CROSS-LINKED HYALURONIC ACID - A PARADIGM SHIFT IN THE TREATMENT OF NEUROPATHIC PAIN

John A. Campa III, MD, Clinical Neurosciences, Albuquerque, New Mexico, USA

Statement of Problem
Persistent neuropathic pain presents a special challenge to the clinician in current treatment regimens routinely include anti-inflammatory agents, anticonvulsants, tricyclic antidepressants, and nerve blocks. However, at best, the pain is only slightly reduced, and they are burdened by dose limiting side effects, e.g., impaired cognition, constipation and tolerance. Hence, a method of treatment that is safe, prolonged, significant relief, without side effects, does not limit cardiocerebral stability, would be ideal.

While the literature describes the use of cross-linked hyaluronic acid (CL-HA) as a cosmetic dermal filler for soft tissue augmentation, we believe our study is the first to assess its safety and efficacy in the treatment of neuropathic pain.

Naturally occurring HA
Hyaluronic acid (HA), a polysaccharide, is a linear, anionic, polysaccharide molecule, composed of glucuronic acid and N-acetylglucosamine units, naturally occurring throughout the extracellular matrix of skin, cartilage tissue, epidermal and neural tissues. Its molecular weight is 5-10 million Daltons in healthy tissues.

Cross-linked HA
Cross-linked HA commercially available and approved in the management of non-neuropathic conditions include lidocaine (Allergan) HA. Intradiscal therapy, 2.2-25 mg/mL, molecular weight 5-10 million Daltons. (Radiesse) and Medicis HA. (Cosmeceuticals) HA. The molecular weight of 25-100 mg/mL, molecular weight 1 million Daltons. It is the cross-linking of the HA normally a liquid, metabolized in a day, that holds in individual polymeric chains, resulting in the formation of a viscous liquid, accounting for its longevity (6-12 mos), and its hygroscopic ability to absorb 1000 times its weight in water.

Aim
The aim of this study is to assess the safety and efficacy of cross-linked hyaluronic acid in the treatment of neuropathic pain.

Materials and Methods
A 34-month retrospective chart review was performed, identifying 15 patients (7 female, 8 male) with persistent neuropathic pain (Table I). The average age was 57.5 yrs. (25-94 yrs), with a mean pain duration of 86 mos., range 2-200 mos. Among this group, twenty-two separate neuropathic pain syndromes were identified and initially subjected to differential local anesthetic neural blockade to determine the most reactive neural point controlling the painful area. Pending a positive response and after the initial anesthetic block subsided, i.e., 72 hrs. later, targeted, neural matrix anti-neuropathic injection of CL-HA was then performed (Table II). All patients provided informed consent (Fig. 1).

Treatment of VAS pain scores ranged from 0-10.2, with an average of 7.510. Note: the use of VIDA approved cosmetic CL-HA agents in this study was off-label.

Discussion
The injectable HA was administered either through a 27G needle, or via a variable length, anatomic branching 27G microcannula (Dermaroller®), after a 27G injection port was prepared. The results were assessed by the degree and duration of pain relief from a single injection.

Results
All patients achieved pain relief, with the average post-procedure VAS pain score being 5.1-10. The range was 0-5.5-10. The average time to achieve pain relief was 20 hr., and the range was from 0-45 hr. Average duration of pain relief was 7.7 mos., and ranged from 2.5-18-1 months. There were no untoward reactions or effects.

Conclusion
We conclude that targeted, neural sensory anti-neuropathic injection of cross-linked hyaluronic acid is a safe and effective method of treating neuropathic pain. Its routine use should be considered early in the treatment of this patient group.

References
