Novel treatment (new drug/intervention; established drug/procedure in new situation)

Topical lidocaine patch 5% for acute postoperative pain control

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Summary

A 39-year-old para 3 woman presented for elective caesarean section (lower segment caesarean section (LSCS)) for breech presentation. The patient had a strong history of atopy and anaphylaxis to paracetamol, codeine, penicillin and latex. The patient was asthmatic, triggered by aspirin. Epidural anaesthesia was unsuccessful and LSCS was carried out under spinal anaesthesia. Postoperatively the patient was unwilling to take analgesic medication due to fear of an allergic reaction. Three 5% lidocaine patches were applied to the wound for postoperative analgesia. This reduced the patient's visual analogue scale pain score from 10/10 to 5/10 at rest and 10/10 to 7/10 with movement. Transcutaneous electrical nerve stimulation was added and this improved associated back pain, reducing the pain further to 2/10. This is the first description of lignocaine patch 5% for postoperative LSCS pain. It is suggested that this method of delivery of local anaesthetic, which is easy to apply and has minimal side effects, should be considered not as a sole agent but as part of a multimodal technique to address postoperative LSCS pain.

BACKGROUND

One of the main goals of anaesthetists is to provide effective postoperative analgesia while minimising systemic side effects. This is usually achieved by using a multimodal technique¹ incorporating regional or central neuroaxial anaesthesia, medications including opiates, non-steroidal anti-inflammatory drugs and paracetamol, as well as infiltration of the wound with local anaesthetic. The combination of different analgesics and/or regional anaesthesia has an opioid sparing effect,² thereby reducing opiate side effects that can impede recovery. We present a case that demonstrates significant postoperative lower segment caesarean section (LSCS) analgesia with lignocaine patch 5% and suggest that it may offer additional benefit to multimodal analgesia post LSCS.

CASE PRESENTATION

A 39-year-old para 3 woman presented for elective LSCS for breech presentation at 39 weeks. The patient had had one previous LSCS under epidural anaesthesia and two spontaneous vaginal deliveries. Postoperative analgesia after the patient's previous LSCS was provided by epidural infusion for 24 h and after discontinuation of the infusion the patient had refused all analgesics.

The patient had a background history of severe asthma triggered by aspirin. Allergy testing had shown a strong reaction to paracetamol, codeine, penicillin and latex. It was not known whether the patient was allergic to other opioids. The patient also has food allergies and had had an anaphylactic reaction to kiwi fruit 9 years previously. At preassessment clinic it was planned that surgery would be carried out under epidural anaesthesia with epidural infusion providing postoperative analgesia.

However, on the day of surgery the epidural catheter insertion was unsuccessful and surgery was carried out under spinal anaesthesia (bupivacaine 0.5%, 2.4 cm³); a

healthy baby boy was delivered uneventfully. A spinal catheter was not inserted preoperatively as our institution has opted for the epidural route only for postoperative neuroaxial analgesia in order to minimise the risk of inadvertent injection of an epidural dose of local anaesthetic into the intrathecal space. The patient was unwilling to undergo any further attempts at epidural catheter insertion postoperatively and the patient refused all analgesic medication because of fear of allergic reaction.

It was considered that a transversus abdominis plane block would also be difficult due to the laxity of the abdominal muscles post delivery, and the patient was reluctant to undergo further injection. We therefore decided to try, in the first instance, topical lignocaine patch 5% application for postoperative analgesia.

TREATMENT

Three lignocaine 5% patches were applied to the area around the abdominal wound. Due to space availability, two were placed above the wound and one was placed below the wound. The wound dressing, which extended approximately 1 cm each side of the wound, was not removed. Prior to application the patient's visual analogue scale (VAS) score (0=no pain, 10=worst pain imaginable) of postoperative pain was reported as 10/10. Within 1 h VAS had reduced from 10/10 to 5/10 at rest and 7/10 with movement.

The patient had back pain and application of transcutaneous electrical nerve stimulation to the patient's lower back improved the patient's pain further to 2/10 at rest and on movement. The lignocaine 5% patches were applied for a total of 12 h per day. After removal the patient's pain gradually increased before the next patch was applied.

