

Pharmacological management of acute dental pain

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Précis: The recent withdrawal of a popular analgesic medication by the Irish Medicines Board has raised a number of important questions regarding the use of analgesics for acute dental pain. This short article reviews some of the principles of analgesic usage and outlines the scope of available prescription drugs.

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Controlling pain that arises from dental disease or procedures is a fundamental component of satisfactory patient care. Toothache is potentially one of the most distressing pains we can experience. Numerous factors are associated with this phenomenon including the density of pulpal innervation and the high level of attention focused by the brain on the orofacial region. Fear of pain and dental phobia prevents many patients from ever seeking dental care. Classical toothache is dull, aching and prolonged, when the pulp is inflamed. Non-steroidal anti-inflammatory drugs (NSAIDs) would therefore seem to be the medication of choice for most dental pains; however, the situation is slightly more complex.

From a physiological perspective, most dental pain is inflammatory in nature because of its origin in dental disease or injury, and is more correctly termed 'nociceptive pain'. The World Health Organisation (WHO) has produced an analgesic ladder as a guide for prescribing analgesics. If the first step does not produce adequate analgesia, the patient then progresses to the next step.

Step one

The first step of the analgesic ladder is to use a non-opiate analgesic, for example paracetamol (acetaminophen). This effective analgesic/antipyretic is rapidly absorbed after oral administration. Its mechanism of action remains unclear. Available in tablet, soluble (effervescent) and liquid forms, the normal adult dosage is 1,000mg three or four times per day for moderate to severe pain. Renal or hepatic impairment limits the use of this medication; however, paracetamol has fewer side effects than NSAIDs and can be used when the latter are contraindicated (e.g., patients with a history of asthma or peptic ulcers).

To improve analgesic efficacy and treat symptoms other than pain (e.g., inflammation or swelling), NSAIDs may be added to the analgesic regime. The combination of paracetamol and an NSAID provides a superior level of analgesia than either medication used alone. Unfortunately, NSAIDs have significant contraindications and adverse effects. Careful patient selection is imperative if these unwanted effects are to be avoided. These medications work by limiting prostaglandin synthesis through inhibition of the cyclo-oxygenase enzyme (COX). At least two types, COX-1 and COX-2, have been identified, and a third (COX-3) is being investigated. Apart from their involvement in pain signalling, prostaglandins have important protective physiological roles. Disruption of these physiological processes may result in serious adverse effects for the patient. COX-2 inhibitors are known to be effective for dental pain, and the comparatively low level of gastric irritation initially promised significant advantage over traditional NSAIDs. Unfortunately, the cardiovascular effects associated with long-term use have raised serious questions about their safety. While a number of these drugs have been withdrawn from the Irish market, etoricoxib (Arcoxia) and celecoxib (Celebrex) are still available, but are licensed only for osteoarthritis; however, etoricoxib is currently licensed in the UK for dental pain. The role of COX-2 inhibitors in the management of acute dental pain is likely to be the subject of further discussion and research.

Clinicians are sometimes confused by the number of NSAIDs available. Several useful references can be accessed on the internet, which detail the relative efficacy of analgesics in table form. In addition, *MIMS* (Ireland) contains details of NSAIDs currently licensed for either dental or postoperative pain (listed under the heading 'Pain and inflammation of the musculoskeletal system'). Ibuprofen taken in doses of 400-600mg (up to four times per day) is frequently recommended for moderate to severe dental pain in standard texts. Biological responses to prescribed analgesics may vary. Important influences include genetic traits, which determine how medications are metabolised by each individual. A sensible approach is to ask the patient what analgesics they have taken before and how well they responded to these. The rule of thumb in prescribing NSAIDs is that relatively low doses are required for pain relief, while higher doses are required to effectively reduce the inflammatory response. While most preparations are available in tablet or capsule form for oral administration, there may be some advantage in using a liquid gel or effervescent formulation. NSAIDs can also be administered as a suppository and the rapid onset of effect, coupled with the higher blood level, may be necessary for patients with severe or unresponsive pain.

Step two

If the patient's pain is deteriorating, or unresponsive, then a mild opiate such as codeine can be added (not substituted). These medications are detailed in the Irish *MIMS* under the heading 'Pain, Pyrexia'. Codeine (8mg) is often combined with paracetamol 500mg for increased analgesic effect. Caffeine is another common constituent in these preparations (e.g., Solpadeine, Veganin) to improve absorption of the active medication into the bloodstream. Potential side effects (constipation, drowsiness) and sensitivity reactions should not be overlooked by the prescribing clinician. As one moves further up the analgesic ladder the codeine content is increased up to 30mg per tablet (e.g., Solpadol, Tylex). Naturally, the side effect profile will become more obvious and close patient supervision is required for safety.

Step three

This level includes the use of morphine, which is rarely justified in a dental setting. Apart from issues of dependence and addiction, the potential side effects place the patient at serious risk. Tramadol (proprietary names vary) is a weak opiate analgesic sometimes useful for severe pain, prescribed 50-100mg, four to six hourly.

Summary

Avoid prescribing on a random basis. A logical approach to the use of analgesic medications will maximise therapeutic benefits and limit unwanted responses.

Further reading

Internet site: Oxford league table of analgesics in acute pain. *MIMS* Ireland: For information regarding prescription details of currently available analgesics.

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