SPINAL OPIOIDS IN POSTOPERATIVE PAIN RELIEF 2: ADVERSE EFFECTS

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This is a two-part unit on using spinal opioids to manage postoperative pain. Part 1 outlined the pharmacology of spinal opioids. Part 2 discusses the selection of patients and their nursing care. It also focuses on the incidence of and response to adverse effects. For further information on contraindications, nursing care and patients’ clinical requirements, see Portfolio Pages on nursingtimes.net

SELECTING PATIENTS
The administration of a single spinal opioid injection performed in combination with a spinal anaesthetic has the advantages of simplicity, reliability, a low dose requirement and the provision of predictable analgesia for the first 24 hours post surgery.

With spinal analgesia, there is no need for an infusion device, an infusion bag and an infusion-giving set as there is with patient-controlled analgesia (PCA) and epidural analgesia. This will result in potential financial savings.

Preoperative anaesthetic assessment is vital to assess patients’ suitability for spinal anaesthetic and a spinal opioid for postoperative analgesia (Coventry, 2007). Side-effects and potential risks must always be balanced against potential advantages.

NURSING CARE
Appropriate assessment and postoperative nursing care is essential if patients are to be safely monitored postoperatively in a general surgical clinical environment.

Patients who have received spinal opioids must only be nursed in surgical wards where staff have specific training in managing them. The support of the acute pain service is vital to help with early recognition and treatment of complications (Rawal, 2007).

It should be clearly documented on the patient’s prescription chart that they have received a spinal opioid. Giving regular paracetamol as an adjunct will improve the efficacy of opioid analgesia and, if indicated, administering an NSAID can also reduce the need for rescue opioid analgesia (McQuay and Moore, 1998).

Appropriate rescue analgesia, an anti-emetic and naloxone should also be prescribed as needed, according to unpublished adult guidance developed by Cardiff and Vale NHS Trust.

Regular observations must be completed to ensure patient safety. This is especially important with spinal morphine because of the increased potential for late onset respiratory depression. Regular assessment of postoperative pain on movement is fundamental to effective pain management and it ensures postoperative mobility is optimised. A verbal rating scale tends to be short, easy to understand and use. A visual analogue scale (VAS) is validated for clinical use but some patients find it more difficult to understand than descriptor scales (Power and Atcherson, 2007). The pain assessment tool used must be consistent, appropriate for patients to understand and for clinical staff to complete. Observation of sedation scores, as well as assessments of blood pressure, pulse, oxygen saturation and respiratory rate, are essential.

INCIDENCE OF ADVERSE EFFECTS
Irrespective of their route of administration, opioids have a similar side-effect profile including respiratory depression, sedation, pruritus, nausea, vomiting and urinary retention (Stoelting and Hillier, 2006).

The incidence of adverse effects is influenced by several factors including the route of administration, dose, patient’s physical condition and opioid tolerance. There is considerable variation in the frequency of these effects.

Respiratory depression
Respiratory depression is generally defined by a respiratory rate of less than eight respirations per minute, accompanied by an increased sedation score. It occurs at two time-points after the administration of spinal opioids.

Early respiratory depression, which is attributed to systemic opioid absorption, is typically witnessed 1–2 hours after opioid injection when the patient may still be in the post-anaesthesia care unit. Late onset respiratory depression is due to rostral spread of the opioids within the CSF. This affects the respiratory centres in the brain and occurs 6–24 hours after administration (Kanner, 2003). The latter is characterised by an initial increase in sedation score. The respiratory rate may remain normal in spite of significant hypercapnia (elevated arterial CO₂ tension), and hypoxaemia (low arterial oxygen tension) may occur (Rathmell et al, 2005; Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine, 2005).

This highlights the need to measure respiratory rate and sedation score together (Rawal and Alivin, 1996). Although pulse oximetry is widely used to monitor postoperative patients, practitioners should be aware that oxygen saturation levels may be normal despite significant respiratory depression, especially if the patient is receiving supplemental oxygen therapy.

Several factors are associated with an increased risk of respiratory depression.
These include: increased patient age; high-dose spinal opioids; the opioid-naive patient; and concomitant use of sedatives or systemic opioids (Macintyre and Ready, 2001).

Jacobson et al (1989) observed respiratory depression in 80% of patients who received a morphine dose of 1mg, compared with 10% in those who received 0.5mg. The authors concluded that the higher dose had an unacceptable side-effect profile. The highest risk time period for this complication was 5–10 hours after administration.

If a patient suffers respiratory depression, boluses of 50–100mcg of naloxone should be administered intravenously until the patient is rousable. It is important to note that the duration of action of naloxone is shorter than that of morphine; therefore a naloxone infusion may be required.

**Pruritus**

Opioid-induced pruritus (itching) affects predominantly the nose, face and trunk. The precise mechanism of spinal opioid-induced pruritus is unclear but the ability of naloxone to reverse it assumes an opioid receptor mediated central mechanism (Rathmell et al, 2005). Histamine is not thought to be a contributory factor. Anti-histamines have sedative properties and, if administered for opioid-induced pruritus, they may contribute to increased patient sedation which may then be incorrectly attributed to the spinal opioid.

In clinical practice, small incremental doses of IV naloxone (50mcg) are effective for relieving spinal morphine-induced pruritus without affecting analgesia.

**NAUSEA AND VOMITING**

This is the most commonly observed side-effect of opioids. Patient groups most at risk are women, especially those undergoing gynaecological procedures, non-smokers and those with a history of motion sickness (Koivuranta et al, 1997).

Opioid-induced nausea or vomiting occurs as a result of stimulation of the chemoreceptor trigger zone in the medulla. The effect is intensified by vestibular stimulation, that is, any form of movement. There is little evidence of a dose-related effect. Anti-emetics work less well once symptoms have developed. It is more effective to routinely administer anti-emetics for all patients who are uncomfortable and unable to continue according to clinical condition.

If the spinal opioid provides inadequate pain relief and the patient continues to report moderate to severe pain despite receiving the rescue analgesia recommended, then it may be necessary to commence a PCA. This would only be carried out following review by the acute pain service and/or anaesthetist, and initially small incremental morphine doses (for example, cyclazine 50mg tds) to all patients receiving postoperative opioids (Baxendale, 2007).

**Urinary retention**

Urinary retention following the administration of spinal opioids is common but its true frequency is unclear as many patients are routinely catheterised. The mechanisms are multifactorial and include both an alteration in parasympathetic tone and the actions of central analgesia. The latter results in an increased pain threshold causing detrusor muscle relaxation and an increase in bladder capacity (Rathmell et al, 2005). Urinary catheterisation is not necessary for all patients, however it may be required for patients who are uncomfortable and unable to void. This inability to void usually resolves 10–12 hours after opioid administration.

**Rescue analgesia**

Regular pain assessment can facilitate the administration of supplementary analgesia at a predetermined pain score. With regular pain assessment and reassessment, once analgesia has been given, pain scores can be prevented from becoming severe (Bowrey et al, 2005). If analgesia is inadequate following administration of rescue analgesia, then supplementation with parenteral or oral opioids may be considered. Caution should be exercised in giving further strong opioids to ensure increased sedation and respiratory depression are avoided.

**CONCLUSION**

Spinal analgesia plays an important role in the postoperative management of patients undergoing a diverse range of surgical procedures. Patients do not have the physical restrictions of an external infusion device as with epidural analgesia.

Spinal opioid analgesia is safe and effective in many clinical areas including general surgical wards, provided patients are monitored and managed appropriately. Establishing the optimum dose of spinal morphine requires balancing the associated but treatable risks of adverse effects with the benefits of effective analgesia.