

## **Abstract of Thesis**

Prospective observational study of postoperative epidural analgesia for major abdominal surgery.

### **Background**

This prospective observational study focuses on the quality of epidural analgesia, a technique used for the relief of pain after major surgery. Epidural analgesia has become the 'gold standard' technique for the management of postoperative pain, particularly in the 'high risk' patient undergoing major abdominal surgery. Nevertheless, the evidence base for the relatively rapid development in the use of epidural analgesia from the early 1990s to 2008 is not robust (Low et al. 2008). Up to 30% of the population of patients with epidurals still experience severe pain in clinical practice (McLeod et al. 2006). When epidurals work there can be potentially harmful side effects. If this is the reality in most clinical settings, then the widespread use of epidural analgesia must be questioned. First, patients are consenting to an analgesic technique that cannot be delivered effectively to the majority of patients. Second, there may be a shift in the risk benefit scales as the technique is not without side effects and can have rare but catastrophic complications. Third, evidence is mounting that severe pain after surgery is associated with an increased risk of chronic pain (McCrae 2008). Research focusing on epidural analgesia for pain relief after major surgery is an important topic because there is still no strong evidence in favour of a procedure that could potentially harm patients.

### **Aims**

The aims of the study were to describe the incidence of pain, hypotension and other epidural-related side effects after major abdominal surgery, to identify factors associated with effective analgesia and postoperative hypotension on the first day after surgery.

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The objectives of the study were;

- To collect pain scores, side effects and critical incidents for all patients consenting to an epidural for postoperative pain relief over a period of 18 months
- To identify the characteristics associated with the quality of postoperative epidural analgesia and the incidence of hypotension using both classical descriptive and correlational statistics and Statistical Process Control (SPC) methods
- To compare the extent to which the results achieved in a Randomized Controlled Trial (conducted by the author prior to this study) mirror those in everyday practice
- To identify the important measurements of acute pain assessment in preparation for computerized data collection.

## **Methods**

Data were collected prospectively from 480 consecutive general surgical patients between 1 January 2006 and 30 June 2007 in a large District General Hospital. There were strict definitions of variables to ensure uniformity, which are described in detail in the study. Both classical statistics and statistical process control methods, a unique feature of the study, were employed to analyse and learn from the data.

## **Results**

The key findings from the study were that;

- Fifty-six percent of patients were hypotensive on day 1. A strong correlation was found between effective epidurals and hypotension despite optimal fluid management. Low pain scores were found to be a predictor for postoperative hypotension.
- Severe pain (over 6 on an 11-point scale), was associated with emergency patients, male gender, the absence of hypotension and an epidural that did not continue until planned removal.

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- Significantly lower mean pain scores were found in patients who were 70 years of age and over compared to patients below the age of 70.
- Patients experienced higher pain scores when the epidural failed before discharge to the ward than did patients discharged with an epidural in situ. This difference was statistically and clinically significant.
- Male gender was associated with increased pain across all age groups.
- Many failures occurred due to technical problems.
- There was no correlation between chronic pain before surgery and the level of postoperative pain.

## **Discussion**

In the UK and internationally, the anaesthetic and pain service community are becoming more divided in their views about the effectiveness and safety profile of epidural analgesia. Few trials to date match the population who routinely undergo major abdominal surgery. This study contributes to the epidural versus non-epidural debate by describing the population and identifying factors associated with both the success and failure of the technique in everyday clinical practice. It is important for nursing professionals to know the true risk/benefit profile of post-operative epidural analgesia as it is ward nursing staff who are primarily responsible for monitoring the effectiveness of the technique, the patients' safety, and intervening to improve poor quality pain control. The Audit Commission (1997) has proposed a standard whereby less than 5% of patients should suffer severe pain following surgery. This may prove to be an unrealistic goal, as the result of this pragmatic study highlights the complexity of delivering effective analgesia to every patient. In addition, the application of Statistical Process Control methods has been demonstrated and shown to offer great potential to learn more about both the process of change and outcomes in an Acute Pain Service.

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### **Contribution to nursing scholarship and health care practice**

Primary nursing research focusing on, and challenging, the care of patients nursed with an epidural is scant. I was one of the first to publish the problem of hypotension related to epidural analgesia for major abdominal surgery. Managing this problem could have major resource implications. This study demonstrates a unique approach to study design and analysis, with the development of new insight into epidurals as a result of interdisciplinary work and patient follow up beyond the first hours after surgery.

Based on the study results, the important measurements of an optimum acute pain assessment have been identified. I have recognized the potential advantages of a pool of high quality data to provide national indicators of quality and safety, and thus have identified the need for a national minimum dataset to inform this process. I have recently brought together a working group of anaesthetists and nurses from The UK to define the minimum data set and, with the support of a software company, establish ongoing data collection nationally. Over the long term I hope to generate useful data on changing trends within our speciality.

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## References

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