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Comparing the effect of intensive conventional intervention versus modified constraint-induced movement therapy in stroke patients with upper extremity spasticity following a botulinum-a toxin injection: A randomized controlled trial

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Introduction: Stroke, the second leading cause of mortality around the globe is also one of the main causes of adult disability, which significantly decrease their quality of life. Thus, it attracted various intense researches to overcome this issue and culminated in development of therapeutic approaches. Botulinum-A toxin injection combined with other rehabilitation method such as modified constraint-induced movement therapy (BTX-mCIMT) emerged as highly promising intervention for stroke therapy. This is ascribed to achieving faster functions restoration, better toleration, and prompt efficiency. It should be noticed that, the BTX-mCIMT and Botulinum-A toxin injection intensive conventional intervention (BTX-T) comparison has not been systematically highlighted previously in the literature. In pursuit of this aim, the present study is dedicated to compare between the BTX-CIMT and BTX-T in post stroke patients.

Objective: The present study is dedicated to determining whether there are any differences in therapeutic effects of BTX-mCIMT and BTX-T on stroke patients with upper extremity impairment, to explore the best way to facilitate motor recovery in stroke.

Methods: 58 cases of stroke were recruited from department of rehabilitation center of the first hospital of Jilin University from February 2014 to November 2016, the age was between 10 and 70 years old, onset time from 2 weeks to 12 months. Total 32 participants met the inclusion criteria, then all of them had the injection of BTX-A. Later, they were randomly divided into two groups: intensive conventional rehabilitation therapy (BTX-T), and modified constraint-induced movement therapy group (BTX-mCIMT). Both groups had the therapy for 1 hour a day, 5 days a week and for 4 weeks. Motor function was assessed by the modified Ashworth scale (MAS), Fugl-Meyer Assessment of the upper extremity (FMA), and Barthel index (BI) before treatment and 4 weeks after treatment.

Results: After 4-week treatment, both groups revealed a significant improvement in MAS, FMA and BI score compared with pre-treatment's ($p<0.05$). BTX-mCIMT group possessed a noteworthy higher mean score in FMA and BI (the mean score of 52 and 77.6 respectively) than BTX-T group's (the mean score of 37.5 and 70 respectively) ($P<0.05$) at the end of 4 weeks' treatment, however, no significant statistical difference was seen in MAS score ($P>0.05$).

Conclusion: Both BTX-mCIMT and BTX-T can facilitate motor function recovery in stroke. Compared with BTX-T, BTX-mCIMT shows better curative effects on motor function recovery and daily living ability.

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