The use of analgesics in clinical practice

Edward Man-Fuk Leung *, MB BS, FRCP

Introduction

Pain is a common problem in clinical settings including dental practice. An effective management of pain helps improve the quality of life of dental patients. Physiological benefit and improved outcomes are shown to be associated with postoperative pain relief.

An increased understanding of the neurohormonal mechanism of pain has improved the effectiveness of pharmacological and non-pharmacological approaches to pain management. The use of a combination of drugs with different mechanisms can optimize their individual analgesic effects. In addition, different physical measures can help improve control of acute and chronic pain. This paper reviews pharmacological and non-pharmacological methods of pain control and their application in clinical practice.

Pharmacological measures

Nonsteroidal anti-inflammatory drugs and COX-2 inhibitors

Oral nonsteroidal anti-inflammatory drugs (NSAIDs) have long been prescribed for non-surgical pain syndromes because of their well-known anti-inflammatory, antipyretic, and analgesic properties. In surgery, NSAIDs are alleged to reduce peripheral nociception by reducing the inflammatory response to surgical trauma. Oral or rectal administration provides effective and economic prophylactic management of surgical pain. A 400 mg stat dose of ibuprofen provides highly effective postoperative analgesia following oral surgery 1. Nonetheless gastro-intestinal side-effects are common following NSAID use: dyspepsia, gastric ulceration or bleeding, and perforation. The addition of a proton pump inhibitor can provide partial protection against gastric and duodenal ulcers 2. Nonsteroidal anti-inflammatory drugs can also occasionally cause central nervous system dysfunction, resulting in decreased attention span, loss of short-term memory, and difficulty with calculations.

The development of selective COX-2 inhibitors aimed to reduce the gastro-intestinal morbidity associated with NSAID use. Nonetheless they can increase patients’ risk for heart attack and stroke, particularly in those with pre-existing hypertension, hyperlipidemia, diabetes, or a family history of cardiovascular disease. As a result, two COX-2 inhibitors, rofecoxib and valdecoxib, have been voluntarily withdrawn from the market. The U.S. Food and Drug Administration has also requested that a warning of an increased risk of cardiovascular complications be issued for the remaining COX-2 inhibitor, celecoxib.

Paracetamol

Paracetamol is the safest and most cost-effective non-opioid analgesic, even more effective when prescribed together with an NSAID 3,4. Paracetamol is also associated with less risk of ulcers and ulcer complications, and is rarely associated with renal toxicity. Doses exceeding 4 to 6 g per day may nonetheless be hepatotoxic.

Antidepressants

Tricyclic antidepressants inhibit neuronal reuptake of the neurotransmitters serotonin and noradrenaline. Their analgesic effects independent of antidepressant effects was demonstrated in a controlled trial 5. Tricyclic antidepressants are thus often prescribed for their synergistic effects in addition to their analgesic effects. Low-dose nortriptyline and amitriptyline are two such examples.

Gabapentin

Gabapentin is an anticonvulsant that has proven to be useful in the treatment of chronic neuropathic pain and may also be a useful adjunct in the management of acute postoperative pain.
Non-pharmacological measures

Non-pharmacological techniques such as transcutaneous electrical nerve stimulation (TENS), acupuncture-like TENS, and percutaneous neuromodulation therapy are useful adjuvants to pharmacological compounds in the management of acute postoperative pain 6.

Conclusion

The use of combinations of analgesic drugs with different mechanisms of action as part of a multimodal regimen provides additive effects in improving pain control and facilitating the recovery.

References