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Commentary

Interventional pain procedures and vasovagal reactions: Proceed with vigilance

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Trigger point injections (TPI) are one of the most common procedures performed in pain medicine. Over 674,400 TPIs were performed in the United States in 2020, according to Medicare Part B claims data from the Centers for Medicare & Medicaid Services Physician/Supplier Procedure Summary [1]. This represents a procedural volume greater than that of peripheral nerve blocks, sympathetic nerve blocks, disc procedures, and interlaminar cervicothoracic epidural injections [2,3], and rivals that of interlaminar lumbar epidural injections [3]. Interventional spine injections (e.g. medial branch blocks, epidurals, intra-articular injections) are associated with potential risks that are rare but catastrophic (e.g. epidural hematoma, spinal cord injury, quadriparesis [4–6]). Because TPIs target specific portions of skeletal muscle [7] rather than nerves, joints, or non-compressible structures, it is perhaps reasonable that TPIs may appear innocuous by comparison.

In this issue of the Journal, two publications should give pause to any perception that TPIs are risk-free. Hattenbach and colleagues [8] present a case report in which they describe a 36-year-old female with myofascial pain scheduled for an ultrasound-guided trapezius, levator scapulae, and rhomboid trigger point injection. Her medical history was unremarkable for any neurologic or cardiovascular diagnoses. A 27-gauge, 1.5-inch needle was placed into a taut myofascial band via ultrasound guidance, and 1 mL of preservative-free 1% lidocaine without epinephrine was injected. Immediately after the needle was removed and re-inserted into an adjacent trigger point, the patient lost consciousness and became pulseless. Chest compressions were performed and an automated external defibrillator reported a non-shockable rhythm. Return of spontaneous circulation occurred after 1 min of cardiopulmonary resuscitation, and the patient quickly regained consciousness. A subsequent cardiac evaluation yielded no evidence of an underlying arrhythmia or ischemic event, leading to a diagnosis of vasovagal syncope complicated by asystole.

Debrosse and colleagues [9] present a systematic review that compares analgesic and functional outcomes from among a variety of TPI injectates (e.g. local anesthetic versus botulinum toxin A) and summarizes reported harms. Out of the 15 studies selected for inclusion in the safety analysis, only three of them reported zero complications. Although the adverse effects described were usually mild and transient (e.g. discomfort or pain with injection), some symptoms initially suggested a potential nerve injury (e.g. limb heaviness and numbness [10], paresthesias [11], dysphonia [12]). Other potentially dangerous complications from TPIs have been reported elsewhere in the literature (e.g. pneumothorax [13], cervical epidural abscess [14], pneumocephalus [15]).

Vasovagal reactions merit particular attention. Their estimated incidence during interventional pain procedures can approach 10% [16,17], and they can quickly progress to a life-threatening emergency (e.g. cardiac arrest). Perhaps even more alarmingly, any patient undergoing any procedure is at potential risk. Vasovagal cardiac arrest in apparently healthy patients has been reported in the context of intrathecal injections for anesthesia [18], as well as with needle placement without the administration of any injectate [19,20]. Periprocedural pain and anxiety, a history of syncope, and a sitting position used for the procedure are putative risk factors [20,21], and the cessation of verbal responsiveness along with the onset of bradycardia, hypotension, and cyanosis may herald an impending cardiac arrest [18], but vasovagal reactions are rarely predictable. It should be noted that in the case report presented by Hattenbach and colleagues, the patient was also apparently healthy and of a relatively young age, in a sitting position for the procedure, and reported pre-procedural anxiety. However, the patient had no previous history of syncope, and her anxiety was not of such severity that pharmacologic anxiolysis was deemed necessary. This illustrates the reality that patients usually present with some, but not all, risk factors for a given complication, and clinicians must make decisions without the benefit of hindsight.

Nonetheless, there are valuable lessons to be learned. Likely the most important is the recognition that all procedures in pain medicine are associated with risks. Pain physicians must recognize that for any procedure, no matter how "small," the spectrum of possible complications

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includes serious harms such as vasovagal cardiac arrest. Some straightforward precautions should be followed with every patient, such as taking a comprehensive history and physical (e.g. asking for a history of syncope, arrhythmias, or severe periprocedural anxiety), monitoring vital signs, and considering a recumbent procedural position if tolerated by the patient (or using a procedural table on which a sitting position may be quickly converted into a recumbent position).

Despite taking all reasonable precautions, an adverse event may occur regardless. In this circumstance, immediate detection and responsiveness are essential for preventing further clinical deterioration and minimizing the risk of long-term harm to the patient [8,18]. Serious complications from interventional pain procedures may be uncommon, but it remains incumbent on pain physicians to stay vigilant and prepared.

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Declaration of competing interest

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