TREATMENT OF CHRONIC SIXTH NERVE PALSY

We read with great interest the articles entitled, "The Efficacy of Botulinum Neurotoxin A for the Treatment of Complete and Partially Resolved Chronic Sixth Nerve Palsy" by Repka et al and the accompanying discussion by Dr Biglan in the March/April 1994 issue. This study, and the accompanying review, demonstrate the possible usefulness of botulinum A injection in the treatment of chronic sixth nerve palsies.

Dr Repka et al found that 7 of their 22 cases (32%) were successfully treated and did not require subsequent surgery following multiple injections of botulinum A toxin. Dr Biglan, in referring to a previous study, notes 5 of his 11 patients (45%) did not require surgery following the use of botulinum A toxin. Careful review of Dr Repka’s study shows that 14 of the 22 patients demonstrated, prior to treatment, an ability to abduct the affected eye past the midline. This abduction ability suggests that these patients did not suffer from sixth nerve palsy, but rather a paresis of the abducens nerve. Additionally, there is no mention of saccadic velocity studies or forced duction testing in the abducted position.

Although not specifically addressed in either study, we are particularly interested in the postoperative ocular alignment of those patients who had initially undergone botulinum A injection to the medial rectus muscle and who subsequently had transposition surgery in an effort to correct persistent ocular misalignment. In our work, published in the same issue of the Journal of Pediatric Ophthalmology and Strabismus, one case of chronic sixth nerve palsy underwent injection of botulinum A toxin to the medial rectus muscle prior to adjustable transposition surgery. Interestingly, this was the only patient found to be exotropic following the transposition surgery. Botulinum A toxin prevents the release of acetylcholine from nerve endings, thus producing a flaccid paralysis. Additionally, atrophy of myofibrils has been speculated to occur following injection of the toxin. Whether due to one or both of these effects, transposition surgery may be more "powerful" when applied to an eye that has undergone injection of botulinum A toxin to the antagonist muscle than in eyes that have not received any pretreatment.

In an attempt to create the most rational treatment protocol for patient’s suffering from a chronic weakness of the sixth nerve, it would appear from the previously mentioned studies that a staged approach to correction is warranted. Prior to treatment, saccadic velocity measurements and forced duction testing should be used to determine the presence of a sixth nerve palsy or paresis. If there is a true palsy, with no activity of the lateral rectus muscle, then it is doubtful that botulinum A toxin injection will be of use. Should a sixth nerve paresis be uncovered, then initial treatment should consist of injection of botulinum A toxin to the ipsilateral medial rectus muscle, followed by additional injections as warranted. This should be sufficient treatment for approximately 35% of the affected patients (7 of 22 patients in the study by Repka et al, and 5 of 11 patients in the study by Biglan et al). The remaining patients should then undergo adjustable vertical rectus muscle transposition surgery as described by Laby and Rosenbaum. This surgical technique will allow the correction of any induced vertical deviation created by the transposition surgery itself, in addition to any persistent vertical deviation created by the spread of botulinum A toxin to the adjacent vertical rectus muscles. The adjustable transposition surgery also allows for resolution of any overcorrection produced by the combination of chemodenervation followed by the transposition. By using a stepped approach, a significant number of patients can be spared an invasive surgical procedure, while those requiring surgical correction can benefit from the increased effectiveness of transposition surgery following injection of botulinum A toxin.

REFERENCES

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LETTERS TO THE EDITOR

REPLY

Drs Laby and Rosenbaum have made a number of excellent observations about our article, "The Efficacy of Botulinum Neurotoxin A for the Treatment of Complete and Partially Recovered Chronic Sixth Nerve Palsy". They noted that some of our patients had residual abduction, and thus represented sixth nerve pareses. As indicated in our manuscript, the patients we studied initially had complete sixth nerve palsies, nearly all from structural causes. Some patients did recover some abduction, thus they were termed "partially recovered." The patients had ceased demonstrating improvement in abduction and each patient was left with a large esodeviation. The level of residual impairment was quantified with an arc perimeter to measure the amplitude of abduction. We did not perform saccadic velocity studies on our patients. All patients did undergo forced duction testing, which documented that there was no restriction of abduction. In addition, the nature of the onset and etiology of the sixth nerve palsy helps to eliminate restriction as a cause for abduction weakness.

The correspondents speculated that the injection of the medial rectus muscle with botulinum neurotoxin A may predispose the patient to a consecutive exotropia following eventual transposition surgery. In the 15 patients in this study who required surgical correction, there has been no patient with exotropia to date.

The development of a rational treatment protocol for chronic sixth nerve palsies and pareses is laudable. I, like most physicians, suspected that a complete abduction deficiency would mean that botulinum neurotoxin A injection alone could not effectively treat the strabismus. However, 3 of the 11 patients with poor abduction in this study (range of abduction = -35 to +10) responded to injection alone without the requirement for surgical intervention. Further, there were no complications evident from this procedure. Whether the injection makes a positive or negative impact on the ultimate outcome for those patients who eventually require surgery is unknown. In the absence of a clinical trial of botulinum treatment for complete sixth nerve palsy and partially recovered sixth nerve palsy, the proper treatment algorithm is unknown. I believe that in light of the benign nature of medial rectus chemodenervation and the medically significant causes of sixth nerve palsy in our study, despite only a 27% success rate, such therapy should be considered a primary therapy before performing more invasive procedures.

REFERENCES

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Pan-American Association of Ophthalmology

Announces $10,000 Troutman-Veronneau Prize

The Pan-American Association of Ophthalmology (PAAO) announced that a prize of $10,000, funded by the Micorsurgical Research Foundation (MRF), will be awarded at the XX Pan-American Congress of Ophthalmology, June 25-29, 1995, in Quito, Ecuador.

The prize will be awarded for the most original previously unpublished clinical experimental work on the subject of Strabismus and Amblyopia and/or Strabismus Microsurgery. The awardee will be a featured speaker at the XX Pan-American Congress in Quito, Equador.

The awardee must be:
- 45 years of age or younger at the time of submission of his or her paper
- Be or become a PAAO active member (miembro titular)
- Be certified by the American Board of Ophthalmology or be Board eligible, including fellows
- Be in good standing in his for her national society affiliated with the PAAO

The deadline for submission of papers is December 31, 1994. Five (5) copies of the paper must be submitted. Papers may be written in English, Portuguese or Spanish. Submissions should be directed to the PAAO Administrative Office, 1301 South Bowen Road, Suite 365, Arlington, Texas, 76013, U.S.A. For further information, contact the Administrative Office at the above address or by telephone (817) 265-2831, or fax (817) 275-3961.