracetamol; NSAID; Opioid

Introduction

Dental pain can be occurred after a trauma or inflammation of dental tissues. It affects significant number patients in the world. The most common orofacial pain is dental pain.

Clinically dental pain can be of different types like, short and sharp, dull and aching, persistent pain and gnawing types of pain. Non odontogenic source also cause dental pain, and also be a referred pain from other parts of the body. Children are mostly experiencing dental pain since their parents have high risk of getting caries. History taking and examination is the important step for differentiating odontogenic and non odontogenic dental pains. Non steroidal anti inflammatory drugs such as ibuprofen, paracetamol are common drugs of choice for pain relief [1].

Physiology of pain

It seems that the pulp's sensory system is well adapted to alerting dentists to possible tooth injury. Numerous A (myelinated) and C (unmyelinated) nerve fibers innervate the tooth. These comprise sympathetic fibers that regulate pulpal blood flow in addition to sensory afferent fibers. Branching off from the sensory nerves in the peripheral pulp, the sub odontoblastic plexus is an interlacing network of fibers. Nerve fibers that originate from this plexus reach the dentin, predentin, and odontoblastic layer before ending as free nerve terminals. Pulpal stimulation in all its forms is regarded as noxious and solely produces pain [4].

This indicates that fluid displacement in dentinal tubules, which in turn activates A fibers, is responsible for the sensitivity of dentin. C fibers seem to react only to irritating stimuli that have a direct impact on the pulp. Although the exact function of odontoblasts in pain registering remains unknown, their death does not appear to impact dentin sensitivity [4]. Research suggests that certain inflammatory mediators and variations in intrapulpal pressure reduce the pulp's nerve terminals' pain threshold.

Types

When a tooth comes into contact with something cold or sweet, it may cause a brief, intense discomfort that could be reversible pulpitis. Discomfort that is dull, agonizing, and pulsating and that is brought on by thermal stimuli (heat or cold). There is no swelling and the discomfort might last for a long period, possibly developing into irreversible pulpitis. Acute abscess that could impede breathing and speaking by blocking the airway [8]. They may result from cellulitis in the soft tissues of the mouth cavity, or from Ludwig's angina. When it reaches the terminal stage, tooth loss may occur

from soreness that hurts to the touch. They may indicate either a chronic or acute apical abscess. Apical peridontitis can manifest as inflammation or infection in cases of denture pain. Antibiotics are useful for all of the pain categories listed above, but dental intervention is sufficient for more treatment and recovery [1].

Etiology

Odontogenic origin

The dental pulp is a connective tissue that contains nerves, blood vessels, and lymphatic vessels Most toothaches are caused by damage to dental pulp, which can be traumatic infections, or inflammatory. Inflammation and pain in the pulp can also result from damage from prior dental procedures. Dental caries may result in periapical abscesses and pulpitis. Pulpitis is pulp inflammation, and pericoronitis, which can result in localized infection, can appear when wisdom teeth emerge. A variety of infections of the gums, periodontal tissues, or the alveolar bone—which holds the teeth in place—are also included in periodontal disease [3]. Infection can also result from gingivitis, or gum inflammation. Ulcers may develop in acute gingivitis, which then develops into acute necrotizing ulcerative gingivitis (ANUG). Pain, fever, discomfort, and gum necrosis are signs of an ANUG.

Non odontogenic origin

Pulling pain in the muscular region that does not pulse is called myofacial pain [8]. Rather than a pathological oral damage, muscle overstrain and elevated emotional stress are more likely to be the cause of this pain. Cardiogenic allopathic pain, also known as jaw pain associated with referred pain in the left shoulder, arm, throat, ear, teeth, and jaw, is caused by cardiac ischemia. The trigeminal complex's convergence process can be used to explain the cause of cardiac problems in the orofacial region. Because the maxillary sinus is close to the roots of the upper posterior teeth, infection of the dental tissues may result in maxillary sinus inflammation. The phrase "neuropathic pain" refers to pain that results from a neurological issue [8]. The most common type of neuralgia is trigeminal neuralgia, which affects the mandibular nerve. Patients may seek dental care when they have orofacial pain, which may be a warning sign of oral cancer. Primary intraosseous cancer that does not affect the mouth mucosa and instead forms inside the jaws. Odontogenic cyst showing presence of facial pain and deviation of the jaw opening. Systemic cancers such as lymphoma may present with toothache, as they infiltrate pain sensitive structures like periosteum and gingiva that cause pain which may be confused with odontogenic pain. Stress is common reason for psychological tooth pain.

Examination

Extra oral examination

Upon conducting an inspection, it is crucial to thoroughly examine any areas of swelling on the mandibular and submandibular region, as they may be associated with lower tooth issues. Similarly, if there is any swelling present on the maxillary and infraorbital region, this could potentially indicate problems with upper teeth (and any complaints of difficulty in eye opening should raise concerns about potential spread of infection). Further assessment must also include measuring the mouth opening to detect signs of trismus. If the mouth opening measures less than two finger breadth, this could suggest that the infection has spread to the muscles involved in chewing. It is also important to check vital signs such as temperature, pulse, and blood pressure to monitor for systemic involvement. Finally, thorough palpation of lymph nodes is necessary to evaluate for possible spread of infection through the lymphatic system [3].

