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Different Injectate Volumes in Cervical Medial Branch Blocks: Does Increased Diagnostic Accuracy with Smaller Injectate Volume Lead to Changes in Outcome?

To the Editor:

We read with great interest the article by Cohen *et al.*,[1] and we complement the authors on such a well-designed randomized study. Cohen *et al.*[1] highlight the importance of improving diagnostic efficacy of cervical medial branch blocks by injecting two different volumes (0.25 and 0.5 ml) of injectate. We note from the results that three nerves were missed in *each* treatment group, indicating a 93% accuracy rate. Thus, missing the nerve is more of a "technical challenge" rather than being due to the volume of local anesthetic injected (0.25 *vs.* 0.5 ml). As shown in table 1 of their article, the authors note that six (54.5%) of the medial branch blocks with 0.25 ml *versus* three (25%) of the medial branch blocks with 0.5 ml received greater than 50% pain relief. Decreasing the volume of local anesthetic by 50% led to doubling (from 25 to 54.5%) of pain relief. Cohen *et al.*[1] then comment in the discussion section: "it is interesting to note that the higher incidence of inadvertent spread to untargeted nervous tissue did not translate to reduced pain scores in the 0.5 ml." This leads us to conclude that if this is truly the case, that *decreasing* the volume of injectate to improve the diagnostic accuracy led to *increased* prevalence of pain relief, then the volume injected does not really matter in improved outcomes. That is to say, using volumes of 0.25 or 0.5 ml will produce similar outcomes in diagnostic cervical medial branch blocks with comparable true positive rates (93%).

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In Reply:

We would like to thank Drs. Datta and Manchikanti for their astute comments regarding our article.[1] The authors correctly point out that patients who received the higher volume of injectate in our study[1] actually experienced—somewhat paradoxically—a smaller decrease in pain scores. However, we believe it is imperative to point out that this association in no way implies a causative relationship. Specifically, this study was neither designed nor powered to detect a difference in postblock pain scores. Achieving this goal would ideally employ an enriched enrollment design, in which patients with facetogenic pain were preidentified in a "run-in" phase by postblock pain relief, akin to the methodology sometimes used in clinical trials evaluating medications.[2,3] Furthermore, it cannot be determined from this study whether this positive response was clinically meaningful or truly therapeutic (*i.e.*, provided long-term benefit), as Manchikanti *et al.*[4] themselves suggested.

Instead, the sole purpose of this study was to compare accuracy rates between two different approaches, using two different volumes (*i.e.*, four techniques). The decision to use postblock CT scans in patients with chronic neck pain was one of convenience, but we could have just as easily chosen to substitute asymptomatic volunteers for patients with pain, as Dreyfuss *et al.*[5] did for lumbar medial branch blocks, or perform injections with colored dye in cadavers, as is often done to gauge accuracy for ultrasound-guided nerve blocks.[6] The operative question we believe needs to be answered now is whether this enhanced specificity translates to improved outcomes.

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