Should 22G spinal needles for accessing the subarachnoid space be banned?

The 22 gauge (22G) spinal needle has been used extensively for both diagnostic lumbar puncture and administration of spinal anaesthesia. A significant complication of these procedures is a post-dural puncture headache (PDPH). Other factors influencing the choice of needle size are ease of operator use, failure rate and CSF flow rates.

22G needles should be banned

The larger the dural puncture created, the greater the CSF leak, and the greater the risk of PDPH (*Table 1*).

Over a third of patients will have a PDPH after using a 22G Quincke spinal needle. PDPH can be very distressing for patients and has the potential for significant morbidity with case reports of deaths in the literature. PDPH has been described as a severe 'searing headache spreading like hot metal' (Turnbull and Shepherd, 2003). The common distribution of pain is over the frontal and occipital areas, radiating to the neck and shoulders. It is exacerbated by head movement, standing or straining, and is relieved by lying down. Other symptoms associated with PDPH include nausea, vomiting, hearing loss, tinnitus, vertigo, dizziness, paraesthesia and lower limb pain. Cranial nerve palsies and even cortical blindness are reported. Neurological symptoms may precede the onset of seizures as well as intracranial subdural haematomas, cerebral herniation and death.

Table 1. Relationship between needle size and incidence of PDPH

Needle tip	Needle gauge	Incidence of PDPH (%)
Quincke	22	36
Quincke	27	1.5–5.6
Whitacre	22	0.63–4
Whitacre	25	0–14.5
Whitacre	27	0
Tuohy	16	70

PDPH = post-dural puncture headache. After Turnbull and Shepherd (2003)

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Small diameter needles have been considered impractical for diagnostic lumbar punctures because of the relatively slow flow of CSF. However, a study conducted by Carson and Serpell (1996) using 20G and 22G Quincke and atraumatic needles concluded that diagnostic lumbar punctures can be easily and accurately performed using a large atraumatic needle, potentially considerably reducing post lumbar puncture headache and related neurological sequelae.

22G needles should be kept

Table 1 shows that the incidence of PDPH is as low as 0.63% using a 22G Whitacre needle. The problem appears to be with the needle tip design rather than the gauge.

Sears et al (1994) compared the frequency of PDPH when using the 24G and the larger 22G Sprotte needles in a prospective randomized study in four hospitals using 375 obstetric patients. The incidence of PDPH was similar in both groups, so the authors concluded that the 22G Sprotte needle can be used in obstetric patients without increasing the frequency of PDPH. However, this study did not compare 22G needles with 25G or 27G.

It is thought that smaller needles are associated with a higher failure rate. The narrower the needle the more flexible it is, and even though introducers are used to facilitate passage of these flexible needles, some people find them quite cumbersome.

Lynch et al (1992) compared the use of 22G and 29G Whitacre needles in orthopaedic patients under 40 years old, and found a significantly higher failure rate with 29G needles: 8.5% *vs* 2% with 22G ($P<0.05$). The difference may be higher in more elderly patients where calcified ligaments are more difficult to penetrate with a smaller diameter needle.

Conclusions

There is a very high incidence of PDPH using 22G Quincke needles. The benefit of 22G needles is operator ease and a lower failure rate. Since the PDPH rate remains low using a 22G Whitacre needle, this should be used in difficult cases and for diagnostic lumbar punctures. Given the known increase in complications, there is insufficient justification for the use of 22G Quinke needles for lumbar punctures or spinal anaesthesia. BJHM

Carson D, Serpell M (1996) Choosing the best needle for diagnostic lumbar puncture. *Neurology* **47**(1): 33–7

Lynch J, Arhelger S, Krings-Ernst I (1992) Post-dural puncture headache in young orthopaedic in-patients: comparison of a 0.33 mm (29-gauge) Quincke-type with a 0.7mm (22-gauge) Whitacre spinal needle in 200 patients. *Acta Anaesthesiol Scand* **36**(1): 58–61

Sears D, Leeman M, Jassy L, O'Donnell L, Allen S, Reisner LS (1994) The frequency of postdural puncture headache in obstetric patients: a prospective study comparing the 24G versus the 22G Sprotte needle. *Clin Anesth* **6**(1): 42–6

Turnbull D, Shepherd D (2003) Postdural puncture headache: pathogenesis, prevention and treatment. *Br J Anaesth* **91:** 718–29

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