The effectiveness of transdermal fentanyl in palliative care

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Current literature suggests that transdermal fentanyl is efficacious in relieving cancer-related pain with less opioid-related constipation than morphine for patients in the palliative care setting. However, randomised controlled trials are needed to study the drug’s efficacy compared with other level-three opioids that are used to manage cancer-related pain in palliative care.

Health care professionals must utilise best evidence-based practice in order not only to meet the requirements of government and professional guidelines, but also provide patients with efficacious therapeutic interventions tailored to their individual holistic needs and find a balance in terms of the risk:benefit ratio (Hewitt-Taylor, 2002; Lugton and Kindlen 2000).

**The use of transdermal fentanyl**

The use of transdermal fentanyl has been suggested as an alternative to oral morphine for the management of cancer pain when the oral route is no longer viable. However, few significant evidence-based guidelines for nursing practice have been introduced (Ling, 1997; Ahmedzai et al, 1994). This article aims to appraise the efficacy of transdermal fentanyl in the management of cancer pain in the palliative care setting within the context of evidence-based practice. However, it is acknowledged that appropriate pharmacological intervention is only one fragment of the entire palliative care process (Lugton and Kindlen, 2000).

**The action of fentanyl**

Fentanyl is an opioid analgesic and a strong agonist with an affinity to the Mu receptor (Twycross et al, 1999). Transdermal pharmacological intervention is a non-invasive method of administering this low molecular weight, highly lipid-soluble, level-three potent opioid (Janssen Pharmaceuticals, 2001). This gives clinicians the opportunity to improve patients’ quality of life by avoiding invasive treatment (Ling, 1997).

Because fentanyl is highly soluble in lipids it can move across the blood-brain barrier more freely than morphine (Janssen Pharmaceuticals, 2001). Transdermal administration limits the gastrointestinal concentration and consequently has a less significant effect on the opioid receptors in the gut, causing less constipation than oral morphine (Ellershaw et al, 2002; Janssen Pharmaceuticals, 2001; Radbruch et al, 2001; 2000; Twycross et al, 1999; Payne, 1998; Wakefield et al, 1998; Ahmedzai and Brook, 1997; Ling, 1997; Ahmedzai et al, 1994).

Transdermal fentanyl administers a controlled dose of fentanyl for up to 72 hours, the amount per hour determined by the surface area of the patch (25, 50, 75 or 100 micrograms per hour). It is usually administered to patients with stable, chronic, intractable cancer-related pain for whom the oral route of administration is no longer an option (Janssen Pharmaceuticals, 2001; Twycross et al, 1999).

However, transdermal fentanyl is contraindicated for the management of acute or postoperative pain and for patients with unstable pain that requires rapid or frequent titration (Janssen Pharmaceuticals, 2001; Twycross et al, 1999).

**Adverse effects of fentanyl**

As with all opioid analgesics, fentanyl may result in undesirable side-effects and particular nursing interventions are needed to manage patients being treated with transdermal fentanyl (Twycross et al, 1999). Although these issues are not discussed in this article, information and guidelines for health care professionals to use are available (Janssen Pharmaceuticals, 2001; Twycross et al, 1999).

Of all the studies appraised, only two were suitable for direct comparison of efficacy data for adverse effects (Radbruch et al, 2001; Ahmedzai and Brook, 1997). The data is shown in Fig 1. The evidence presented is supported by other studies (Ellershaw et al, 2002; Breitbart et al, 2000; Radbruch et al, 2000; Payne, 1998; Wakefield et al, 1998; Ling, 1997; Ahmedzai et al, 1994) despite being measured using different methodologies (Couchman and Dawson, 1999).

None of the studies cited identified any significance in the experience of adverse effects except opioid-related constipation. Data from three studies could be collated to identify a repetitive trend in relation to this side-effect (Radbruch et al, 2001; 2000; Ahmedzai and Brook, 1997) and this is shown in Fig 2. Therefore, it is reasonable to suggest that transdermal fentanyl reduces the effect of opioid-related constipation for patients with cancer.

