**OAA commentary on alternatives to intrathecal and epidural diamorphine for caesarean section analgesia**

Introduction

NICE recommends the use of intrathecal or epidural diamorphine for intraoperative anaesthesia and postoperative analgesia.[1] However, there have been issues with the production of diamorphine in the UK, causing intermittent shortages. Whilst diamorphine has several clinical applications, it can often be substituted by other opioids such as morphine. Diamorphine's physical properties mean that when administered via the neuraxial route, it has a rapid onset of action and provides analgesia for up to 12 hours postoperatively. Elsewhere in the world, morphine is used for this purpose; in contrast, its onset is slow, and the analgesic action (and risk of respiratory depression) can persist for up to 24 hours. In addition, the incidence of pruritus and nausea and vomiting is greater.[2,3] If intrathecal morphine is used for caesarean section, it is usually combined with a more lipophilic opioid such as fentanyl to achieve good intraoperative analgesia.

Strategies for preserving supplies of diamorphine

Many clinical applications of diamorphine such as treatment of myocardial pain, palliative care, labour analgesia and nasal administration in children can be substituted by using other opioids such as morphine or fentanyl. Where hospitals have reduced supply, this can be diverted exclusively for use in obstetric anaesthesia such that the use in obstetric anaesthesia is not interrupted.

Some hospitals have used existing sterile drug preparation facilities to manufacture multiple intrathecal doses of diamorphine from a single ampoule.[4,5] There are many potential issues with this approach including the short shelf life of the manufactured product (often 7 days) and potential need for refrigeration of a controlled drug (some trusts do not refrigerate).

Alternatives to intrathecal/epidural diamorphine

There is a large amount of published data supporting the use of morphine combined with fentanyl as an alternative to diamorphine for caesarean section analgesia. A widely used dose is preservative-free (PF) morphine 100 micrograms with fentanyl 15 micrograms with a standard dose of hyperbaric bupivacaine. The perioperative administration of ondansetron can reduce the incidence of pruritus and nausea.[6] Preservative-free morphine is available in several preparations, with a concentration of 1mg/ml being widely available.

Risks of change to alternatives and mitigation of those risks

The risks of introducing a new analgesic regimen for spinal anaesthesia should not be underestimated, and it is essential that a training package be developed, so staff are familiar with drawing up and mixing the drugs accurately. Obstetric units are often covered by staff who do not regularly cover these units during the day. The combination of unfamiliarity of technique (preparation of two opioids for spinal injection), and the time-sensitive issues of responding to an emergency may mean that there is a role for preserving the small supplies

of diamorphine for emergency caesarean sections out of hours with morphine/fentanyl for other caesarean sections.

A common adverse event in some units has been the inadvertent administration of 0.1ml of standard preservative containing morphine (10mg/ml) instead of preservative-free morphine (1mg/ml); this would be both a drug dosing error (10X magnitude) and wrong administration route error. Therefore, it is recommended that where possible different preparations of morphine are not stored in the same drug cupboard. One common approach is to store parenteral morphine in a recovery CD cupboard and preservative-free morphine in the anaesthetic room/theatre CD cupboard. Another approach is to partition the CD cupboard into intravenous and intrathecal sections.

Suggested doses

**For caesarean section under neuraxial blockade (spinal, combined spinal-epidural or epidural top-up)**

All women receiving neuraxial blockade should be given intrathecal or epidural opioids including a long-acting opioid:

*Intrathecal doses*
300mcg diamorphine **or** 15-20 mcg fentanyl + 100 mcg preservative free morphine.

There is strong evidence to suggest that no additional analgesic benefit is conferred by doses of intrathecal morphine above 100mcg. If using larger doses there is an increased incidence of side-effects (e.g., pruritus, nausea and vomiting).

*Epidural doses*

At the end of surgery or before removal of the epidural catheter give

- 3mg diamorphine **or** 3mg preservative-free morphine
- Flush the epidural catheter with 2ml normal saline.

Monitoring after neuraxial opioids

Evidence suggests that the risk of delayed respiratory depression is extremely rare in women who have received neuraxial opioids and who do not have additional risk factors for respiratory depression.[7] NICE has recently updated its guidance and recommends that:

- For a woman who has had spinal or epidural diamorphine but is not at increased risk of respiratory depression, routine observations in accordance with local protocols are required.
- In a woman who has had spinal or epidural diamorphine and is at increased risk of respiratory depression, e.g., diagnosed obstructive sleep apnoea, additional monitoring should be undertaken for 12 hours.[1]

NICE describes the use of diamorphine and not morphine. Literature reviews examining the risk of respiratory depression with neuraxial opioids in obstetric patients rely heavily on

published evidence about the use of morphine. We, therefore, interpret NICE guidance for either diamorphine or morphine use.

**References**


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