



Alamy

AUTHOR

Tarnia Taverner, MSc, RGN, is Yorkshire acute pain coordinator

ABSTRACT

Taverner, T. (2003) A regional pain management audit.

Nursing Times; 99: 8, 34-37.

An audit was carried out in the Northern and Yorkshire region to assess postoperative pain management outcomes. Pain scores were measured in the recovery room at 24 hours and at seven days postoperatively, at rest and on movement. A verbal numerical rating score (VNRS) tool was used. Data was also collected on the modalities of pain management. The results show that a large percentage of patients reported unacceptable levels of pain despite changes in practice and the development of acute pain management teams. Epidural infusion was the most effective modality and intramuscular opioid with non steroidal anti-inflammatory drugs (NSAIDs) and codeine were shown to be more effective than patient-controlled analgesia. Sites with pain management teams did not provide better pain management for postoperative patients.

A regional pain management audit

THE JOINT working party report of the Royal College of Surgeons and the Royal College of Anaesthetists on pain after surgery (1990) recommended that every hospital should have a multidisciplinary acute pain service to improve postoperative pain relief. This recommendation has been supported by the Association of Anaesthetists and the Pain Society (1997), and the Audit Commission (1997).

The Clinical Standards Advisory Group decided to assess the effects of the 1990 joint working party report on acute pain management in the UK, producing its own report, *Services for Patients with Pain*, in 2000. Based on a survey of 250 trusts, the CSAG found that 88 per cent had an acute pain service and 83 per cent had a whole-time equivalent acute pain nurse. However, data on patient outcome was limited to interviews with 117 postoperative patients in 10 sites.

Most of the audit projects on acute pain have concentrated on single centres or on the availability of resources such as the number of consultant sessions and whether there is an acute pain nurse. Although these resources are an essential foundation for improving postoperative pain management there is little data available on the impact they have had in terms of utilisation of newer methods of pain relief or in terms of patient outcomes.

Regardless of where an individual has surgery, they have a right to have their pain managed effectively by health care professionals with specialist training in pain management. The Royal College of Surgeons and the Royal College of Anaesthetists (1990) recommend that all hospitals should have a pain service for effective postoperative pain management. They also recommend that no patient should have more than two episodes of pain with a verbal numerical rating scale (VNRS) score of four or greater, in their postoperative phase.

The provision of acute pain services in the Northern and Yorkshire Region was shown by the Audit Commission's report (1997) to be the lowest in the country (51 per cent). The audit reported in this article is the first to look at the implementation of newer methods of pain relief and the effect on patient outcome in terms of pain relief and patient satisfaction across a wide spectrum of hospitals within a region. Sixteen hospitals were included in the audit, ranging from the large teaching hospitals with 5,500 beds to smaller district general hospitals with fewer than 400 beds.

Study design and methodology

All patients in the Yorkshire region undergoing surgery for a range of procedures over a two-week period were included in the study. At least 40 patients from each site were included in the audit to allow for satisfactory data measurement. To achieve this it meant that in some sites the audit ran for up to four weeks due to small numbers.

A standard proforma was designed to collect data that measured postoperative pain scores in the recovery room, at 24 hours, and at seven days postoperatively, on movement and at rest. Patient satisfaction and pain management modalities were also recorded at these points. Patients were also asked to rate the management of their pain as very poor, poor, average, good or very good.

The recovery room data was collected by a recovery room nurse, 24-hour data was collected by a pain nurse specialist or a nurse responsible for the audit and seven-day data was collected by seeing the patient on the ward or by telephone if the patient had gone home. The data was analysed using an SPSS statistical package.

Population studied

Fourteen sites completed the audit – 552 patients having the following types of surgery were recruited:

- Major abdominal surgery – incision above the umbilicus (34 per cent);
- Total knee replacement (27 per cent);
- Abdominal hysterectomy – via Pfannenstiel incision (16 per cent);
- Mastectomy (10 per cent);
- Abdominal hysterectomy – via midline incision (7 per cent);
- Major abdominal surgery – via incision below the umbilicus (7 per cent).

These procedures were chosen because they are undertaken in most hospitals and can involve a variety of anaesthetic techniques. In the survey 67 per cent of the patients were female and 33 per cent were male.

