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Transcutaneous periorbital electrical stimulation in the treatment of dry eye.

Pedrotti E[1], Bosello F[1], Fasolo A[1,2], Frigo AC[3], Marchesoni I[1], **Ruggeri** A[4], Marchini G[1].

Author information

Abstract

PURPOSE: To evaluate efficacy and safety of transcutaneous application of electrical current on symptoms and clinical signs of dry eye (DE).

METHODS: 27 patients with DE underwent transcutaneous electrostimulation with electrodes placed onto the periorbital region of both eyes and manual stimulation with a hand-piece conductor moved by the operator. Each patient underwent 12 sessions of 22 min spread over 2 months, two sessions per week in the first month and one session per week in the second month. Ocular Surface Disease Index (OSDI) questionnaire, tear break-up time (TBUT), fluorescein staining of the cornea, Schirmer I test and adverse events were evaluated at baseline, at end of treatment and at 6 and 12 months.

RESULTS: OSDI improved from 43.0±19.2 at baseline to 25.3±22.1 at end of treatment (mean±SD, p=0.001). These effects were substantially maintained at 6-month and 12-month follow-up evaluations. Improvement of the values of TBUT was recorded for the right eye at the end of treatment (p=0.003) and found in the left eye after 12 months (p=0.02). The Oxford scores changed in both eyes at the end of treatment and at the 6-month evaluation (p<0.001), and in the right eye at the 12-month evaluation (p=0.035). Schirmer I improved significantly at the end of treatment in the left eye (p=0.001) and in both eyes at the 12-month evaluation (p=0.004 and p=0.039 for the left and right eye, respectively). A significant reduction of the use of tear substitutes was found at the end of treatment (p=0.003), and was maintained during the follow-up (p<0.001).No complications occurred and patients found the treatment satisfying.

CONCLUSIONS: Transcutaneous electrical stimulation was shown to improve DE, both subjectively and objectively, without any adverse effects and has the potential to enlarge the armamentarium for treating DE.

KEYWORDS: Lacrimal gland; Ocular surface

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Transcutaneous Periorbital Electrical Stimulation Appears to Relieve Dry Eye

By Will Boggs MD

October 12, 2016

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NEW YORK (Reuters Health) - Transcutaneous electrical stimulation in the periorbital region appears to relieve symptoms and clinical signs of dry eye, researchers from Italy report.

"The most interesting result was the long-term improvement we obtained in symptoms, in particular the decreasing of the Ocular Surface Disease Index (OSDI) scores," Dr. Emilio Pedrotti from the University of Verona told Reuters Health by email.

He added that "whatever the underlying mechanism that generated or sustained dry eye, the main goal of therapy with this disease is to reduce patient discomfort for as long as possible, and this is exactly what we obtained with Rexon-Eye."

While transcutaneous electrical stimulation has shown efficacy in pain management, physiotherapy, urogenital disorders, and other conditions, no studies have investigated the use of electrotherapy to treat dry eye.

Based on favorable results from another study, Dr. Pedrotti's team assessed the safety and potential efficacy of transcutaneous periorbital electrical stimulation in an open-label study of 27 patients with evaporative (n=18) or hyposecretive (n=9) dry eye.

Mean OSDI scores improved from 43.0 at baseline to 25.3 at the end of treatment and were essentially maintained at six-month and 12-month follow-up evaluations, the researchers report in the British Journal Ophthalmology, online September 22.

Seventeen patients (63%) had improved OSDI scores at the end of treatment, and the other 10 were unaffected. OSDI scores improved by 31% in patients with evaporative dry eye and by 58% in patients with hyposecretive dry eye.

Tear film breakup time, Oxford scores for corneal staining with fluorescein dye, and Schirmer I scores improved with treatment, more so among patients with evaporative dry eye.

Treatment was associated with significant reductions in the use of tear substitutes among both subsets of patients.

The results were maintained for up to 12 months in eight patients, while seven patients reported improvements that decreased in the following months and 12 reported that dry eye was not affected by treatment or that the improvements were lost within the first two months after treatment ended.

"It was surprising that the results, subjective and objective, were in general maintained even 12 months after the end of treatment," Dr. Pedrotti said. "This strongly suggests that Rexon-Eye is capable of restoring the physiological situation and not just merely and momentarily alleviate symptoms."

Three patients experienced local erythema or discomfort following treatment, but no patients requested that treatment be stopped during stimulation.

Dr. Pedrotti said that Resono Ophthalmic (Trieste, Italy) has licensed all rights related to the development, manufacturing and commercialization of Rexon-Eye from TELEA Electronic Engineering, which funded

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