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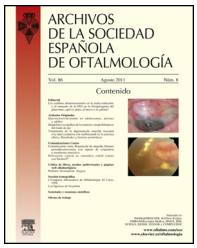

Original article

Botulinum toxin type A as treatment of partially accommodative esotropia☆

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ABSTRACT

Objective: To determine the effectiveness of a botulinum toxin type A injection in both medial rectus muscles in patients with partially accommodative esotropia. Residual deviation and stability of strabismus were evaluated at 18 months follow up.

Method: A prospective, analytical, quasi-experimental study was conducted on a cohort of 21 patients who underwent total cycloplegic refraction and with a residual deviation of at least 14 DP. A botulinum toxin type A dose of 5 IU was injected into each medial rectus muscle for a residual deviation greater than 18 DP, with a dose of 2.5 IU being used for a deviation between 14 and 18 DP. Multivariate logistic regression analyses were performed to relate residual deviation to variables recorded as potential predictors.

Results: A total of 21 patients were included, 33.3% (n = 7) males and 66.6% (n = 14) females. Mean visual acuity was −0.28 ± 0.25 logMAR for right eye (range 0 to −1) and −0.42 ± 0.31 logMAR for left eye (range 0 to −1.3). Mean angle of residual deviation before application of botulinum toxin was 40.95 ± 8.6 DP without spectacles correction, and 22.3 ± 7.99 DP with full cycloplegic refraction. Adverse effects were ptosis in 14.2% (n = 3), diplopia 23.8% (n = 5), and vertical deviation in 33% (n = 7). One patient had a poor outcome, therefore required surgical treatment.

At one year follow up, 85.71% of patients showed good results with esotropia of 12 DP or less, dropping to 71.43% at 18 months of follow up.

Conclusion: Botulinum toxin type A is an effective long-term treatment with a good response in 71.43% of patients. No predictors of good response were demonstrated.

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Uso de toxina botulínica A en el tratamiento de las endotropías parcialmente acomodativas

Palabras clave:
Endotropia parcialmente acomodativa
Toxina Botulínica A
Ambliopía
Estrabismo
Tratamiento
Desviación residual

RESUMEN

Objetivo: Determinar la efectividad de la toxina botulínica (TB) tipo A aplicada en ambos rectos mediales en pacientes con endotropía parcialmente acomodativa (ETPA). Se evaluó la desviación residual y su estabilidad a 18 meses de seguimiento.

Método: Estudio analítico prospectivo, cuasi experimental. Se estudió una cohorte de 21 pacientes con uso de refracción cicloplejica total con desviación residual igual o mayor a 14 DP. Se realizó aplicación de TB en ambos rectos mediales, 5 U de TB para desviaciones residuales mayores de 18 DP y 2,5 U para desviaciones residuales menores. El análisis incluyó regresión logística entre variables para considerar factores predictivos.

Resultados: Se incluyeron 21 pacientes, 33,3% pacientes (n = 7) del género masculino y 66,6% (n = 14) del género femenino. La capacidad visual promedio fue de –0,28 ± 0,25 logMAR ojo derecho (rango 0 a –1) y –0,2 ± 0,31 logMAR ojo izquierdo (rango 0 a –1,3). El ángulo de endodesviación promedio previo a la aplicación de TB se encontró de 40,95 ± 8,6 DP sin corrección y de 22,3 ± 7,99 DP con corrección. Los principales efectos secundarios fueron: ptosis 14,2% (n = 3), diplopía 23,8% (n = 5) y desviaciones verticales 33% (n = 7).

Al año de seguimiento el 85,71% de pacientes tuvieron un resultado bueno con endotropía menor a 12 DP. Estos porcentajes disminuyeron a los 18 meses de seguimiento al 71,43%.

Conclusiones: El uso de TB tipo A permite obtener un resultado motor bueno a 18 meses en la mayoría de los pacientes. No se demostraron factores predictivos para el pronóstico.

Introduction

Partially accommodative esotropia (PAET) is of mixed origin, where the accommodative component does not entirely offset the deviation angle and leaves a significant residual attributed to a non-accommodative essential component.[1]

Mohney et al. affirmed that accommodative esotropia is the most prevalent form of ocular misalignment in Western populations, comprising 28% of strabismus cases in children and half of all endo-deviations.[2] In Mexico, PAET is observed in 14% of all strabismus cases and is the third in order of frequency.[3,4] Conventional treatment has consisted in prescribing total cycloplegic refraction and surgical correction of the residual deviation.

Injecting a botulin toxin (BT) in extraocular muscles is a technique that alters ocular alignment, producing temporary palsy and an overcorrection of strabismus which induces a shortening of the antagonist muscle. Histology demonstrates density changes in sarcomeres, which enhances permanent ocular alignment.[5,6]

Several authors have reported good results using BT for treating congenital esotropia, including Scott et al., Mc Neer and Gómez de Liaño et al.[7] However, its use in PAET has only been reported in isolated cases.

The objective of this study was to determine the effectiveness of BT type A in transconjunctival injection applied to both median rectus in patients with PAET. Residual deviation was evaluated with the use of cycloplegic refraction as well as stability with 18 months follow-up.

Subjects, materials and method

A prospective, quasi-experimental analytical study comprising a cohort of patients with PAET diagnostic and use of total cycloplegic refraction at least 8 weeks prior to the application of BT in both median rectus for treating residual deviation in the Strabismus Department of the "Fundación Conde de Valenciana IAP" Ophthalmological Institute. Five U of BT were used for residual deviation greater than 18 DP and 2.5 U for residual deviation angles smaller than 18 DP. The treatment was applied under inhalatory general anesthesia in addition to topical anesthesia, using tetracaine in both eyes. After mechanical irritation at the application site, the treatment dose was injected through the trans-conjunctival intramuscular pathway without electromyographic signal guidance.

The study included patients with PAET diagnostic exhibiting residual deviation of 14 DP or greater regardless of gender and age, whose tutors agreed to participation in the study. The exclusion criteria comprised patients with muscular surgery history, irregular use of cycloplegic refraction or who declined informed consent.

The deviation was measured with the alternating screen maneuver and prisms, measuring distant visual capacity according to patient cooperation with the Snellen chart, HOTV or, with younger children, the Alan chart in logarithmic scale. All the patients underwent a complete ophthalmological exploration, including duction, version, refraction under cycloplegia using 1% cyclopentolate in children over 2 or 1% atropine in children below said age, anterior segment assessment and funduscopy.