Critical Review: The Effectiveness of Botulinum Toxin as Treatment for Drooling among Patients with Parkinson's Disease.

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This critical review examines the effectiveness of botulinum toxin as treatment for drooling among patients with Parkinson's disease. Studies using within-subjects experimental designs and randomized controlled trials were analyzed to determine the effects of botulinum toxin on drooling associated with Parkinson's disease. Overall, the literature supports the use of botulinum toxin for treatment of drooling among patients with Parkinson's disease.

Introduction

Parkinson's disease (PD) is a progressive idiopathic neurological disease that affects approximately 50 people per 100,000 over the age of 50 with the average age of onset being 55 years (Duffy, 2005). Parkinson's disease is caused by deterioration of the dopamine producing neurons in the brain stem and basal ganglia, particularly in the substantia nigra (Duffy, 2005). The major symptoms of PD include rest tremor, akinesia, rigidity, and loss of postural reflexes.

Dysphagia is a common symptom of PD with different types of swallowing difficulties corresponding to different stages of the disease. Sialorrhea, or drooling, is one swallowing-related difficulty that affects approximately 75% of all patients with PD (Proulx et al., 2005). It is believed that drooling in patients with PD is a result of swallowing dysfunction, specifically saliva pooling in the mouth due to reduced swallow frequency, not increased saliva production (Marks, 2001). It is thought that the head down posture characteristic of PD, along with reduced oral motor control and decreased awareness, contribute to drooling. Drooling of saliva can result in aspiration, chest infections, angular chelitis due to candidal infection, speech problems, and psychosocial issues for patients and caregivers. In addition, drooling has been related to embarrassment, reduced social interaction, and decreased quality of life (Dogu et al, 2004). Some patieicultyad

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transitory swallowing difficulties. Overall, Lagalla et al. (2006) concluded that botox injections can be considered an effective treatment for drooling associated with PD. Based on the critical appraisal this article provides strong evidence for the use of botox as treatment for drooling associated with PD.

Mancini et al. (2003) describe a double-blind RCT study of 20 patients (10 control; 10 treatment) with PD (n=14) or Multiple System Atrophy (n=6) and presence of drooling in which botox injections were compared with a placebo in the management of drooling associated with parkinsonism. Amount7(l)0.356603(i)0.356603(n)-7(g)5.07202( )-3.5012(a)-2.64358(s)2.71284(s)2.71284(o)-7(0)-7(3)-7())7.0701
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Mancini et al. (2003) and Lipp et al. (2003) included patients with PD as well as patients with other diseases in their studies. This was appropriate as the purpose of both studies was to assess the efficacy of botox on drooling in general, not within a certain population.

case in this study (i.e. some patients followed for three months and some for six months).

Marks et al. (2001) did not appear to use any statistical tests to analyze the data. Raw data was provided for the subjective drooling rating scale; however, no data was provided from the objective measurement of stimulated saliva flow. Based on the information in the article, it is unclear whether or not the differences in drooling observed between the groups were significant. A two-way analysis of variance (ANOVA) for repeated measures could have been used in this case to test both within-subject and between subject changes in outcome measures.

Recommendations

It is recommend that botox injections should be used in clinical practice for treatment of drooling among patients with PD. All six studies, despite some methodological flaws, provide support for the use of botox injections among this population.

Future research should involve more double-blind RCT design studies as this type of study is generally considered the strongest form of empirical evidence. Future studies should also be limited to patients with PD in order to determine the effects of botox injections among this population.

Further study of standardized procedures, botox injections compared with other treatments, long-term side-effects related to botox injections, and the lowest effective dose would serve to enhance the evidence for the use of botox as treatment for drooling associated with PD. The development of a best practice protocol for the use of botox as treatment for drooling among patients with PD would also be beneficial if this treatment is to be used clinically.

Conclusions

Based on the above critical analysis, botulinum toxin should be used in the treatment of drooling among patients with PD. Further research is needed to determine the most effective procedures to be used in a clinical setting.

References

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