

## **BOTULINUM TOXIN-A IS AN EFFECTIVE AND SAFE TREATMENT FOR CHRONIC MIGRAINE PRO**

**Alexander de Ru**

*The Netherlands*

Much debate exists about whether botulinum toxin-A (botox) is an effective therapy for patients with migraine or if it is just an expensive placebo. Main problem is that in many studies a clear concept of why botox should work is lacking. Or as stated by others: "the efficacy of botox has not been established, although it is possible that patient selection criteria, dosage and injection paradigm used were not optimal".

Given the nature of the poison, its effect need to be searched for in its principal action: causing muscle paralysis. Can we correlate muscle relaxation with lessening migraine? Indeed such a possibility exists. Migraine can be provoked by peripheral triggers that cause central sensitization.

Guyuron and co-workers noticed a significant reduction of migraine following transection of the corrugator muscle. At first, this seemed a lucky coincidence because the operation was performed in order to diminish wrinkles in the forehead. However, after confirmation of earlier results, a new paradigm was introduced.

It is a fact that the supratrochlear nerve courses through the corrugator muscle. Therefore, it was hypothesized that a neural entrapment of the supratrochlear nerve might be the cause of irritation that leads to central sensitization and consequently causes the migraine to develop. Also for other nerves and muscles such a mechanism was described. The zygomaticotemporal nerve might be compressed by the temporal muscle and also the greater occipital nerve can be compressed as it pierces the semispinalis capitis muscle.

What is necessary, in my opinion, is to discriminate the patients that might have a neural compression as cause for their migraines from those who have other reasons for their attacks. Notice that migraine is a very heterogeneous disease that has a long list of possible factors influencing and/or provoking the attacks. It is, as Guyuron stated, very likely that not all migraineurs will respond to botox. And indeed in episodic migraine the effect of botox is indeed not significant.

However, in more chronic headaches (chronic daily headache, chronic migraine and chronic tension type headache) the effect can be tremendous with very high rate ratios that are very likely to be caused by a genuine effect. Specifically our treatment strategy: pain emanating from the frontal region - aggravation of the pain with pressure on the orbital rim at the site of the supratrochlear nerve – reduction of pain after anesthetic nerve block – reduction of pain with botox in the corrugator - transection of the nerve, is a very promising and easy-to-use algorithm with a 90% success rate in reducing chronic daily headache permanently.

Recently the PREEMPT 2 study, the largest well-designed, placebo-controlled clinical trial until now, has already proven botox to be successful and with only very little chance of causing harm. But, it seems necessary to differentiate patients and injection sites even more in future studies. Possible peripheral trigger sites can be useful in determining which location to inject. Thus, a matter of aiming the right therapy at the right place and the right patient. In that case the effect of less botox can be even larger than the studies have shown so far. With even better results, but especially with a good concept, also the more skeptic colleagues can hopefully be convinced that botox is a medication that with few adverse reactions can cause longterm amelioration of many headaches and can be helpful in selecting patients who might benefit from surgical procedures.

I would like to conclude that certainly not all migraineurs are good candidates for treatment with botox, but that it is a highly effective treatment for some of them.