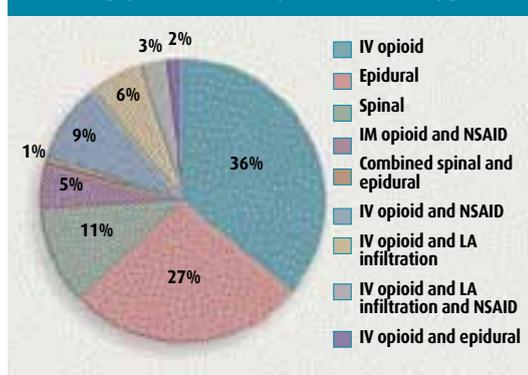
Pain support services

The majority (69 per cent) of the sites had pain management teams, with a clinical nurse specialist and consultant anaesthetist carrying out most of the work. The majority (92 per cent) had consultant session time allotted for acute pain management, but this varied depending on other commitments. Some teams had pharmacy and physiotherapy support.

Two of the hospitals had pain services that were run from the recovery area using a consultant anaesthetist with the support of nurses from the recovery area but without nurse specialist input. Two hospital sites had no provision for pain management and no protocols.

All the hospitals with pain teams and half of those without pain teams provided education, although the way it was provided differed across the sites. Some provided voluntary, ad-hoc study days, while others insisted on staff attending study days on specific topics, such as epidural care, before being allowed to care for patients with these modalities.

FIG 1. PATIENTS RECEIVING MODALITY ACROSS THE REGION IN THE PERIOPERATIVE PERIOD



Pain scores across all sites and modalities

Patients had their pain managed well in the recovery room – 88 per cent recorded a VNRS pain score of 0-4 at rest. At 24-hours postoperatively, patients rated pain management as less effective. Pain scores at rest showed 78 per cent of patients having a VNRS pain score of 0-4; on movement, 40 per cent of patients had a VNRS pain score of 0-4, while 34 per cent had a score of 5-7 and 26 per cent had a score of 8-10. At seven days post-surgery 39 per cent of patients had a pain score on movement of 5-7, while 8 per cent experienced pain scored at 8-10.

There were differences between sites. The site that had the worst pain scores was one of the sites that had no pain management provision. However, the sites that had no pain team, but which provided recovery room support, showed little difference in pain management outcomes compared with sites that had pain management teams.

Perioperative pain modalities

The most commonly used modalities within the perioperative period were intravenous opioid (36 per cent), continuous epidural infusion of local anaesthetic and opioid (27 per cent), spinal local anaesthetic and opioid (11 per cent) and intramuscular (IM) opioid and NSAIDs (5 per cent) (Fig. 1). Some of the modalities used within the perioperative period had similar pain management outcomes, but IM opioid with NSAIDs (Fig. 2) had poorer outcomes.

The most common forms of pain management at 24 hours were continuous epidural infusion (EI) (28 per cent), patient-controlled analgesia (PCA) (26 per cent), PCA and NSAIDs (21 per cent), and IM opioid with NSAIDs and codeine (11 per cent). Only 25 per cent of patients with just PCA had a VNRS pain score of 0-4 at 24 hours postoperatively on movement. The group that had NSAIDs with PCA did slightly better with 34 per cent having a pain score of 0-4.

Continuous EIs were the most successful form of pain management at 24 hours with 58 per cent of patients reporting a VNRS score of 0-4 on movement.

Patients who had major abdominal surgery were most likely to have an epidural (55 per cent). Women having a hysterectomy with Pfannenstiel incision were least

likely to have EI (8 per cent). Women having abdominal hysterectomy were most likely to have PCA (75 per cent), whereas women having mastectomies were least likely to receive PCA (22 per cent).

IM opioid – either with codeine and NSAIDs (11 per cent) or alone (6 per cent) – was the third most commonly used modality. A few sites administered opioids via a subcutaneous cannula using a simple flowchart, allowing the opioid to be given more frequently without the patient having to have the discomfort of an injection.

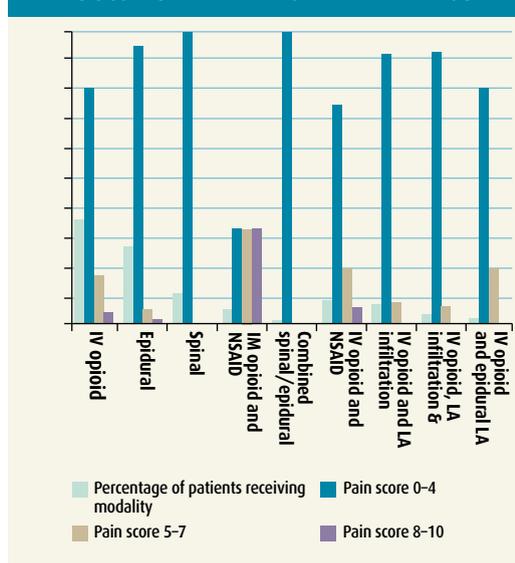
Some 40 per cent of patients who had IM morphine with NSAIDs and codeine reported a satisfactory VNRS pain score of 0-4 at 24 hours on movement. Only 25 per cent of patients receiving IM opioids alone had a VNRS pain score of 0-4 at 24 hours and 40 per cent of this group had a VNRS pain score of 8-10, compared with 16 per cent who received IM opioid, NSAIDs and codeine.

