Comment

What is a paresthesia? The authors of this study defined paresthesia as an evoked abnormal sensation, not being back pain at the site of needle insertion during the procedure. Only paresthesiae that occurred during spinal needle insertion were recorded as a positive result.

This definition is very vague, and in my opinion not very helpful in describing a possible clinical problem. I think most anesthesiologists would define paresthesia as a typical sensation of tingling or pain, away from the site of injection and radiating in character. A typical paresthesia is elicited when a nerve or nerve root is stimulated, either by direct contact with the advancing needle or a cold fluid, or indirectly by various mechanisms. Puncture of the dura itself may be associated with an unpleasant sensation, but this sensation is not a paresthesia in terms of nerve (root) irritation.

As the authors state, it is important to prevent paresthesiae for two reasons: A paresthesia is unpleasant for the patient, but more importantly, in case of nerve trauma, paresthesiae may be associated with neurological sequelae. For this reason, the focus should be on possible nerve (root) damage when defining paresthesia, not on any unpleasant sensation.

Perhaps it is their definition of paresthesia that explains the high incidence found in this study. Nine percent in the spinal group and thirty-seven percent in the CSE group! These figures are totally unacceptable if they were to represent contact between spinal needle and spinal nerve root. With proper technique, the incidence of a true paresthesia should be close to zero, both with spinal and CSE anesthesia.

One explanation offered by the authors for the higher incidence of paresthesiae associated with CSE is failure to appreciate dural puncture, resulting in advancing the spinal needle too far. I strongly disagree. Especially with the needle through needle technique and a pencil-point spinal needle as used in this study, few clinical signs are as clear and unmistakable as the dural click when the needle punctures the dura mater, and there is no need to advance the spinal needle to the maximum limit permitted by the epidural needle.

Some locking devices move the needle further inward during the locking process, and this advance may cause a paresthesia; however, no such device was used in this study.

In our department, CSE is a very popular technique among staff and residents alike and both observing and asking the patient for any sign of paresthesia is standard procedure; it is our experience that the occurrence of a paresthesia is a rare event, even among residents with relatively limited experience. Therefore, in my opinion, an incidence of 37% indicates that either something is wrong with the definition, or with the equipment.

Rudolf Stienstra, M.D., Ph.D.

■ PCEA Compared to Continuous Epidural Infusion in an Ultra-Low-Dose Regimen for Labor Pain Relief: A Randomized Study

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Patient-controlled epidural analgesia (PCEA) has been used over the past decade, with many studies showing a decrease in drug consumption compared to use of continuous epidural infusion (CEI). This prospective, randomized study investigated whether an ultra-low dose of local anesthetic with the opioid regimen could be used and still decrease drug consumption with PCEA compared with CEI.

Eighty women received either CEI with ropivacaine 1mg/mL and sufentanil 0.5mg/mL, 6mL/h or PCEA with 4mL demand doses with a 20-min lockout. The epidural starting dose was the same for the 2 groups, 8mL of the study solution. A rescue bolus dose of 5mL of study solution could be given if necessary and repeated 3 times up to 15mL of rescue bolus doses. Pain was scored on a 10-point Visual Analog Scale (VAS) and was registered before receiving epidural block and 20min after the bolus dose, with subsequent hourly assessments until delivery was complete. Assessment also included epidural efficacy, motor block, pruritus, and need for nitrous oxide.

Forty patients were in each group, which were equal in all respects, except that labor was induced in 5 patients in the PCEA group and in none in the CEI group. The patients' subjective assessments of pain relief were similar in the groups. The total drug consumption in the PCEA group was 33% lower and hourly consumption 25% lower than in the CEI group. The hourly doses in the PCEA group ranged from 0–10.63mL/h compared to 6–11.6mL/h in the CEI group. Mean total sufentanil consumption in the two groups were 17.5mg and 26mg, respectively. Thirteen women in the PCEA group and 18 in the CEI group needed an extra bolus dose. After delivery, 82.5% of the PCEA patients and 85% of the CEI group thought that the epidural had provided the pain relief expected. More than 90% of the PCEA patients felt safe with the treatment, thought it was good to be in control of their own doses, and would chose the same method again. The duration of labor was slightly reduced in those in the PCEA group compared to those in the CEI group. One baby in the PCEA group was diagnosed with *Escherichia coli* sepsis and had Apgar scores of 1-3-3. Pruritus was experienced in 50% of patients in both groups.

PCEA with ultra-low doses of ropivacaine and sufentanil reduced drug consumption with few and man-

ageable side effects. This technique provides individual titration of doses to an acceptable degree of pain relief.

Comment

This study adds to a number of previous studies that have compared PCEA with CEI. The investigators state that their intention was to investigate what they described as an "ultra-low dose of local anesthetic with opioid regimen". Few would agree with this description as applied to the epidural solution, which was by no means "ultra-low" in concentration, being typical of past[1, 2] and current regimens,[3, 4] and more concentrated than used by some.[5, 6] However, they did restrict the hourly dose available by commencing the continuous infusion at a low rate and allowing only small bolus doses at a relatively long lockout interval for the PCEA regimen. In addition, supplementation was only permitted with the same solution, to a total of three extra doses (5mL each). This methodology resulted in very low hourly local anesthetic consumption, although this is achievable by other means.[1, 7]

Significant findings were that less than half the women in the CEI group, and only a third in the PCEA group, needed a supplement; and that drug requirement was significantly reduced by PCEA. The rate of intervention to supplement the maintenance regimen is a surrogate measure of analgesic effectiveness, because fewer supplements may be indicative of fewer episodes of unrelieved pain. A further benefit of fewer interventions is a reduction in staff workload, which aids nursing and midwifery management and may lower salary costs. Meta-analysis shows fewer anesthetic interventions (risk difference 27%, 95% CI 18–36%; $P<0.00001$) and less local anesthetic use with PCEA compared with CEI.[8] There is some evidence that PCEA using a background infusion, with bolus doses on demand, further reduces supplementation rate.[9–11]

In an Australian population, a similar PCEA regimen, supplied without restriction, was associated with a higher supplementation rate but better pain relief[12] (median pain scores 0–2 compared with 3–4 in this study). The apparent stoicism and more modest expectations of epidural pain relief of this Scandinavian population are worthy of comment, highlighting the variability of outcomes from heterogeneous populations and suggesting caution in extrapolating others' results to the epidural service you provide.

If one thing about PCEA is clear, it is that a number of approaches are effective and provide high maternal satisfaction, while employing local anesthetic in a very safe manner.

Michael Paech, M.B., B.S, F.A.N.Z.C.A

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■ Patients with Severe Preeclampsia Experience Less Hypotension during Spinal Anesthesia than Healthy Parturients: A Prospective Cohort Comparison

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When a severely preeclamptic women requires cesarean section (CS), many practitioners prefer regional anesthesia because of the hazardous nature of general anesthesia in such patients (difficult airway, hemodynamic consequences of laryngoscopy and intubation). Although spinal anesthesia has been avoided because of the risk of severe hypotension, several studies have shown the hemodynamic effects of spinal and epidural anesthesia are similar, especially when a small-dose spinal anesthetic is used as part of a combined spinal epidural anesthetic. To compare the hemodynamic effects of spinal anesthesia in women with severe preeclampsia to