NEONATAL LUMBAR PUNCTURES: PAST, PRESENT AND FUTURE

A SURVEY OF CURRENT UK PRACTICE

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Background:

Up to 30,000 neonatal lumbar punctures (LP) are performed in the UK each year. LP remains the only test able to rule out or diagnose meningitis, but is reliant on a clear sample of cerebrospinal fluid (CSF). Success rates vary from 50-70%.

Aim: To learn about current practices and establish the prevalence of modifications to the original LP technique within UK neonatal units.

Method:

A snapshot survey was disseminated via social media to UK practitioners who regularly perform neonatal LP (neonatal doctors, advanced nurse practitioners) focusing on positioning, stylet removal, perceived success rates and analgesic use.

Results:

The survey received 276 responses over 2 weeks. See figures 2-4.

Figure 3: Respondents' choice of analgesia for LP

Discussion:

Positioning: Although 97% of practitioners surveyed perform LP in the lying position, a radiological study by Oncel⁴ suggested a small increase in mean interspinous distance (3.45 vs 4.08mm) in the sitting position compared to lying.

Stylet removal: 258 (93%) of respondents use a stylet. Of these, 89% of practitioners remove the stylet in the late position (where they would expect to collect CSF). Removing the stylet earlier, may prevent the needle from being inserted too far and reduce the rate of bloodstained CSF samples. Early stylet removal is standard practice in some neonatal units. There are to date no large RCTs exploring the effect of stylet removal timing on LP success rate and CSF red blood cell count.

Analgesia: The most popular options are sucrose and non-nutritive sucking, often used together. Chloral hydrate, opiates and benzodiazepines are less often used, possibly due to their sedative effect and need for a period of monitoring which may involve unnecessary separation of mother and infant. Although licensed in term neonates, topical local anaesthetic is rarely used. Optimising analgesia may minimise infant movement, increasing the chance of a successful LP.

1891

First recorded LP performed in a lying position by Heinrich Quinke to treat hydrocephalus. No anaesthetic was used^{1,2}.

Figure 1: Equipment and positioning used by Quinke

1956

Epidermoid tumours found to be associated with LP - assumed to be related to seeding of skin cells³. Stylet use recommended.

Figure 2: Respondents' preferred position for LP

2018

Figure 4: Positions in which respondents remove the stylet. 1.1% (3) responded 'other'

Limitations:

The survey was publicly available on social media. Only practitioners with access to social media (Facebook or Twitter) had access to the survey. A large section of the target population may have been missed. A response rate cannot be calculated.

Conclusion:

- Most practitioners perform neonatal LP in the lying position and remove the stylet late, similar to the originally described technique.
- Non-nutritive sucking with milk or sucrose are popular. Topical local anaesthetic can be added for term infants.
- Poor success rates may be improved by exploring the effects of positioning (lying versus sitting) and stylet removal timing. A randomised controlled trial is currently underway (NeoCLEAR).

2019+

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in newborns

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