Should thoracic epidurals be routinely sited in patients having cardiac surgery?

Placement of thoracic epidurals in patients undergoing cardiac surgery is controversial. Intraoperatively, activation of cardiac sympathetic nerve fibres causes coronary artery vasoconstriction, predisposing to peri- and postoperative myocardial ischaemia. Cardiopulmonary bypass increases the release of stress hormones which persist into the postoperative period. A thoracic epidural is effectively a thoracic 'cardiac sympathectomy', blocking the cardiac sympathetic nerve fibres. Intravenous opioids (the current mainstay in cardiac recovery) are unable to attenuate the stress response and produce analgesia at this precision without causing non-selective side effects like sedation and respiratory depression.

Advantages of thoracic epidurals

Benefits of thoracic epidural insertion in cardiac surgery include a reduction in mortality, pulmonary complications and arrhythmias. Other benefits include lower postoperative pain scores, opioid consumption, faster tracheal extubation and shorter hospital stays.

Landoni et al (2015) conducted a systematic review that examined 66 trials and 6383 patients, and noted a reduction in mortality (number needed to treat = 70) in the thoracic epidural group while a Cochrane review (Svirecevic et al, 2013) which examined 31 publications and included 3047 patients noted statistically significant reductions in the risk of arrhythmias and pulmonary complications in the thoracic epidural group.

Pastor et al (2003) carried out an observational study of 714 coronary artery bypass graft patients in whom high thoracic (T1–T3) epidurals were sited. None of the patients required parenteral opioids and impressively, 75% of the patients were extubated in the operating theatre.

A retrospective study (Porizka et al, 2016) looking at 288 patients noted that those who had thoracic epidurals experienced a shorter time to extubation, a briefer hospital stay, and reduced pain score and morphine consumption 24 hours post-surgery.

A thoracic epidural can produce intense anaesthesia and analgesia. Awake on and off pump cardiac surgery facilitated by a well-placed thoracic epidural has been described. Patient experience and pain relief are also important considerations. The incidence of chronic pain post-sternotomy has been quoted as between 17 and 56% (Kamalipour et al, 2014). By blocking afferent nociceptive input and thus reducing central sensitization, a thoracic epidural could theoretically reduce chronic post-surgical pain, although there is little clinical evidence to support this.

Disadvantages of thoracic epidurals

Large doses of heparin are injected soon after epidural placement. This is a potential risk factor for an epidural haematoma and a commonly cited reason for not performing a thoracic epidural in these patients. However, no epidural haematomas were identified in Pastor et al (2003), Svirecevic et al (2013) or a systematic review by Landoni et al (2015). In an international survey, Landoni et al (2015) identified a mere 25 epidural haematomas out of an estimated 88 820 epidurals, which produced an estimated risk of 1:3552. Theoretically with a number needed to treat of 70 for mortality reduction, approximately 50 deaths could be prevented for every iatrogenic epidural haematoma. Epidurals are also commonly inserted in patients undergoing vascular surgery, who also frequently receive intraoperative and postoperative heparin.

Anaesthetists may not be comfortable siting an epidural in cardiac patients. The majority of anaesthetists are adept at inserting lumbar epidurals, but thoracic epidurals require more skill. The steep angles of the thoracic spinous processes (necessitating the unfamiliar paramedian technique in some cases), and the more elderly cardiac surgery patients with degenerative spines compound the technical difficulties.

Psychological and human factors are also at play. The additional time required to site a potentially challenging epidural on an already ambitious theatre list may lead to further reluctance to carry out this procedure. As thoracic epidurals are not commonly used for cardiac surgery in the UK, an anaesthetist attempting to place one might encounter resistance from colleagues.

Conclusions

With the low incidence of epidural haematomas and a reduction in mortality, cardiac and pulmonary complications among other benefits, thoracic epidurals should be strongly considered in most patients undergoing cardiac surgery. **BJHM**

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