It is interesting to note that Radbruch et al (2000) report that 35 per cent of patients experienced transdermal fentanyl-related constipation, but only four per cent experienced this side-effect in a later study by the same authors (Radbruch et al, 2001).

While this could be a biased result, the earlier study included only 23 patients while the later one included...
It is therefore more likely that transdermal fentanyl reduces constipation without compromising the efficacy of pain relief.

**Pain control**

Sander and Russell (2001) state that:
- 63 per cent of patients with cancer have constipation;
- 88 per cent experience pain;
- 59 per cent are affected by nausea and vomiting;
- 54 per cent have breathlessness.

Therefore a need is identified for research into cancer pain management. Incurable disease often equates with progressive and chronic pain. Trevatt (2003) identified inappropriate pain management for cancer patients within the palliative care setting. Patients often receive sub-optimal pain relief because doctors are reluctant to prescribe opioids and patients are reluctant to take them due to misconceptions and stigma associated with this type of drug (Ling, 1997).

These misconceptions are often rooted in fear of dependence and the hastening of death. However, the literature does not reveal any evidence to support these fears (Ellershaw et al 2002; Janssen Pharmaceuticals, 2001; Radbruch et al, 2001; 2000; Breitbart et al, 2000; Twycross et al 1999; Payne, 1998; Wakefield et al 1998; Ahmedzai and Brook, 1997; Ahmedzai et al, 1994; Ling, 1997).

The evaluation of effective pain control is an arbitrary issue. Pain assessment is qualitative and subjective because the pain experience is unique to the individual and a multimodal strategy is needed to address all its biopsychosocial components (Holdcroft and Poewe, 2003; Ellershaw et al, 2002; Janssen Pharmaceuticals, 2001; Radbruch et al, 2001; 2000; Breitbart et al, 2000; Carr and Mann, 2000; Davies and McVicar, 2000; Twycross et al, 1999; Payne, 1998; Wakefield et al, 1998; Ahmedzai and Brook, 1997; Ling, 1997; Ahmedzai et al, 1994).

Furthermore, when comparing the efficacy of opioids they must be administered in equi-analgesic doses for any data to be valid and reliable (McQuay, 1999). The literature, therefore, presents a maze of confusing and conflicting evidence relating to equi-analgesic doses, despite concluding that there is no significant difference in levels of pain relief between opioids.

To further complicate the issue, Breitbart et al (2000) offer a substantial argument suggesting that the use of the manufacturer’s conversion guidelines causes patients to experience ineffective pain relief initially. Application of their alternative algorithm for dose conversion to the review studies revealed that all the evidence put forward regarding pain control efficacy compared with other opioids is unreliable (Couchman and Dawson, 1999). However, this issue requires evidence confirmed by randomised control trials before the guidelines are implemented within nursing practice.

Most of the studies used the manufacturer’s conversion guidelines, which suggests a comparison of equi-analgesic doses. However, there was no evidence that the amount of breakthrough pain relief medication used by patients in conjunction with either transdermal fentanyl or morphine was controlled throughout any study period (Ellershaw et al, 2002; Radbruch et al, 2001; 2000; Ahmedzai and Brook, 1997; Ahmedzai et al, 1994). Breakthrough pain medication will interfere with the effects of transdermal fentanyl related to pain control and, therefore, produce variables within any evidence measuring the efficacy of pain control (Radbruch et al, 2000).

**Conclusion**

Palliative care interventions lack an evidence base rooted in research with which to inform nursing practice. This is particularly the case with the management of cancer-related pain. Within the context of current government initiatives and professional requirements, this literature review aimed to determine the efficacy of transdermal fentanyl for cancer-related pain in palliative care.

Transdermal fentanyl is efficacious in relieving cancer-related pain with less opioid-related constipation than oral morphine. However, there is a need for future randomised controlled trials to study its efficacy compared with other level three opioids of equi-analgesic doses that are used to manage cancer-related pain in palliative care.

**REFERENCES**


