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Letter to Editor

Comment on effects of botulinum toxin type A on mood and cognitive function in patients with Parkinson's disease and depression

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With great interest, we have taken note of the recent article by Zhu et al. in which the authors show non-inferiority of facial botulinum toxin injections to oral treatment with sertraline in patients with Parkinson's disease suffering from comorbid depression [1].

This study adds a relevant piece of evidence to accumulating literature supporting an antidepressant effect of botulinum toxin and is the first to investigate botulinum toxin in direct comparison to an established antidepressant drug. However, the significance of this study is limited by the circumstance that, as far as we know, there are no randomized placebo-controlled trials of sertraline in depression specifically associated with Parkinson's disease, although sertraline may be regarded as a first line antidepressant option in this indication [2].

Moreover, Parkinson's disease is a condition in which facial feedback and body feedback mechanisms in general may be particularly relevant for the pathogenesis and treatment of depression. Depression is frequent in Parkinson's disease, and it is possible that altered proprioceptive afferences from the hypomimic, but probably hypertonic facial musculature contribute to the development and maintenance of depressed mood [3]. Against this background, facial botulinum toxin injections may have a high potential as an antidepressant in Parkinsonian patients. Hence, a trial of onabotulinumtoxinA for depression in Parkinson's disease had been started (NCT03069911). Unfortunately, it was terminated early, because it was not possible to recruit the required participants.

The injection scheme Zhu et al. used differs from the one in previous trials of botulinum toxin as a treatment for depression: In most of these trials, botulinum toxin was injected exclusively in the glabellar region with injections into the procerus and the medial and lateral proportions of the corrugator muscles [e.g. 4]. Zhu et al. spared the later proportion of the corrugator muscles, but injected the frontalis and the orbicularis oculi muscles, too. With the presumably incomplete relaxation of a key muscle of the expression of negative emotions (corrugator) and instead relaxation of muscles involved in the expression of positive emotions (orbicularis) they may not be able to exploit the maximum potential of improving mood through facial feedback mechanisms.

Regrettably, the authors do not refer to any of the published randomized controlled trials and meta-analyses showing an antidepressant effect of botulinum toxin [e.g. 4]. Instead, they cite articles hardly, if at all, suitable to support an antidepressant effect of botulinum toxin injections [references 8, 9, 10, 22, 23, 26 in 1].

However, the promising results of the study warrant further research into the use of facial botulinum toxin injections as a treatment for depression in Parkinson's disease.

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