A small-scale audit was carried out to measure nurses’ adherence to protocol and understanding of the issues involved in epidural analgesia

Competency in managing care in epidural analgesia

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- Implications of insufficient postoperative pain relief
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Author
Andrew Bird is nurse specialist in pain management, Nottingham University Hospitals Trust; Nick Allcock is associate professor, University of Nottingham; Joanne Cooper is head of nursing and midwifery research, Nottingham University Hospitals Trust.

Abstract

Background
Epidural analgesia (EA) is effective in providing postoperative pain relief, but has potential complications. An audit was carried out to measure the knowledge, skills and adherence to protocols of nurses deemed competent to care for patients receiving EA.

Method
This audit assessed the recording of observations, staff practices and knowledge against the trust’s policy for EA care.

Results
All observation charts examined (n=16) were incomplete. Nurses (n=9) scored a mean of 24.4 out of a possible 28 points in the observational assessment. Six (66%) questionnaires were returned. The nurses scored a mean of 75% on the questionnaires.

Conclusion
The results from the audit should be viewed with caution as the amount of data collected was small, but suggest there is a need for changes to the protocol for epidural observations and the associated teaching programme. Further audits should be performed to obtain results that can be more easily generalised.

Postoperative pain
Postoperative pain has been shown to have harmful effects on the respiratory, cardiovascular, musculoskeletal, gastrointestinal, genitourinary and immune systems (Middleton, 2003). It can also have damaging psychological effects and lead to chronic pain conditions, prolonged recovery and delayed discharge from hospital (Mackintosh, 2007).

It is therefore important to monitor postoperative pain and treat it effectively. Effective pain management has become an integral part of healthcare as an ethical, patient-centred and cost-effective practice (MacIntyre et al, 2010).

Epidural analgesia
EA is the delivery of analgesia into the epidural space. Local anaesthetics and opioids can individually provide effective pain relief when delivered into the epidural space, but an enhanced effect has been shown when they are used together (Dahl et al, 1992).

The use of EA has been made easier by the introduction of devices that allow continuous infusion, as well as patient-controlled epidural analgesia (PCEA) systems that allow patients to access bolus doses of pain relief: an anaesthetist inserts a cannula into a patient’s back
analgesia by pushing a button attached to the delivery device. EA provides better pain relief than intravenous analgesia and has been shown to reduce postoperative complications. Complications associated with EA relate mainly to the side-effects of the drugs used or to the epidural catheter (Table 1).

In a large audit involving data from over 700,000 cases, the Royal College of Anaesthetists found that the risk of permanent injury from having an epidural or spinal anaesthesia could be up to 1 in 24,000 (RCoA, 2009). The audit highlighted organisational deficiencies that contributed to delayed diagnosis and management of problems, leading to avoidable harm. Contributing factors included inadequate monitoring and a poor understanding of abnormal findings by nurses and doctors.

Assessment, knowledge and training
The RCoA guidelines on best practice in the management of EA recommend that all nurses should be aware of its potentially life-threatening complications (RCoA, 2010). In a study of nurses’ knowledge of EA (Bird et al, 2009), participants (n=408) demonstrated a good knowledge of EA (Bird et al, 2009), participants (n=408) demonstrated a good knowledge of nursing management and assessment of sensory and motor block (the effect of local anaesthetic on the sensory and motor nerves), but a poor understanding of pharmacology and complications.

A competency document drawn up by the acute pain service at Nottingham University Hospitals Trust requires nurses to understand the importance of adequate observation and monitoring of patients receiving EA. Nurses must be able to list, explain the significance of, perform and document each observation required, in line with RCoA guidelines (RCoA, 2010). These recommend that observations should include:

» Respiratory rate;
» Heart rate and blood pressure;
» Temperature;
» Pain and sedation scores;
» Degree of sensory and motor block.

The frequency of observations should be based on clinical judgement and tools such as early warning score systems, but a greater frequency of observation is advised for the first 12 hours of infusion as well as after bolus doses and rate changes. Understanding the significance of abnormal parameters and acting promptly when necessary are essential, as failure to do so could have serious consequences.

Methods
Audit tools were based on the trust’s competency and protocol documents, using a standard criteria and audit development tool devised by the Centre for Evidence-based Practice South Australia (2009). We collected data on documentation, patient assessment and nursing knowledge. The trust protocol requires the following:

» Hourly monitoring of respiratory rate, oxygen saturation, heart rate, blood pressure, pain, sedation, nausea and vomiting and pump functions (including rate, volume infused and number of PCEA boluses demanded and accessed) for at least the first 24 hours of EA; if the patient is stable after this period, two-hourly monitoring of respiratory rate and four-hourly monitoring of all other observations until the infusion is stopped.

» Four-hourly monitoring of the sensory and motor block while the infusion is in progress.

A check of the epidural insertion site at least once per day and continued monitoring for signs of motor block for 24 hours after the epidural catheter has been removed.

To enhance the face validity of the audit tools, expert review was gained from members of the acute pain service to ensure the right issues were addressed.

Formal ethical approval was not required, but approval was gained to conduct the audit, in accordance with trust policy. Permission to use patients’ observation charts was gained from the Caldicott guardian, while ward managers gave verbal permission to conduct the audit on their wards.

