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Myles, Paul S.; Power, Ian; Jamrozik, Konrad
[Epidural block and outcome after major surgery](#) Medical Journal of Australia, 2002;
177(10):536-537

This article is available from the Medical Journal of Australia at:
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Epidural block and outcome after major surgery

Patients at increased risk of postoperative respiratory complications may benefit

PATIENTS UNDERGOING SURGERY need good advice not only about whether a particular elective procedure is truly necessary and likely to be of benefit, but also about the nature and chances of an adverse outcome from the surgery itself. Those with heart failure, coronary artery disease, diabetes or emphysema are more likely to suffer serious complications or death after major surgery. Epidural anaesthesia and analgesia may be a preferable technique in such patients,¹ as epidural block can attenuate the neurohumoral stress response to surgery,² potentially improving postoperative cardiorespiratory function and reducing complications.

Many small randomised controlled trials (RCTs) have supported this conjecture, but, because most serious complications after anaesthesia and surgery are rare, none has had sufficient power to demonstrate whether epidural block significantly improves postoperative outcome. A solution to this problem is to combine the results of all available trials in a meta-analysis. Applying this approach to data from 141 RCTs involving 9559 patients, Rodgers et al showed that the use of epidural or spinal block (with or without general anaesthesia) resulted in a significant 30% reduction in mortality after surgery.³ Outcomes causing major morbidity (major morbidity endpoints) such as thromboembolism and pneumonia were also reduced. Another recent systematic review found that epidural block reduces postoperative myocardial infarction.⁴ Although these findings are supportive, they were based exclusively on small RCTs, and meta-analyses sometimes give conflicting results when compared with large RCTs.⁵

In 1984, Yusuf et al explained how large, simple randomised trials can reliably detect moderate effects on important but uncommon outcomes such as death or major morbidity after surgery.⁶ Two of us are part of an Australian group that has recently published the results of a large

multicentre RCT of epidural block in 888 high-risk patients undergoing major abdominal surgery (the MASTER trial).⁷ Patients were randomly allocated to receive general anaesthesia with or without epidural block. The epidural block was established before the commencement of surgery (epidural anaesthesia) and epidural analgesia was continued for three days after surgery. All other care was left to the discretion of the anaesthetist and surgical team: most patients were managed in general surgical wards after surgery, although some required high-dependency or intensive care. Thus, our trial was a test of effectiveness in routine practice and its results can be generalised.

There was no significant difference in mortality at 30 days or in overall morbidity — 57% of epidural and 61% of control group patients had at least one morbidity endpoint (sepsis, respiratory failure, myocardial infarction, heart failure, renal failure, gastrointestinal [bleeding or need for parenteral nutrition], hepatitis, or haematological [anaemia, leukopenia, or thrombocytopenia]) or died ($P=0.30$). Mortality at 30 days was low in both groups (epidural, 5.1%; control, 4.3%). Of the eight morbidity endpoints studied, only one, respiratory failure, occurred less frequently in patients managed with epidural block (epidural, 23%; control, 30%; $P=0.03$). Another large RCT published recently showed similar results.⁸ Thus, there is no evidence that epidural block improves outcome in most patients undergoing major abdominal surgery with general anaesthesia, other than for respiratory complications.

Nevertheless, in the MASTER trial, pain scores over the first three days after surgery were significantly lower in the epidural group. This difference occurred despite most participants in the control group receiving multimodal analgesia.¹ This demonstrates some benefit from epidural block: a reduction in pain may assist deep breathing and coughing

after surgery, and this may help prevent atelectasis and pneumonia. The MASTER trial, and other recent data,^{3,8} provide some evidence to support this conjecture.

What are the risks of epidural block? One should take into account the risk of an epidural haematoma when an epidural or spinal needle is placed, particularly in a patient receiving anticoagulation therapy (eg, perioperative thromboprophylaxis). The risk of epidural haematoma or abscess is very low, with estimates varying widely from about 1 : 1700 to 1 : 200 000.^{9,10} Concern regarding damage to the spinal cord (leading to paraplegia) or nerves must be weighed up against the benefits of improved postoperative analgesia.

Evidence-based practice is dependent on good quality research, and the best evidence comes from large trials.⁶ The MASTER trial provides reliable information for doctors and their patients on which to base their decisions regarding the best methods of anaesthesia and analgesia after surgery. Epidural block seems to provide additional benefit for patients at increased risk of postoperative respiratory complications. When considering use of epidural block, doctors and patients also need to weigh up the benefits of improved pain relief against the (rare) risk of paraplegia and other nerve injury. Our experience has been that some patients will choose postoperative epidural analgesia after being given this information.

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