Transdermal opioids for acute postoperative pain: A road less travelled!

Dear Editor,

Transdermal delivery system (TDS) is a simple, reliable, noninvasive analgesic delivery method that has been used extensively for chronic pain management. After application, drug in TDS forms a depot in the upper layers of skin that slowly increases serum concentration. Both fentanyl and buprenorphine have high lipid solubility and low molecular weight which makes them ideal candidates for a TDS. The perceived advantages of TDS for acute postoperative pain include sustained blood level of the drug and reduced side effects. Transdermal buprenorphine (TDB) provides convenient once-weekly dosing, has ceiling effect for respiratory, lower abuse potential, and does not require dose alterations patients with renal dysfunction, unlike fentanyl (full μ-opioid receptor agonist).

Khandelwal et al. compared two doses of buprenorphine (10μg/h⁻¹ and 20μg/h⁻¹) with fentanyl (25μg/h⁻¹) in adult patients undergoing lower limb arthroscopic surgery. They found TDB patch (20μg/h⁻¹) to be an effective postoperative analgesic without any significant undesirable effects.

The concentration of TDS drugs tends to be higher in the first 24 h and several factors like variability in body temperature, factors that increase cutaneous blood flow (warming blanket, sepsis or regional anesthesia), previous opioid use, hemodynamics, and patient’s general condition may make TDS opioid absorption unpredictable. There have been reports of serious, life-threatening respiratory depression and death following transdermal fentanyl, mentioned as an important warning by the drug manufacturers themselves. Buprenorphine is 60 times while fentanyl is 100 times as potent as morphine and the duration of action for fentanyl (3d) and TBD (7d) is different. So, equianalgesic doses of both (ratio 3:5) should be compared but the authors in the study have used a non-equianalgesic dosage (10:25 and 20:25). Also, the different. Most importantly, they are expensive and may not be ideal in our setting.

The peak effect comes in 12 h (fentanyl) to 24 h (buprenorphine). So, the patches are generally applied a day before surgery, but this may not be the ideal scenario in daycares settings. Alternative analgesics should be started till the effect of TDS drugs comes in 12–24 h, whereas in the index study, the usual analgesics were withheld the day before surgery when the patches were applied.

Many dose formulations are available and selecting the right dose in opioid naïve patients is a challenge. According to recommendations from the manufacturer, opioid-naive patients should initially receive the lowest strength patch.

Authors of present study evaluating the use of TDS in postoperative pain management concluded that further
prospective randomized studies are required to conclusively find the optimum dose.[3]

TDS are amenable to abuse, serious side effects like respiratory depression, and cognitive dysfunction, may increase duration of hospital stay and overall cost of daycare procedures. Despite their success for chronic pain management, TDS opioids for acute postoperative pain is a new and off-label use and should be undertaken if the benefits outweigh the risks involved. The main rebuke for TDS is its lack of titrability, long latency for onset, and slow offset making it an inferior alternative compared to other commonly used modes of analgesic delivery such as patient-controlled analgesia. Moreover, they are an expensive alternative to parenteral and oral drugs.

Hence, we would urge caution in the indiscriminate usage of TDS as a sole modality of postoperative analgesia until further robust evidence proves the contrary. Whenever chosen, they should be used in monitored settings for opioid naïve patients.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Nishkarsh Gupta, Anju Gupta
Onco-Anaesthesiology and Palliative Medicine, DRBRAIRCH, AIIMS, 1Department of Anesthesiology, Pain Medicine and Critical Care, All India Institute of Medical Sciences, New Delhi, India

Address for correspondence: Dr. Anju Gupta, Department of Anesthesiology, Pain Medicine and Critical Care, All India Institute of Medical Sciences, R. NO. 6, Porta Cabin, Teaching Block, Ansari Nagar, New Delhi - 110 029, India.
E-mail: dranjugupta2009@rediffmail.com

References
1. Tassinari D, Sartori S, Tamburini E, Scarpi E, Raffaeli W, Tombesi P, et al. Adverse effects of transdermal opiates treating moderate-severe cancer pain in comparison to long-acting morphine: A meta-analysis and systematic review of the literature. J Palliat Med 2008;11:492-501.
2. Kress HG. Clinical update on the pharmacology, efficacy and safety of transdermal buprenorphine. Eur J of Pain 2009;13:219-30.
3. Khandelwal H, Negi A, Govil N, Singh A, Parag K, Bhardwaj BB. Comparative evaluation of analgesic efficacy of buprenorphine transdermal patch and fentanyl patch in the management of postoperative pain after arthroscopic lower limb surgery: A randomized controlled trial. J Anaesthesiol Clin Pharmacol 2021;37:272-8.
4. Dave S, Shriyan D, Guijar P. Newer drug delivery systems in anaesthesia. J Anaesthesiol Clin Pharmacol 2017;33:157-63.
5. Grunenthal GmbH. Transtec (R) Scientific Monograph. Aachen: Grunenthal GmbH; 2002.

How to cite this article: Gupta N, Gupta A. Transdermal opioids for acute postoperative pain: A road less travelled!. J Anaesthesiol Clin Pharmacol 2022;38:159-60.

Submitted: 23-Jun-2019 Accepted: 26-Aug-2019 Published: 25-Apr-2022 © 2022 Journal of Anaesthesiology Clinical Pharmacology | Published by Wolters Kluwer - Medknow