Regional anaesthesia: awake or asleep?

Regional anaesthesia encompasses central neuraxial and peripheral nerve blockade. These techniques all consist of introducing local anaesthetic to regions around nerves for the purposes of surgical anaesthesia and/or analgesia.

Awake or asleep?

Performance of regional anaesthesia involves percutaneous needle insertion under local anaesthesia, which may be unpleasant for the awake patient. Historically these procedures were performed following induction of general anaesthesia to minimize distress and discomfort to the patient, but there are concerns as to whether this is associated with an increased risk of complications.

There are many case reports in the literature of severe permanent nerve damage following interscalene block, thoracic epidural and lumbar epidural anaesthesia performed after induction of general anaesthesia (Bromage and Benumof, 1998). However, there is still a risk of permanent nerve injury when regional anaesthesia is performed in awake patients (Cook et al, 2009). When medical defence organizations in the UK were surveyed they were unable to find cases of neurological injury where performing the block after general anaesthesia was the sole risk factor (Fischer, 1998). Nevertheless, such case reports have prompted discussion of the perceived safety of performing such blocks following general anaesthesia (Fischer, 1998).

Surveys of practice of UK anaesthetists have shown that attitudes have changed over the last 10 years. In 2001 only 44% of anaesthetists performed regional anaesthesia before general anaesthesia, which had increased to 85% in 2007 (Kadry et al, 2001; Feely et al, 2008). In particular, central neuraxial and interscalene blocks were most frequently performed on awake patients because of the need to detect paraesthesia and increased concerns of central neurological damage with these blocks (Feely et al, 2008). The evidence to support this change in practice is lacking, with case reports and editorials providing the majority of it. The Third National Audit Project of over 700 000 cases of central neuroaxial blockade found the incidence of permanent injury to be 4.2 per 100 000 and incidence of death to be 1.8 per 100 000. Performing the block after induction of anaesthesia was not a risk factor for increased complications (Cook et al, 2009).

Dr James Hanison *is ST3 in Anaesthesia and* **Dr Alan Ashworth** *is Specialist Registrar in Anaesthesia in the Department of Anaesthesia, University Hospital of South Manchester, Wythenshawe Hospital, Manchester M23 9LT*

Correspondence to: Dr J Hanison

Paediatric regional anaesthesia

Regional techniques in paediatric anaesthesia are challenging because children are unlikely to cooperate. As a result, nearly all regional anaesthesia in paediatrics is performed after the induction of general anaesthesia. This presents a large patient group where data have been collected regarding the safety of regional techniques in anaesthetized patients.

A French audit of 24 409 cases where regional anaesthesia was performed (Giaufré et al, 1996) found that although it remained common practice to perform regional blocks in children after induction of general anaesthesia, complication rates were low (0.001%), with no cases of neurological injury or death reported. An audit of 10 633 paediatric epidurals in the UK and Ireland (Llewellyn and Moriarty, 2007) also reported low complication rates (0.005%) with only one case of persistent neurological injury reported and no deaths. The Third National Audit Project included 21 500 cases of central neuraxial block in children (Cook et al, 2009) and found no reports of permanent neurological injury or death.

Ultrasound-guided regional anaesthesia

A systematic review found that ultrasound-guided regional anaesthesia leads to improved success rate, reduced time to perform block, reduced block onset time and increased block duration. It also reduced the risk of inadvertent vascular puncture, but there were not sufficient patient numbers to comment on rarer complications such as nerve injury (Abrahams et al, 2009). The National Institute for Health and Clinical Excellence (2009) recommends that ultrasound-guided regional anaesthesia is efficacious and safe.

Conclusions

Whether performed in the awake or asleep patient, regional anaesthesia carries a small risk of causing temporary and permanent nerve injury. There is still no conclusive evidence that performing these blocks on patients before general anaesthesia is safer. Indeed, the data from paediatric practice show lower complication rates than adult practice. The commonest opinion among anaesthetists surveyed is that it is safer to perform neuraxial blocks and interscalene blocks awake, and this is reflected by practice but not supported by evidence. BJHM

Abrahams MS, Aziz MF, Fu RF, Horn JL (2009) Ultrasound guidance compared with electrical neurostimulation for peripheral nerve block: a systematic review and meta-analysis of randomized controlled trials. *Br J Anaesth* **102**(3): 408–17

Bromage PR, Benumof JL (1998) Paraplegia following intracord injection during attempted epidural anesthesia under general anesthesia. *Reg Anesth Pain Med* **23**(1): 104-7

Cook TM, Counsell D, Wildsmith JA (2009) Royal College of Anaesthetists Third National Audit Project. Major complications of central neuraxial block: report on the Third National Audit Project of the Royal College of Anaesthetists. *Br J Anaesth* **102**(2): 179–90

Feely NM, Popat MT, Rutter SV (2008) Regional anaesthesia for limb surgery: a review of anaesthetists' beliefs and practice in the Oxford region. *Anaesthesia* **63**(6): 621–5

Fischer HB (1998) Regional anaesthesia--before or after general anaesthesia? *Anaesthesia* **53**(8): 727–9

Giaufré E, Dalens B, Gombert A (1996) Epidemiology and morbidity of regional anesthesia in children: a one-year prospective survey of the French-Language Society of Pediatric Anesthesiologists. *Anesth Analg* **83**(5): 904–12

Kadry MA, Rutter SV, Popat MT (2001) Regional anaesthesia for limb surgery--before or after general anaesthesia. A survey of anaesthetists in the Oxford region. *Anaesthesia* **56**(5): 450–3

Llewellyn N, Moriarty A (2007) The national pediatric epidural audit. *Paediatr Anaesth* **17**(6): 520–33

National Institute for Health and Clinical Excellence (2009) *Ultrasound-guided regional nerve block: guidance.* IPG285. National Institute for Health and Clinical Excellence, London

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