Type of surgery

Patients who had undergone a mastectomy had the best pain management outcomes. Pain in major abdominal surgery with incision above or below the umbilicus was managed better than pain in hysterectomy or total knee replacement. Patients who had abdominal surgery with incision above the umbilicus were more likely to have EI (57 per cent). Patients having EI were far more likely to have satisfactory pain management, 60 per cent of them had a VNRS pain score of 0-4 at 24 hours on movement.

The pain of women having a hysterectomy with Pfannenstiel or midline incision was not managed well. Women having had a Pfannenstiel incision were the worst managed group throughout the region, with only 28 per cent experiencing a VNRS pain score of 0-4 at 24 hours on movement, while 35 per cent had a score of 8-10. Most women had PCA with NSAIDs (41 per cent), 34 per cent had PCA alone, and of the 8 per cent who had EI 43 per cent had a VNRS score 0-4. It was also unusual

FIG 2. PERCENTAGE OF MODALITIES USED WITH VNRS SCORES IN THE PERIOPERATIVE PERIOD



REFERENCES

Association of Anaesthetists of Great Britain and Ireland and The Pain Society (1997) *The Provision of Pain Services*. London: Association of Anaesthetists/The Pain Society.

Audit Commission UK (1997) *Anaesthesia Under Examination: the Efficacy and Effectiveness of Anaesthesia and Pain Relief Services in England and Wales*. London: Audit Commission.

Clinical Standards Advisory Group (2000) *Services for Patients with Pain*. London: The Stationery Office.

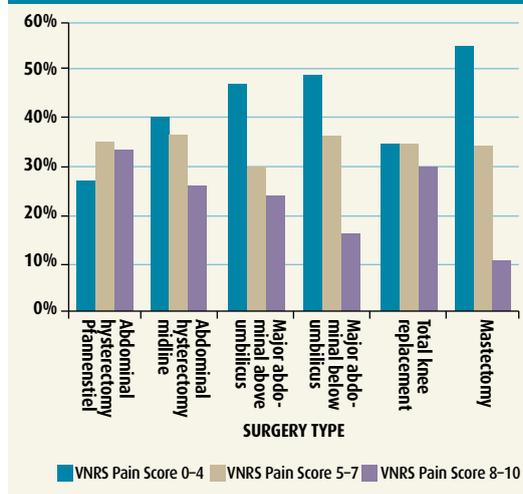
Coleman, S.A., Booker-Milburn, J. (1996) Audit of postoperative pain control. Influence of a dedicated acute pain nurse. *Anaesthesia*; 51: 12, 1093-1096.

Kilbride, M. et al (1992) Epidural Analgesia. *Surgery, Gynaecology and Obstetrics*; 174: 2, 137-140.

Lehman, K.A. (1995) New Developments in PCA Post Operative Analgesia. *Annals of Medicine*; 27, 271-282.

Liu, S.S. et al (1998) Patient-controlled epidural analgesia with bupivacaine and fentanyl on hospital wards: prospective experience with 1030 surgical patients. *Anaesthesiology*; 88, 688-695.

FIG 3. SURGERY AND VNRS PAIN SCORES AT 24 HOURS POSTOPERATIVELY ON MOVEMENT



for women having hysterectomies to have IM opioid, NSAIDs and codeine (9 per cent). There was no significant difference in incidence of modality type and pain scores between midline or Pfannenstiel incisions.

Patients having had total knee replacement also did not have their pain managed well. Most of these patients had PCA and nothing else (33 per cent), with just 25 per cent having a pain score of 0-4 and 35 per cent with a score of 8-10 at 24 hours on movement (Fig. 3). Some 18 per cent of patients had PCA with NSAIDs, with 42 per cent of them having a score of 0-4. Epidural was used for 18 per cent of patients - 46 per cent of this group had pain scores of 0-4. Patients who had only IM opioid were most likely to have high pain scores: 63 per cent of them had a pain score of 8-10.

In comparison, patients who had IM opioid with NSAIDs and codeine were much less likely to get high pain scores. Only 20 per cent had a pain score of 8-10 (Fig. 4).

