

Academic Emergency Medicine Editor-in-Chief Pick of the Month

Prospective Investigation of a Novel Ultrasound-assisted Lumbar Puncture Technique on Infants in the Pediatric Emergency Department

Res Ipsa Loquitur

For a neonate with fever of unknown source, the diligent and prudent emergency care provider usually performs a lumbar puncture to exclude meningitis. The imperative of excluding meningitis is a clear, and relatively straight-forward mandate to explain to the parents. It may be more difficult to answer their next question, which is often "will it hurt?"

For those of you who have children of any age, you live with, or remember living with the background fear that your 4 week old would develop a fever, causing you and your partner parent to decide to take your baby to your pediatrician. (Let's just admit it... Most of us would try to get our baby to our pediatrician rather than the ED, if for no other reason than because of LP-related fear). There, let's suppose, your fearsome specter came true, as your pediatrician decided that your sweet little baby needed to go over to the ED for a septic workup, including an LP. What is the first thing you want to know? I bet what you want to know is "Who the hell is going to stick a needle into my sweet little baby's back?"

The answer to that question for most parents is whoever is on duty in the ED.

Why would I pick a paper that describes an incomplete randomized controlled clinical trial—one that barely made it through AEM's peer review? The answer is because of *Res Ipsa Loquitur*: the thing speaks for itself. The technique tested by Gorn and colleagues considers both the patient and parents. Why would you not take an ultrasound probe and place it on the back of the baby to find your landmarks? This preliminary

randomized trial using ultrasound, resulted in better LP performance than no ultrasound. My inference is that ultrasound gives the needle-holder a better 3-D frame of reference, and an anatomically correct starting place for anesthesia and needle insertion. In my own experience as a teacher of emergency medicine, I must admit the most common problem I see with novices doing LPs in little babies is trying to put the needle into the sacrum. Which brings me to a summary of what LPs in babies should and should not be:

A lumbar puncture in an infant should be: 1. Fast, 2. Reassuring to parents, 3. A cause of minimal pain, and 4. A definitive answer to whether or not the patient has meningitis.

A lumbar puncture in an infant should not be: 1. A bone marrow biopsy, 2. Phlebotomy from an unknown vessel somewhere in the back, 3. Harrowing for parents, and 4. A source of more ambiguity.

I think ultrasound will help make LPs the former rather than the latter.

The present study should motivate researchers to repeat the study in a larger sample. The data suggest no harm, and a reason to hypothesize socioemotional benefits, including reduced parental anxiety. Perhaps future qualitative research can elucidate the impact of ultrasound assisted LP on parental trust in physicians.

Best wishes,
Jeffrey A. Kline, MD
Editor-in-Chief, *Academic Emergency Medicine*

Narrative Summary

Zachary F. Meisel, MD, assistant professor of emergency medicine at the Perelman School of Medicine at the University of Pennsylvania, places the EIC Pick into perspective in the emergency setting:

Why do missed lumbar punctures in babies make us feel so bad? After all, it's a safe procedure—even when it doesn't work out, serious complications are very rare. But still, as we position our baby patients into curls of wailing fury, we pray for that easy tap. A failed tap is humbling, not least because it leaves too many unresolved questions. A neighbor once described to me the ordeal of her child's bloody tap. Her otherwise healthy neonate spiked a nighttime fever and this mother landed in the local ED with her child for a serious bacterial infection workup. Watching her new baby receive the multiple-poke LP was difficult. But harder still was what happened next. The CSF had $>10,000$ RBCs, an inconclusive (or potentially positive) result. Despite all the other negative tests, the bloody spinal fluid triggered a cascade of additional medical care: 3 types of IV antimicrobials, transfer to a higher level of care, and a two-day hospital admission, with multiple extra blood draws and other invasive stuff. In the end, the conclusion was that the tap was traumatic and there was no serious infection. From my view, she received proper care. But from my neighbor's perspective, her baby and her family was tortured with needles, medications and unnecessary care. All because of the difficult tap. This mom—and doubtless the emergency physician too—would have jumped at an opportunity (even if it not perfect) to avoid this ordeal. Perhaps, an ultrasound assisted lumbar puncture would have provided such an opportunity.