Regional anaesthesia for caesarean section: a choice of three techniques

Over the last 20 years, there has been a large increase in the proportion of caesarean sections (Brown and Russell, 1995) which are performed under regional rather than general anaesthesia. A bilateral sensory block from the T4 dermatome (nipple level) to the sacral nerve roots (perineum) is necessary.

Practically, there are three techniques available for regional anaesthesia for caesarean section, although direct infiltration with local anaesthetic is described. These are epidural, spinal or combined spinal-epidural anaesthesia.

Epidural anaesthesia

Epidural anaesthesia is used commonly when an epidural catheter for labour analgesia is in place. A simple epidural top-up can then be used to convert an analgesic block into a block for caesarean section. Compared with spinal anaesthesia, epidural anaesthesia is slower in onset (Helbo-Hansen et al, 1988).

An epidural block can be also be patchy with missed segments, particularly if analgesia in labour has not been optimal. However, it provides greater cardiovascular stability than spinal anaesthesia. This has favoured its use when there is a medical indication such as pre-existing cardiac disease, when a carefully controlled incremental epidural minimizes the haemodynamic changes associated with spinal anaesthesia.

Spinal anaesthesia

Spinal anaesthesia is popular because it is simple to perform, produces a reliable block and has a rapid onset time (Helbo-Hansen et al, 1988) compared to epidural anaesthesia. However, it produces profound sympathetic blockade and thus is associated with a greater incidence of hypotension compared with epidural anaesthesia, particularly in the presence of aorto-caval compression.

Spinal anaesthesia is a single-shot technique and thus is unsuitable if surgery is likely to be prolonged. As the dura is deliberately punctured, there is a risk of infection and post-dural puncture headache. However, with small needles and atraumatic pencil point tips, the risk of headache is less than 1% (Hopkinson et al, 1997).

Combined spinal-epidural anaesthesia

The combined spinal-epidural technique was designed to maximize the benefits of spinal and epidural anaesthesia while minimizing their disadvantages. Spinal anaesthesia produces reliable anaesthesia for caesarean section for about 90 minutes. For routine surgery this may be adequate, but if surgery is prolonged (e.g. a repeat caesarean or caesarean with tubal ligation) it is not. In this situation, the epidural catheter can be used to prolong the spinal block.

A combined spinal-epidural also provides greater cardiovascular stability compared with spinal anaesthesia. Increasing the intrathecal dose of bupivacaine may increase the reliability of the final block but at the expense of an increased incidence of hypotension. The sequential block, where a smaller initial spinal dose is given first and then supplemented by injection into the epidural space, may reduce the incidence and severity of hypotension (Rawal et al, 1988). The epidural catheter can also be used to provide effective postoperative analgesia without the side effects of systemic analgesics.

The combined spinal-epidural is technically more challenging than either spinal or epidural anaesthesia. If the position of the epidural Tuohy needle is suboptimal, it may not be possible to puncture the dura with the spinal needle, and repeated attempts at dural puncture with the spinal needle increase the risk of post-dural puncture headache exponentially. If the combined spinal-epidural is inserted in the sitting position, the time taken to insert, flush and secure the epidural catheter may result in a low block (Rawal et al, 1988) from the heavy bupivacaine given intra-thecally. Randalls et al (1991) found that if the lateral position was used, however, the spinal component was satisfactory in all cases.

Conclusions

Regional anaesthesia should be the technique chosen for caesarean section unless there are contraindications. Spinal and epidural anaesthesia are the commonest techniques used. Despite some technical difficulties, the combined spinal-epidural is useful because it increases the reliability of the epidural and improves the flexibility of the spinal anaesthesia. BJHM

Dr J Campbell *is Specialist Registrar in Anaesthetics, Watford General Hospital, Watford WD18 0HB and* **Dr P Sultan** *is Specialist Registrar in Anaesthetics, University College London Hospital, London*

Correspondence to: Dr J Campbell

Brown GW, Russell IF (1995) A survey of anaesthesia for Caesarean section. *Int J Obstet Anesth* **4**(4): 214–18

Helbo-Hansen S, Bang U, Garcia RS, Olesen AS, Kjeldsen L (1988) Subarachnoid versus epidural bupivacaine 0.5% for Caesarean section. *Acta Anaesthesiol Scand* **32**(6): 473–6

Hopkinson JM, Samaan AK, Russell IF, Birks RJS, Patrick MR (1997) A comparative multicentre trial of spinal needles for Caesarean section. *Anaesthesia* **52**(10): 1005–11

Randalls B, Broadway JW, Browne DA, Morgan BM (1991) Comparison of four subarachnoid solutions in a needle-through-needle technique for elective Caesarean section. *Br J Anaesth* **66**(3): 314–18

Rawal N, Schollin J, Wesstrom G (1988) Epidural versus combined spinal epidural block for Caesarean section. *Acta Anaesthesiol Scand* **32**(1): 61–6

Anaesthetic and critical care dilemmas are coordinated by Dr Pervez Sultan and Dr Kate Adams, Specialist Registrars in Anaesthetics, University College Hospital London

Ideas for future dilemmas can be sent to Rebecca Linssen bjhm@markallengroup.com