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EC OPHTHALMOLOGY
Case Report

Can TES Improve a Squint?

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Abstract

Objective : To observe whether transcorneal electrical stimulation can be used in amblyopia.

Methods : A case was discussed. Improvement in visual acuity and esotropia was reported after application of TES for 10 consecutive days.

Results: Improvement in VA and esotropia after TES.

Discussion: Recent reports show some improvement in amblyopia after the stimulations using transcranial magnetic stimulation devices. Our patient also improved after TES and we believe that esotropia also improved due to the gained binocularity.

Conclusion: TES may be used in amblyopia.

Keywords: *TES; Amblyopia; Esotropia*

Introductıon

Considering many degenerative retinal and optic nerve diseases there is no proven treatment to stop the course of deterioration. As a result, several million people in the world become blind every year and in the recent years there has been a trend to use transcorneal electrical stimulaton (TES) to slow the progressive degeneration mostly in retinitis pigmentosa (RP) [1]. Research suggests that TES has a cell preserving effect on dying retinal cells and the effect of electrical stimulation is attributable to the activation of several neuroprotective systems and factors [1]. TES also has been used in some optic neuropathies with success [2]. Also recently published data shows the benefits of stimulation therapies like transcranial direct brain stimulation technique (rTMS) in adult amblyopia [3]. Some success has been achieved by rTMS combined with computerized training methods.

Case

A 12 years old boy presented with deep amblyopia OD and 35 prism diopters of esotropia (Figure 1). His visual acuities were 0.005 OD and 1.0 OS by the Snellen chart. Fundus exam was normal ou. His cycloplegic examination did not reveal a refractive error. TES by using Okuvision GmbH for 40 minutes per day for 10 consecutive days was applied. The phosphene threshold was found and 200 percent of the threshold was used for the stimulation. The repeat exam one day after the last session of the therapy revealed visual acuity of 0.4 OD and 1.0 OS. The esotropia degree became 20 prism diopters (Figure 2). The patient was followed for 1 week and his vision OS and esotropia degree did not change.

Figure 1: *Before TES.*

Figure 2: *After TES.*

Discussion

Our report is the first case study that reveals significant improvement of amblyopia by TES. Amblyopia is a cerebral visual impairment and stimulation of the visual pathways and the brain may be the correct strategy. There are reports about transient improvement by rTMS. Another technique that used theta bursts with rTMS for 5 days disclosed improvement up to 78 days [4]. The brain stimulation may help regain some amount of binocularity which is impaired in amblyopes. Many cortical regions seem to be involved in amblyopia but neuroplasticity can be very helpful in the treatment trials. We believe that the binocularity which was gained during TES resulted in improvement of the esotropia in our patient. There may be some questions that come to mind as how long the treatment effect will last or whether longer TES may give even better results, but our treatment approach may give clues for future directions and is another evidence for the benefits of the visual pathway and cortical stimulations.

Conclusion

TES may be considered in amblyopia treatment.

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