Botox Injections Provide Pain Relief for Knee Osteoarthritis

Intra-articular injections are considered a last resort nonoperative treatment for refractory knee osteoarthritis. Now, patients may achieve a significant reduction in pain for knee OA using a botulinum toxin A injection.

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Interview with Bahman Jabbari, MD, FAAN

The use of botulinum toxin A (BoNT/A) injections for knee osteoarthritis (OA) could be a viable treatment for patients suffering from dibilitating pain and limited mobility.

In a study published in *Pain Management & Rehabilitation*,[1] researchers in Taiwan found noticeable success using intraarticular (IA) injections of BoNT/A on patients suffering from knee OA, with noticeable improvements achieved in pain symptoms and functional movement up to 6 months post-treatment.

The study is one of the first to examine both immediate and extended effects of IA injections using BoNT/A for knee OA pain despite uncertainty about the precise mechanisms for the positive findings.

Botox Improves Refractory Knee Osteoarthritis

"The literature on the use of IA BoNT/A injections for treating arthritis is scant," the authors noted, and indeed, only a handful of studies in recent years have tested the possible analgesic benefits of IA injections using BoNT/A.[2–4]

Osteoarthritis affects well over 15 million Americans,[5,6] and many cases of knee OA can become refractory. For these patients, IA injections have been the last line of non-operative treatment. Typically, IA injections have included corticosteroid (CS), hyaluronic acid (HA), and platelet-rich plasma (PRP).

Botox is known to inhibit the exocytotic release of acetylcholine from motor nerve terminals,[7] which has made it a useful treatment option for conditions that involve spasticity, painful movement disorders, and other conditions that involve muscle contractions.[8–10] However, while doctors are beginning to recognize the possible analgesic benefits of Botox injections for other conditions, the mechanisms behind this analgesia are still not fully understood, according to the authors.

Favorable Results Achieved With No Side Effects

Forty-six patients with a prior diagnosis of knee OA were recruited from an outpatient teaching clinic in Taiwan participated in the study,[1,11] all of which had a radiographic severity grade between 2 and 3 in the knee joint, according to the Kellgren-Lawrence Scale,[12] and previous failures with other treatments, including oral or conservative therapies of nonsteroidal anti-inflammatory drugs or physical therapy.

Patients were injected with 100 units of botulinum toxin type A (Botox, *Allergan Inc.*), which was diluted with 2 mL of preservative-free 0.9% saline solution per 100 unit vial. Of the 46 patients included in the study, 21 patients received the Botox injection, and 20 were designated to the control group.

While pain scores using a visual analog scale (VAS) did not differ significantly between the groups at baseline, patients who had received the BoNT/A injection experienced significant improvement in pain symptoms compared to those who had received no treatment. After 1 week post-treatment, 52.4% (11/21) of BoNT patients reported a decrease in VAS scores that was above the threshold for a minimal clinically important improvement (MCII), compared to just 5.0% (1/20) of the controls ($P = .001$).

At 6 months post-treatment, the improvement in pain remained, with 52.4% (11/21) of BoNT/A patients reporting a decrease in VAS greater than the MCII, compared to 0% (0/20) of controls ($P = .001$). Similar differences in results also were found with Lequesne Index Scores, which helped patients self-report measures of pain, walking ability, and daily living abilities,[13] as well as the WOMAC index[14] for disease-specific measures of pain, stiffness, and physical function.

Botox: A Viable Clinical Option?

According to the authors, their findings offer evidence of the clinical utility of BoNT/A injections for managing pain from knee OA, especially among patients with refractory complaints, who may be less inclined to resort to a surgical intervention.

After one injection, the average decrease in knee pain was 42.6% from baseline after a week posttreatment. And after 6 months, the analgesic effects of the single injection decreased slightly to 34.9%, an indication the treatment may have long-term analgesic benefits for knee OA patients.

While the small sample size of the study is an obvious limitation, perceptions about the analgesic uses of BoNT/A have been evolving in recent years. Indeed, just last spring, the American Academy of Neurology published its own guidelines on the use of botulinum neurotoxin treatment for a number of conditions, including chronic headaches.[15]

"This study is well done and has used sound methods," said Bahman Jabbari, MD, FAAN, an emeritus professor of neurology at the Yale University School of Medicine in New Haven, Connecticut. "It would have been nice to have a scale to reflect patient's satisfaction with pain relief, such as the Patient Global Impression of Change (PGIC)," since this is a measursement tool that is being used in many new studies, Dr. Jabbari told *Practical Pain Management*.

Dr. Jabbari also noted that the positive results from the 6-month follow-up may not necessarily equate to evidence of a long term clinical benefit from BoNT/A injections since 12 months is viewed as a more acceptable marker of extended clinical efficacy.

Indeed, other limitations of the study could be noted. While patients were randomly selected to the treatment and control groups, BoNT/A patients appeared to have a significantly higher consumption of acetaminophen compared to controls, at 5.28 ± 2.19 and 10.67 ± 3.66 tablets per month, respectively. Whether this may have had an effect on pain scores is unknown.

The dosage of BoNT/A for this condition requires further exploration. Considering that adverse events were virtually absent in the study cohort, the authors recommended a single injection of 100 units as safe and appropriate.[1]

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