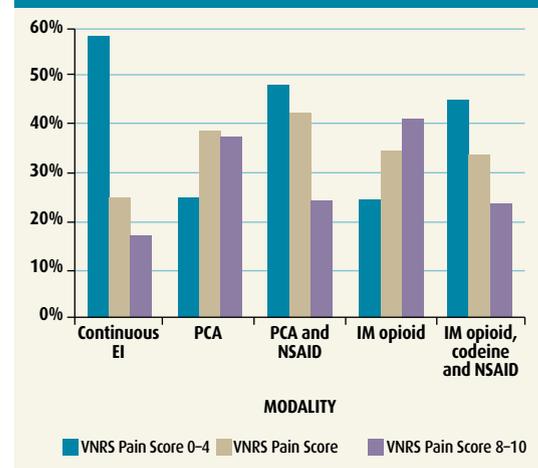
Patient satisfaction

Most patients rated their satisfaction with pain management at 24 hours as good or very good (Fig. 5). Patient satisfaction was even better seven days postoperatively. Although patient satisfaction does not reflect the pain scores, as patients who were satisfied also had high pain scores, the number of dissatisfied patients was higher where pain was managed ineffectively.

Discussion

The audit results show that a large percentage of patients across the region have poor pain management with 60 per cent of them experiencing unacceptable levels of pain 24 hours after surgery. If a patient has a pain score of five and above their pain management has failed. This level of pain control does not meet the requirements of the Audit Commission (1997), which stated that less than 20 per cent of patients should experience severe pain following surgery after 1997, and that this should decrease to less than 5 per cent by 2002.

FIG 4. MODALITY AND PERCENTAGE OF PATIENTS WITH A VNRS PAIN SCORE OF 0-10 AT 24 HOURS POSTOPERATIVELY ON MOVEMENT



Across the region studied the most commonly used modalities are PCA (47 per cent), continuous EI (28 per cent) and IM/subcutaneous opioid (11 per cent). PCA was found to have a high failure rate with 75 per cent of patients having PCA alone reporting a pain score of 5-10. This is a significant finding and one that needs to be addressed as the use of PCA has become widespread because it is thought to be more effective than conventional IM opioid.

Coleman and Booker-Milburn (1996) state that the inadequacies of IM opioid fuelled an expansion in the use of PCA and epidural analgesia after surgery although this is not always accompanied by increased education and specialist supervision of ward staff and patients. More surprisingly, the efficacy of PCA was found to be low.

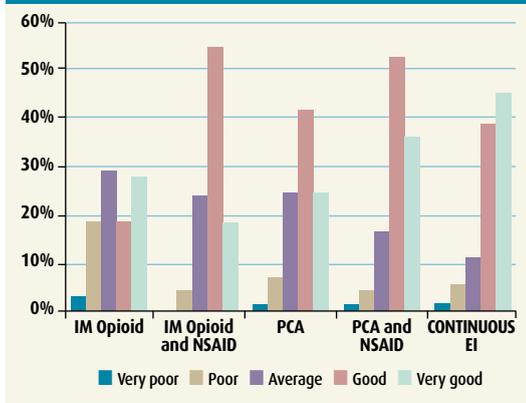
However, patient satisfaction with PCA was good. Less than 10 per cent of patients were dissatisfied with this modality. Other studies have shown that most patients are more satisfied with PCA than with conventional administration of analgesics by a member of staff, although actual pain relief is not necessarily improved (Taylor et al, 1996; Lehman, 1995).

The effective use of PCA requires patient understanding and cooperation (Rowbotham et al, 1989). Notcutt and Morgan (1990) detailed the practicalities of using PCA including: education, equipment, logistics, preoperative preparation, supervision, protocols, monitoring and audit.

In our audit the group most likely to get PCA for pain management were women having hysterectomies; they were also the group with the highest reported failure of pain management.

Other studies have found that 65-77 per cent of patients having major gynaecological surgery and hysterectomies are likely to experience postoperative nausea and vomiting. This may indicate why PCA is failing this group. Tsui et al (1997) found that postoperative nausea and vomiting decreased analgesic efficacy by discouraging the use of PCA and was regarded as distressing as pain. It was concluded that a standard

FIG 5. MODALITY AND PATIENT SATISFACTION AT 24 HOURS POSTOPERATIVELY



monitoring and management protocol with experienced nursing teams and a reliable acute pain service should be mandatory when modern analgesic techniques are used.

Continuous EI had the best outcomes with 58 per cent of patients having a VNRS pain score of 0–4 at 24 hours. Other studies have shown the effectiveness of this technique. Kilbride et al (1992) state that an epidural achieves excellent pain control in more patients with a significantly lower dose of narcotics and significantly fewer pulmonary complications. Epidural analgesia is, therefore, considered the optimal method of postoperative analgesia after extensive abdominal surgery.

