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Anesthesiology
73:587, 1990

Local Anesthetics and Post-Dural Puncture Headaches

To the Editor:—I read with great interest the study by Naulty *et al.* on the relationship of local anesthetic used and post-dural puncture headaches ("PDPH").¹ This paper adds yet another "twist" to the somewhat confusing list of factors that may, or may not, affect the incidence of PDPHs. There are, however, some questions that need to be addressed before the "two-phase" PDPH hypothesis these authors suggest can be considered.

If low concentrations of lidocaine or bupivacaine in the cerebrospinal fluid (CSF) cause vasoconstriction followed by reactive hyperemia of intracranial blood vessels with resulting headache, as postulated, then a certain percentage of patients who receive epidural anesthesia should develop a PDPH. Significant concentrations of local anesthetic deposited into the epidural space can be measured in the CSF.² Therefore, by the same mechanism, epidurally administered local anesthetics (lidocaine and bupivacaine) should cause an "immediate" phase headache. To my knowledge, this does not occur. It seems more likely, of the explanations offered by Naulty *et al.*, that the role of glucose may be more important than the local anesthetic. This is supported by the fact that local anesthetic solutions for epidural use do not contain glucose.

Moreover, if the local anesthetic is playing an important role, we might expect a difference in the onset and quality of PDPHs after diagnostic lumbar puncture and those after subarachnoid block. Since local anesthetic is not injected after a diagnostic puncture, the headache that develops in these patients should occur later (>36 h) when compared to patients receiving a subarachnoid block with lidocaine or bupivacaine. I would be interested to know if this is the case.

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In Reply:—The author of this letter has raised some interesting and thoughtful questions, revolving around three issues:

Headaches following epidural anesthesia. Several studies^{1,2} have described the incidence of headache after uncomplicated epidural anesthesia for parturition to range from 10–30%, usually with a duration of less than 24 h. In the month since we received this letter, we have carefully assessed all of our patients who underwent uncomplicated (*i.e.*, no dural puncture) epidural anesthesia for vaginal (0.0625–0.125% bupivacaine) and cesarean delivery (2% lidocaine with 1/200,000 epinephrine) for postpartum headache. Interestingly, significantly more ($P = 0.003$, chi-squared) patients who had epidural anesthesia with the

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(Accepted for publication June 25, 1990.)

Finally, if this "first-phase" headache were due to local anesthetic and not CSF leakage, then prophylactic epidural blood patches should rarely be effective. Though controversial, there are many reports on the efficacy of prophylactic blood patches.³ Those that object to their use do so not because they are ineffective, but for other reasons.⁴

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(Accepted for publication June 26, 1990.)

high concentrations of lidocaine for cesarean delivery reported headaches (34%) than patients receiving dilute bupivacaine for vaginal delivery (16%). All of these headaches resolved within 36 h. We plan to continue this study to determine the true incidence of headache after uncomplicated epidural anesthesia with various epidural anesthetic drugs, and we thank the authors for their suggestion. We feel that the role of the drug used for spinal anesthesia in the production of this "immediate-phase" headache remains unclear at the present time.

The time course of headache after diagnostic lumbar puncture. It is impossible to determine from the literature what the time course for headache after diagnostic lumbar puncture would be if performed