**Title:**

A novel approach to pain control after total knee replacement: an evaluation of the sublingual sufentanil patient controlled analgesia device.

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**Background:**

A trust audit of post-operative pain following total knee replacement (TKR) revealed the first 12 hours after surgery are generally pain free due to spinal and regional anaesthesia. However, 65% of patients experience ‘severe’ pain on their first post-operative day despite current standard treatment (regular paracetamol, non-steroidal anti-inflammatories, oxycodone and gabapentin).

The use of oral opioids is increasing, as they encourage mobility and compliance with physiotherapy goals compared to intravenous patient controlled analgesia (PCA). However, one disadvantage of oral opioids is the nursing time required to administer controlled drugs, especially if multiple breakthrough doses are required.

We undertook an evaluation of a sublingual sufentanil PCA system (SS-PCA) in our patients undergoing TKR. A 15 microgram sufentanil tablet is administered via a pre-programmed, patient-controlled, non-invasive handheld device. Sufentanil is a short acting opioid with comparable side effects to morphine. It has already been shown to be safe and efficacious compared with morphine PCA1 and is approved and recommended by the National Institute of Clinical excellence (NICE)2.

**Aims and Objectives:**

To assess the efficacy of SS-PCA in reducing post-operative pain in our patients undergoing TKR.

**Methods:**

A prospective non-randomised questionnaire based drug evaluation study was undertaken. Ethical approval was not required. All patients undergoing elective TKR were included during the study dates.

Patients were given oral and written information explaining the device and the SS-PCA was commenced post-operatively in theatre recovery.

Anaesthetic and regional block techniques were not controlled. Additional opiates were restricted to fentanyl and gabapentin was omitted.

Pain scores were recorded 4 hourly on a standard 10 point visual analogue scale (VAS) by nursing staff and all patients were reviewed daily by our inpatient pain sister who recorded any adverse events. ‘Severe’ pain was deemed a pain score greater than 6.

On discontinuation of the treatment patients and staff nurses completed questionnaires evaluating the SS-PCA on a series of Likert scaled statements and free text answers.

**Main Results:**

31 patients undergoing elective TKR received post-operative SS-PCA. 3.6% (n=1) reported severe pain on post op day 1 compared with 65% in our retrospectively collated audit of ‘standard’ treatment. 9.7% (n=3) patients were unable to tolerate SS-PCA due to nausea and 83% would recommend it to a friend or use it again for post-operative pain relief.

Nursing staff reported that SS-PCA saved considerable time (median agreement with “*80% time saved*”) compared to standard treatment and they reported that pain was managed *“70% better”* using SS-PCA versus standard treatment.

All staff and patients agreed that “*the device was* *very easy to use*”.

**Conclusions:**

SS-PCA offers effective analgesia in patients undergoing elective TKR, with patients reporting low pain scores and minimal associated nausea. Nursing staff find it easy to use, less time consuming and perceive its efficacy far superior to standard treatment.

We are currently undertaking a formulary application to get sufentanil added so that we can use it routinely in all TKR patients.

We may expand the use of SS-PCA to include other surgical specialties such as gynaecology and colorectal surgery.

**References:**

**1.** Melson, T. I., Boyer, D. L., Minkowitz, H. S., Turan, A., Chiang, Y.-K., Evashenk, M. A. and Palmer, P. P. (2014), Sufentanil Sublingual Tablet System vs. Intravenous Patient-Controlled Analgesia with Morphine for Postoperative Pain Control: A Randomized, Active-Comparator Trial. Pain Pract, 14: 679–688. doi:10.1111/papr.12238

**2.** NICE Guidance. Moderate to severe acute post­-operative pain: sufentanil sublingual tablet system. Evidence summary [ESNM71] Published March 2016

https://www.nice.org.uk/advice/esnm71/chapter/Full-evidence-summary

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