Techniques to increase lumbar puncture success in newborn babies: the NeoCLEAR RCT

Charles C Roehr,[1,2*] Andrew SJ Marshall,[1] Alexandra Scrivens,[2,3] Manish Sadarangani,[4,5] Rachel Williams,[2] Jean Yong,[3] Louise Linsell,[2] Virginia Chiocchia,[2] Jennifer L Bell,[2] Caz Stokes,[6] Patricia Santhanadass,[6] Ian Nicoll,[3] Eleri Adams,[3] Andrew King,[2] David Murray,[2] Ursula Bowler,[2] Kayleigh Stanbury[2] and Edmund Juszczak[2,7] on behalf of the NeoCLEAR Collaborative Group

[1]Department of Paediatrics, Oxford University Hospitals NHS Foundation Trust, John Radcliffe Hospital, Oxford, UK
[2]National Perinatal Epidemiology Unit, Clinical Trials Unit, Nuffield Department of Population Health, University of Oxford, Oxford, UK
[3]Newborn Care Unit, Oxford University Hospitals NHS Foundation Trust, John Radcliffe Hospital, Oxford, UK
[4]Vaccine Evaluation Center, BC Children's Hospital Research Institute, Vancouver, BC, Canada
[5]Department of Pediatrics, University of British Columbia, Vancouver, BC, Canada
[6]Support for the Sick Newborn And their Parents (SSNAP) Charity, John Radcliffe Hospital, Oxford, UK
[7]Nottingham Clinical Trials Unit, School of Medicine, University of Nottingham, Nottingham, UK

[*]Corresponding author charles.roehr@npeu.ox.ac.uk

Disclosure of interests

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Plain language summary

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Plain language summary

Newborn babies are more susceptible to getting meningitis, and this can be fatal or have lifelong complications. A lumbar puncture is an essential test for diagnosing meningitis. Lumbar puncture involves taking a small amount of spinal fluid from the lower back using a needle. Analysing the fluid confirms or excludes meningitis, allowing the right treatment to be given. Lumbar punctures are commonly performed in newborns, but are technically difficult. In 50–60% of lumbar punctures in newborns, either no fluid is obtained or the sample is mixed with blood, making analysis less reliable. No-one knows which is the best technique, and so practice varies. The baby can be held lying on their side or sat up, and the 'stylet', which is a thin piece of metal that sits inside (and aids insertion of) the needle, can be removed either soon after passing through the skin (i.e. 'early stylet removal') or once the tip is thought to have reached the spinal fluid (i.e. 'late stylet removal').

We wanted to find the best technique for lumbar puncture in newborns. Therefore, we compared sitting with lying position, and 'early' with 'late' stylet removal.

We carried out a large trial in newborn care and maternity wards in 21 UK hospitals. With parental consent, we recruited 1082 full-term and premature babies who needed a lumbar puncture. Our results demonstrated that the sitting position was more successful than lying position, but the timing of stylet removal did not affect success.

In summary, the sitting position is an inexpensive, safe, well-tolerated and easily learned way to improve lumbar puncture success rates in newborns. Our results strongly support using this technique in newborn babies worldwide.

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This report

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