On day 2 we noted that the patient's pain reduced from 7/10 to 4/10 at rest and interestingly from 10/10 to 5/10 with movement after application of the lignocaine patch.

Figure 1 Pain scores.

On day 3 the patient's pain reduced from 8/10 to 4/10 at rest and from 10/10 to 5/10 on movement and on day 4 from 7/10 to 5/10 at rest and from 9/10 to 5/10 with movement.

OUTCOME AND FOLLOW-UP

The patient reported that the lignocaine patches definitely helped her postoperative pain. Of note, although the pain levels were less at rest when the patches were applied, the patient felt that there was a more dramatic reduction in movement pain after application.

On discharge the patient was referred for further allergy testing for sensitivities to analgesics after discharge.

DISCUSSION

This case demonstrates that lignocaine patch 5% can provide moderate postoperative pain relief after LSCS. Lignocaine patch 5% is licensed for the management of postherpetic neuralgia (PHN). However, it has also been shown to be of benefit for other pain syndromes, for example, myofascial pain³ and other neuropathic pain syndromes.^{4,5} It is comprised of an adhesive material containing 5% lidocaine, which is applied to a polyester felt backing. Each adhesive patch contains 700 mg of lidocaine (50 mg per g adhesive) in an aqueous base. The precise mechanism of action is unknown. Systemic absorption is minimal at 3% $\pm$ 2% (mean $\pm$ SD)⁵ and, unlike eutectic mixture of lignocaine 2.5% and prilocaine 2.5% (eutectic mixture of local anaesthetics (EMLA)) cream application, does not result in skin anaesthesia underneath the patch.⁶ It is postulated that lignocaine patch 5% reduces ectopic firing of nerve impulses of nociceptors in damaged tissues but that the amounts absorbed are insufficient to block

large myelinated sensory fibres.⁶ EMLA cream does produce local anaesthesia of the skin to which it is applied, and it has been used topically for neuropathic pain.⁷ However, it requires several applications per day and is not as easy to apply as the lignocaine patch 5%.

Lignocaine is excreted in breast milk but no pharmacokinetic studies have been carried out in women who are breastfeeding. However, as absorption is minimal and metabolism occurs rapidly in the liver, only very low levels of lignocaine would be expected to be present in human breast milk.

This case report demonstrated a reduction in postoperative LSCS pain score (figure 1) with the use of lignocaine patch 5%. A placebo effect cannot be ruled out in this highly motivated patient who was fearful of allergic reactions. However, to date, two randomised controlled trials have been published that have demonstrated postoperative analgesic benefit from lignocaine patch, one after radical retropubic prostatectomy (RRP)⁸ and one after laparoscopic herniorrhaphy.⁹ The onset of significant pain relief after application of lignocaine patch in these studies, as well as in another study comparing it to placebo for PHN, has been reported to commence after 30 min,^{6,10} and this is similar to the time of onset of analgesic effect reported in this case. These studies support the probability that pain relief after application of lignocaine patch 5% is not a placebo effect.

In this case study the patient noticed a relatively more dramatic reduction in pain on movement than pain at rest after the patch was applied. Interestingly, in the study on the use of lignocaine patch 5% post RRP, pain on coughing was found to be significantly reduced in those who received lignocaine patch when compared to those who received placebo. These patients also reported significantly

Learning points

- Postoperative pain after lower segment caesarean section (LSCS) may be moderately relieved by application of lignocaine patch 5%.
- Patients post LSCS may benefit from multimodal postoperative analgesia incorporating lignocaine patch 5%.
- Randomised clinical trials should be carried out to investigate the efficacy of lignocaine patch for postoperative pain as part of a multimodal analgesic technique after LSCS.

less interference from pain on their ability to mobilise, although overall morphine consumption was not reduced.

Further research is warranted into the use of this formulation of local anaesthetic delivery for postoperative LSCS pain as part of a multimodal analgesic technique.

Competing interests None.

Patient consent Obtained.

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Gilhooly D, McGarvey B, O'Mahony H, O'Connor TC. Topical lidocaine patch 5% for acute postoperative pain control. *BMJ Case Reports* 2011; 10.1136/bcr.06.2010.3074, date of publication

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