One of the most interesting outcomes from the audit is the success in the combined use of IM opioids with NSAIDs and codeine compared with IM opioids alone. The success could be explained in the more frequent use of a flowchart to administer the opioid via subcutaneous cannula, hourly if required. It could also be the use of a group of analgesics creating a synergistic effect. Many sites gave paracetamol to enhance the effectiveness of opioids. Certainly, the use of NSAIDs greatly improved the outcomes of both IM and PCA opioids.

The audit has shown that when IM/subcutaneous opioid is given with codeine and NSAIDs it is more effective than PCA alone. This is in contrast to many studies where PCA has been shown to be more effective. In one study, it was found that 91 per cent of patients experienced only mild pain or were mildly comfortable with PCA technique. It could be hypothesised that when PCA is used for a clinical study, where education and support is provided to the patient, the success rate is much improved.

Most of the sites included in the audit had pain management teams and two ran pain management support from the recovery area. These two sites managed pain better than others with pain management teams. This could be due to having better communication and input within the theatre/recovery environment, or it could be that by having all recovery nurses trained in pain management a more consistently effective service is provided.

The site with the best outcomes had a pain management team and unique to their clinical practice was the

use of a prescription chart for all postoperative patients with analgesics and anti-emetics printed on to it, therefore ensuring that adequate drugs were prescribed.

The failure rate of pain management in sites with pain teams is a concern. The presence of a pain team by no means guarantees an adequate level of service because an appropriate level of nursing and anaesthetic input is also essential for safe and effective care (CSAG, 2000). The CSAG report also suggests that funding arrangements for acute pain teams are inadequate.

Conclusion

The audit results have shown that pain management for postoperative patients is inadequate across the region studied, especially for patients having PCA. It can be concluded that PCA is not effective for postoperative analgesia, although it has fared better where patients received adequate education and staff received appropriate training. Although most sites in this region have pain teams, this does not guarantee effective pain management. Staff at many of the sites feel that they are inadequately funded and also inadequately staffed.

Patients most likely to experience unacceptable levels of pain were women having a hysterectomy. Only a few sites had postoperative nausea and vomiting protocols for this group and many reported that PCA was often discontinued or discouraged by the nursing staff.

Patients having total knee replacements also had a high failure rate; they were also the least likely to get NSAIDs. The use of NSAIDs with PCA and IM opioids was shown to improve pain management outcomes.

The use of epidural was commonplace in the region studied and most sites cared for patients having EI within the ward environment. This audit has shown that continuous EI is more successful than any other modality.

Recommendations

Patient and nurse education must be improved in the use of PCA because of its high failure rate. Postoperative nausea and vomiting needs to be managed better and patients at high risk given effective anti-emetics. It is not a reason to discourage or prevent the administration of opioids.

The use of NSAIDs with all patients should be encouraged, where suitable, especially patients undergoing orthopaedic surgery. The use of continuous EI has been shown to be safe and effective (Liu et al, 1998) and hospitals that are not using this technique or continue nursing these patients in intensive care or high dependency units must review their practices. The use of EI needs to be encouraged and supported by suitably qualified individuals who can provide training and support to the wards.

Effective pain management must be seen as a priority in patient care. Controlling pain is important for both quality and cost reasons, and pain management services need to be funded adequately. A multidisciplinary team approach is required to enhance and encourage continuity with effective postoperative pain management. ■

REFERENCES

- Notcutt, W.G., Morgan R.J. (1990) Introducing patient-controlled analgesia for postoperative pain control into a district general hospital. *Anaesthesia*; 45: 5, 401–406.
- Royal College of Surgeons of England and the Royal College of Anaesthetists (1990) *Report of the Working Party of Pain After Surgery*. London: RCS/RCA.
- Rowbotham, D.J. et al (1989) A disposable device for patient-controlled analgesia with fentanyl. *Anaesthesia*; 44: 11, 922–924.
- Taylor, N.M. et al (1996) Patients' experiences of patient-controlled analgesia. *Anaesthesia*; 51: 6, 525–528.
- Tsui, S.L. et al (1997) Epidural infusion of bupivacaine 0.0625% fentanyl 3.3mcg/ml provides better pain relief than patient-controlled analgesia morphine after gynaecological laparotomy. *Anaesthesia and Intensive Care*; 25: 5, 476–481.

For related articles on this subject and links to relevant websites see www.nursingtimes.net