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Botox without the **needle?**

Botulinum toxin type A effectively administered using pulsed current iontophoresis

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SENIOR STAFF CORRESPONDENT



Dr. Ruggiero

Florence, Italy — Whether Botox (Allergan Medical) or Dysport (Ipsen), botulinum toxin type A is widely used due to its efficacy, relative safety and versatility. The usual mode of administration via injection, however, could change.

According to the results of a recent Italian study, the needle administration method may very well become obsolete, as transdermal delivery of the toxin with pulsed current iontophoresis has shown very promising results.

Marco Ruggiero, M.D., Ph.D., of the department of experimental pathology and oncology at the Medical University of Florence, examined an alternate

method of administering the therapeutic neurotoxin into the skin via pulsed current iontophoresis.

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This circumvented the needle approach, a much-feared obstacle for many patients and a real hindrance in the use of botulinum toxin type A.

Rodent research

Dr. Ruggiero performed a study on six male Wistar rats.

To prepare the treatment site, Dr. Ruggiero used the Ultrapeel Transderm microdermabrasion system (Mattioli

QuickREAD

Botulinum neurotoxins are commonly injected for a variety of diseases as well as numerous cosmetic interventions. A recent Italian study has proven that botulinum toxin type A can be effectively administered into the skin using pulsed current iontophoresis, opening the door to a possible future of needleless administration.

Engineering). He says significant results can be achieved without the abrasion, but they are less reproducible from rat to rat. The abrasion can take up to a few minutes and is painless.

Following mild abrading of the treatment area, a 40 unit ml of botulinum toxin type A (Vistabex, Allergan Medical) was applied to the skin and subsequent iontophoresis was performed. The proce-

dures lasted approximately 10 minutes.

Controls consisted of application of the neurotoxin onto the skin after hair shearing, but where neither abrasion nor iontophoresis treatment was performed. Controls also included abrasion and iontophoresis treatment, but no application of neurotoxin.

Following the procedure, full-thickness biopsies from both control and treated areas were taken for microscopic examination. Haematoxylin-Eosin staining and immunohistochemistry examination for the detection of botulinum toxin A were performed on the biopsy specimens.

Results for rats sans injections

“Our results demonstrated that pulsed current iontophoresis effectively allowed the delivery of botulinum toxin type A through living mammalian skin.

“The immunohistochemistry results clearly showed that the toxin was localized and in direct association with the striated skeletal muscles found just below the deep dermis,” Dr. Ruggiero tells **Dermatology Times**.

“These results clearly show that pulsed current iontophoresis allows for the transdermal delivery of botulinum toxin type A and is another technique to effectively administer the toxin into the skin, without having to deal with the pains and pitfalls of the needle approach.”

— Marco Ruggiero, M.D., Ph.D.
Medical University of Florence
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According to Dr. Ruggiero, botulinum toxin A could not be detected in biopsies taken from negative controls.

The haematoxylin-eosin biopsy results showed that in untreated rat skin, a thick and well-preserved stratum corneum could be seen. The stratum corneum was slightly less thick in the iontophoresis-treated areas due to the abrasion, but no lesion could be detected in this layer or in the underlying layers of the epidermis.

“Our results demonstrate that botulinum toxin type A could not passively diffuse through intact rat skin, even after the hair shearing and the mild abrasion

required for the electric treatment, thus reinforcing the idea that the iontophoresis was essential for the observed transdermal delivery,” Dr. Ruggiero says.

“These results clearly show that pulsed current iontophoresis allows for the transdermal delivery of botulinum toxin type A and is another technique to effectively administer the toxin into the skin, without having to deal with the pains and pitfalls of the needle approach.

“The repercussions of these positive results could be far-reaching in the medical, surgical and cosmetic arena,” Dr. Ruggiero says. **DT**