

Buprenorphine – a review of its role in neuropathic pain

Aachen, Germany, 11 January, 2008. Affecting about 1% of the population, neuropathic pain has a debilitating effect on sufferers and its treatment remains a challenge for physicians. Responses to single drugs are limited in benefit and the use of opioids for treatment of neuropathic pain is still somewhat controversial, since earlier studies have indicated that neuropathic pain is generally less responsive to pure μ -opioid analgesics. Recent evidence has suggested that different opioids affect different pathways and the unique analgesic profile of buprenorphine can be of benefit in the effective treatment of neuropathic pain.

Neuropathic pain is characterized by stimulus-independent persistent pain and abnormal activity-related pain perception, normally presenting as allodynia (pain from a normally innocuous stimulus) or hyperalgesia (exaggerated pain response to a pain stimulus). The use of opioids is often second-line to tricyclic antidepressant and anti-epileptic drugs because neuropathic pain is found to be less responsive to pure μ -opioid analgesics. In recent years, it has become evident that the partial μ -agonist buprenorphine has a unique hyperalgesia / analgesia ratio which is distinctly different compared to pure μ -agonists and makes it a suitable candidate for the treatment of neuropathic pain.

A new review has highlighted the potential for the use of buprenorphine in the treatment of neuropathic pain

- Buprenorphine's distinctive analgesic mechanisms have been demonstrated using a number of assays of various pain types, e.g. the formalin test in neonatal rats or animal models of photochemically induced peripheral nerve and spinal cord injury pain. Even at high doses buprenorphine caused no sedation.
- In humans, sublingual and iv buprenorphine have been used to treat electrically induced pin-prick hyperalgesia and touch-evoked allodynia and demonstrated a lasting antihyperalgesic effect without any rebound phenomenon.
- In clinical studies, oral, intrathecal, iv and transdermal buprenorphine provided pain relief for post amputation phantom limb pain, neuropathic pain following thoracic surgery and neuropathic pain of both cancer and non-cancer origin.

In humans buprenorphine shows no relevant ceiling effect in pain inhibition in the analgesic dose range. The use of buprenorphine is associated with a lower

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incidence of adverse events than other opioids. The risk of respiratory depression is also low and, in contrast to morphine or fentanyl, shows a ceiling effect at higher doses. All these features confer a favourable tolerability and safety profile on the drug. The availability of Transtec®, a patch matrix system of buprenorphine, allows passive transdermal diffusion of the medication over a prolonged period, whilst maintaining a constant therapeutic dose. In addition, the patch formulation allows easy twice weekly application, favouring high compliance.

The clinical efficacy of transdermal buprenorphine for neuropathic pain has been demonstrated in a number of clinical trials:

- Patients with non-malignant neuropathic pain found buprenorphine provided effective pain relief, increased quality of sleep and, through ease of application, high user compliance.
- **Case studies of patients with nerve-injury-induced pain showed buprenorphine provided prolonged pain relief with fewer episodes of breakthrough pain compared with fentanyl.**
- In long term studies including patients with neuropathic pain, transdermal buprenorphine was effective in controlling pain without the need to significantly increase the dose. Treatment was generally well tolerated.

These studies indicate the **potential effectiveness of buprenorphine in the treatment of neuropathic pain**, particularly in the management of hyperalgesic states and syndromes characterized by the presence of pronounced central sensitization.

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Literature

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