Nurses (n=9) working on the wards were asked to take part in the assessment and knowledge parts of the audit. An information sheet was given to each nurse and written consent was gained before the nurse was observed conducting a full assessment of a patient with EA. Verbal consent was obtained from each patient.

Assessment – nurse observation
Nine nurses who had received EA training while employed by the trust were asked to take part in the next two sessions of the audit. They were rated on 14 aspects of patient assessment during the observed period. As each observation was recorded, it was scored as having been done completely (2 points) or partially (1 point); if an observation was not performed during this period it was rated as not completed (0 points).

Knowledge – questionnaire
The nurses were asked to independently and anonymously complete a questionnaire based on the trust’s protocol and the clinical importance of each observation without using reference materials. The knowledge section of the questionnaire was marked by three members of the acute pain service, with two points given for a complete answer, one point for a partially correct answer and no points if answered incorrectly or not answered. The average score (mode) was taken for each answer.
TABLE 1. COMPLICATIONS OF EPIDURAL ANALGESIA

<table>
<thead>
<tr>
<th>Drug side-effects</th>
<th>Catheter-related complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedation</td>
<td>Dural puncture on insertion</td>
</tr>
<tr>
<td>Respiratory depression</td>
<td>Paraeesthesia</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Neurological damage</td>
</tr>
<tr>
<td>Nausea and vomiting</td>
<td>Epidural haematoma</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>Epidural abscess</td>
</tr>
<tr>
<td>Pruritus</td>
<td></td>
</tr>
<tr>
<td>Motor blockade</td>
<td></td>
</tr>
</tbody>
</table>

Results

Documentation

All 16 observation charts examined (100%) had no documented evidence of hourly observations within the first 24 hours of postoperative nursing care. All 16 also had no recorded assessment of two-hourly respiratory rate after the initial 24-hour period or assessment of motor block after the epidural catheter had been removed. Four (25%) showed evidence that nearly all other observations had been recorded as required.

The only observation recorded 100% of the time, as required by the protocol, was a check of the insertion site; all others were documented in only 20–32% of cases.

The only complication noted on a chart was that one epidural catheter had been accidentally pulled out within the first 24 hours.

Assessment – observation

The mean score was 24.4 (standard deviation = 2.2) out of a possible total 28 (87.3%). Table 1 gives the scores for each nurse.

Knowledge

The response rate was 66% (n=6). The frequency of nine out of 12 observations after the first 24 hours was correctly indicated by all nurses. The nurses demonstrated good knowledge (scoring at least 75%) of the reasons for the regular monitoring of pain, nausea, sensory block and the insertion site but no nurse gave complete reasons for monitoring oxygen saturations, heart rate or blood pressure. Only one nurse identified the potential risk of epidural abscess or haematoma as a reason for monitoring motor function.

Discussion

This audit identified a general lack of compliance with the trust’s EA protocol, even though the participating nurses were able to show good observational skills and knowledge of the required frequency and significance of observations.

Documentation

Data from the observation charts, although limited by the sample size, tends to show a lack of compliance with the trust’s EA protocol. It could be argued that the protocol requires excessive monitoring. The RCoA (2010) recommends a 12-hour period of close monitoring following the insertion of an epidural and after an increase in rate or a bolus dose of epidural drugs; at other times, monitoring should be performed as appropriate for general clinical considerations.

Amending the existing protocol would halve the time required for hourly monitoring and could improve compliance while still complying with RCoA recommendations.

Assessment

The observed assessments indicate that nurses generally perform assessments well, although being observed may have influenced their behaviour (Caldwell, 2005). They performed the regular respiratory and cardiovascular monitoring consistently well, as well as the sensory block and site observation. However, the nausea score was carried out less well and the assessment of motor block poorly conducted. This is a concern, as delayed recognition and treatment of abscess or haematoma can lead to permanent harm (RCoA, 2009).

Failure to check the line also has major implications. Not detecting a disconnected line can lead to inadequate analgesia and increase the risk of infection in the epidural space, especially if the disconnection occurs on the patient side of the filter.

Knowledge

Nurses were aware of the required frequency of monitoring for almost all the observations both during and after the initial 24-hour period.

They understood the significance of the observations, but did not identify which component of the drug combination was the cause of the effects. This finding is similar to the results of Bird et al (2009) who found that nurses performed poorly in questions relating to the pharmacology of EA. The nurses seemed to have a level of knowledge to care for patients with EA safely, as they were able to identify possible problems that may arise. Failure to identify the reason behind such complications may, however, delay treatment.

Implications for future practice

Due to the small sample in this audit, any recommendations for future practice must be made with caution; however, the findings have informed the development of staff knowledge and application of guidance on EA at the trust. Further larger-scale audit and research is recommended into:

» Assessing whether a shorter period of close monitoring in line with RCoA recommendations may increase adherence to a new trust protocol without increasing the incidence of complications and near misses;

» Examining the impact of supplementary teaching or posters highlighting the risks of serious complications such as epidural haematoma or abscess in addressing any deficit in knowledge and skills relating to the assessment of motor block.

References


Collegian; (2010) Examining the impact of supplementary teaching or posters highlighting the risks of serious complications such as epidural haematoma or abscess in addressing any deficit in knowledge and skills relating to the assessment of motor block.