Local Anesthetic “Resistance”

Andrea M. Trescot, MD

The incidence of inadequate analgesia despite technically well performed injections led our clinic to prospectively test patients for response to a variety of local aesthetics. Skin testing was performed on the skin of the forearm away from the site of pathology. Patients were asked to identify “which is the most numb” of the skin wheals. Although most were equally numb to all three local anesthetics (lidocaine, bupivicaine, and mepivacaine), 7.5% of the patients consistently chose mepivacaine as the local anesthetic resulting in the most hypoesthesia. For patients who had previously undergone an unsuccessful procedure with bupivicaine (the standard local anesthetic used in our practice), the same procedure with mepivacaine provided good relief. Patients are now questioned on their initial evaluation about a history of difficulty getting numb, for instance at the dentist, and preemptively skin tested prior to any invasive procedure.

**METHODS**

All patients presenting to The Pain Center for the month of March 2001 were interviewed specifically as to whether they had become “numb” after their last injection. All patients who reported poor or minimal temporary relief from an injection in the prior month, and all new patients who reported a history of difficulty getting numb from injections (such as for sutures or the dentist) were evaluated. Three tuberculin syringes were prepared for each patient consisting of a small amount of one of each local anesthetic: lidocaine, bupivicaine, and mepivacaine. A standard amount of liquid was drawn into each type of syringe so that the volume in the syringe would identify to the technician at a glance which local anesthetic was being injected (Fig. 1). After alcohol prep, a small aliquot from each syringe was injected subcutaneously via a 30g needle into a different but adjacent area of the forearm, forming a subcutaneous wheal, similar to a TB tine test (Fig. 2). The edge of...
Local anesthetics block the sodium channel of the nerve, which stops depolarization. We suspect that changes in the channel itself (Fig. 6) are the biochemical explanation for the differences in local anesthetic effect observed.

This pilot study was limited in many ways. Only those patients with a history of local anesthetic failures were tested. To determine a truer incidence of anesthetic differences, all the patients should have been tested. The screening was only single blinded and there was no control injection such as saline. The screening occurred over a single month period and has not been repeated. However, at least 10% of our patients that month did not get hypoesthetic to our standard anesthetic, bupivacaine. Because of the use of sedation for procedures, patients who do not get numb from an injection may not be recognized at the time of the injection, potentially losing the diagnostic advantage of the injection itself. Mepivacaine appeared to be the local anesthetic most commonly effective in the local anesthetic “resistant” patient. However, the true significance of this observation is not yet known.

CONCLUSION

There may be a significant number of our patients who have undergone ineffective procedures or been denied follow-on treatment because we have not recognized
that they did not get numb from that local anesthetic. Perhaps patients should be taken more seriously when they complain of pain during a procedure despite what should be adequate local infiltration. Perhaps the patients who complain that the injections don’t help might benefit from a reassessment of their response to various local anesthetics.

Author Affiliation:
Andrea M. Trescot, MD
Medical Director,
The Pain Center
1564 Kingsley Ave,
Orange Park, FL 32073
E-mail: amt57@aol.com

REFERENCES