

Neurological Infarctions Following Cervical Transforaminal Epidural Steroid Injections

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Introduction: Cervical transforaminal injections of corticosteroids/local anesthetics are commonly performed in patients with cervical radiculopathy. One of the investigators (MSW) has reviewed a number of medicolegal cases involving brainstem infarction after this procedure. In addition, there are published case reports of spinal cord infarctions. To better characterize these serious adverse events (SAEs), all U.S. physician members of the American Pain Society were surveyed (n = 1,404).

Methods: Anonymous surveys were sent asking about known neurological SAEs following a cervical transforaminal injection of local anesthetic, corticosteroid, or both. Additional variables were year of occurrence, setting where the procedure was performed, specialty of the treating physician, use of fluoroscopy/contrast/local anesthetic/corticosteroid, doses administered, and CT/MRI/autopsy findings. Undeliverable letters were excluded (n = 64).

Results: In all, 286 of 1,340 surveys (21.3%) were returned. Of these, 61 responses detailed 78 severe neurological complications associated with cervical transforaminal injections. Outcomes included brainstem/cerebellar/cerebral infarcts (n = 13), spinal cord infarcts (n = 11), concurrent brain/spinal cord infarcts (n = 2), other neurological sequelae (n = 23), or unspecified (n = 29). Twelve cases resulted in a fatal outcome, six of which were associated with brain infarction. Seventy-seven percent were performed by anesthesiologists and 17% by physiatrists. Medications included corticosteroid plus local anesthetic (92%), corticosteroid alone (6.2%), and air embolus (1.5%). All 4 cases with steroid alone involved methylprednisolone, resulting in cerebellar infarct (n = 3) or posterior cerebral territory infarct (n = 1). Three of these were fatal outcomes, and two autopsies revealed no vertebral artery trauma.

Conclusions: This study demonstrates a significant risk of serious neurological injury after cervical transforaminal epidural steroid injections. The exact mechanism is yet to be determined; however, the results of this study suggest a strong correlation with the use of methylprednisolone. Other possible mechanisms include vertebral artery injury with thrombus formation or an inflammatory response to the methylprednisolone at the level of the central nervous system end arteries.

References

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Funding: Department of Family and Preventive Medicine, University of California, San Diego.