Intraoral examination

Careful examination and observation of any swelling in the oral cavity is crucial, as a raised tongue can be a telltale sign of infection that has potentially spread to the floor of the mouth. This can result in an obstruction of the airways, posing a serious risk to one's breathing. In addition to this, thoroughly inspecting the hard tissues, such as teeth, is imperative as glossly decayed or badly broken tooth can indicate underlying issues. Furthermore, the appearance of bubbles on the gums may suggest a chronic abscess, which often presents itself as a sinus tract. It is also important to note any inflammation of the surrounding gum tissues (known as pericoronitis) during this inspection process. Taking note of these symptoms and seeking prompt medical attention can prevent further complications and ensure proper treatment for optimal oral health [1].

Management

Pharmacological

NSAIDs are the most commonly used medications for pain management. Because plasma proteins bind them, the body absorbs them completely. Prostaglandins have a significant role in the development of pain and inflammation. As a result, NSAIDs' clinical efficacy in reducing tooth pain and inflammation is predicted. NSAIDs like ibuprofen are advised for pain brought on by endodontic, surgical, restorative, or periodontal procedures [10]. Gastrointestinal problems and insomnia are among the side effects of using ibuprofen. Primarily affecting the central nervous system is

acetaminophen, often known as paracetamol. Because of its analgesic and antipyretic qualities, paracetamol readily permeates the cerebral fluid. It affects the central nervous system by preventing the spinal cord from producing prostaglandin and by preventing macrophages from producing nitric oxide [3].

Opioids are a broad family of well-known, effective medicines with well-documented side effects and intolerance problems. Opioid drugs fall into three categories: naturally occurring (morphine, codeine), semi-synthetics (oxycodone), and pure synthetics (fentanly, methodone). Opioid analgesia is produced through activating opioid receptors present on neurons. Opioids are frequently used in conjunction with paracetamol or other medications to relieve dental pain. This medication's side effect profile includes nausea, vomiting, and respiratory depression. The concurrent administration of two additional analgesic drugs with distinct mechanisms of action is known as combination analgesic therapy. There are commercially available products with fixed dose combinations [7].

Antibiotics are frequently used to prevent localized infections. Despite the possibility of oral microorganisms spreading and infecting distant tissues during dental operations, there is no concrete proof of this happening. Antibiotics are frequently prescribed by dentists for either therapeutic or preventive purposes. Antibiotics used prophylactically are administered to stop diseases brought on by oral flora members migrating to far-off places or to a local host that is impaired [9].

Non pharmacological

Cold compress

Regularly pressing an ice pack or cold compress to the outside of your cheek may provide pain relief. By narrowing blood vessels in the affected location, the cold compress helps to relieve pain and lessen swelling and inflammation. Cold compresses can ease pain and suffering momentarily, but they don't deal with the root cause of the toothache. Using a cold compress is not a permanent fix or an alternative to visiting a dentist. If a cavity is the cause of your pain, you need to see a dentist for adequate oral care in order to find a long-term treatment [7].

Clove oil

One natural remedy for tooth cavity discomfort is clove oil. This essential oil may provide a short-term relief from tooth cavity-related dental discomfort. Using a cotton ball soaked with a few drops of clove oil, carefully apply the mixture to the tooth's problematic area as a homemade tooth cavity cure. Eugenol, the active component, reduces inflammation and discomfort by acting as a natural anesthetic with antibacterial qualities. Clove oil relieves symptoms, but it doesn't deal with the underlying source of the problem. Furthermore, some people may find this cure less tempting due to its disagreeable taste.

Conclusion

Dental pain are mostly seen younger individuals due their oral hygiene habits. Treating them in the initial stages can be helpful for the prevention of spreading [10]. For emergency treatment Non steroidal anti inflammatory drugs, opioids, antibiotics can be used. Proper treatment should be done by diagnosing the disease and cause by proper history taking and examination. Management is consistent with expected pain intensity and minimizes the risk of adverse effects associated with treatment.

Bibliography

1. MacAuley Y., *et al*. "Dental pain". *BMJ* 347 (2013): f6539.

2. Aminoshariae A and Kulild JC. "Evidence-based recommendations for antibiotic usage to treat endodontic infections and pain: A systematic review of randomized controlled trials". *Journal of the American Dental Association* 147.3 (2016): 186-191.

3. Trowbridge HO. "Review of dental pain--histology and physiology". *Journal of Endodontics* 12.10 (1986): 445-452.

4. Renton T. "Dental (Odontogenic) Pain". *Reviews in Pain* 5.1 (2011): 2-7.

5. Timmerman A and Parashos P. "Management of dental pain in primary care". *Australian Prescriber* 43.2 (2020): 39-44.

6. Ashley PF., *et al*. "Sedation for dental treatment of children in the primary care sector (UK)". *British Dental Journal* 208.11 (2010): E21, 522-523.

7. Hargreaves K and Abbott PV. "Drugs for pain management in dentistry". *Australian Dental Journal* 50 (2005): S14-22.

8. Moore PA and Hersh EV. "Combining ibuprofen and acetaminophen for acute pain management after third-molar extractions: translating clinical research to dental practice". *Journal of the American Dental Association* 144.8 (2013): 898-908.

9. Hemalatha D M., *et al*. "Antibiotics in Periodontics- A Review". *EC Dental Science* 21.11 (2022): 28-33.

10. De Laat A. "Differential diagnosis of toothache to prevent erroneous and unnecessary dental treatment". *Journal of Oral Rehabilitation* 47.6 (2020): 775-781.