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Comparing the effects of modified constraint-induced movement therapy and intensive conventional therapy on upper-limb motor function recovery after botulinum-a toxin injection in stroke

M.Nasb

Department of Rehabilitation Medicine and physical therapy, Tongji Hospital, Huazhong University of Science and Technology, Wuhan, PR China

Background: Stroke is not only the second leading cause of mortality around the globe, but also one of the main causes of adult disability. Many studies have suggested that the combination technique therapies showed better outcomes compared with single approach. Botulinum-A toxin injection combined with other rehabilitation method such as modified constraint-induced movement therapy (BTX-CIMT) emerged as highly promising intervention for motor recovery post-stroke.

Objective: Herein we aim to investigate whether administrate a higher dose of conventional intervention combined with BTX (BTX-ICT)can emulate the effectiveness of BTX-CIMT on improving motor recovery along with reducing spasticity of upper limb in stroke patients.

Methods: Evaluator blinded randomized controlled trial conducted between February 2014 to November 2016 among 58 stroke patients aged 10 to 70 years, patients were allocated into two groups: the intensive conventional rehabilitation, and modified constraint-induced movement therapy. Both groups had their modified Ashworth scale (MAS), Fugl-Meyer (FMA) and Barthel index assessment (BI) before injection and at 4 weeks post-injection.

Results: After 4-week treatment, both groups revealed a significant improvement in MAS, FMA and BI score compared with pre-treatment score ($P<0.05$). BTX-mCIMT group possessed a noteworthy higher mean score in FMA and BI than BTX-ICT group's at the end of 4 weeks' treatment ($P<0.05$). However, no significant statistical difference was noticed in MAS score ($P > 0.05$).

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

Key words: Rehabilitation, physical therapy, Botulinum toxin, Constraint-induced movement therapy, Spasticity, Stroke, Upper extremity