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A Scoping Review on the Leading Interventions of Upper Limb Rehabilitation in Cerebral Palsy

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Abstract

Motor impairment in children with spastic hemiparetic cerebral palsy (CP) is generally more prominent in the affected upper limb, leading to limitations in hand function as muscle weakness, slower execution of movements and deficient integration of sensory-motor information. The aim of the proposed study is to perform a comparative analysis of functional training effects for the paretic upper limb with and without transcranial direct current stimulation (tDCS) over the primary motor cortex in children with spastic hemiparetic cerebral palsy. The purpose of the project is to outline the specific methods and procedures and to determine whether a single or combined effects with other interventions of tDCS is effective. Subjects of age group (5-28) years who were spastic hemiparetic were included in the study. The design of the study is review. Google scholar, PubMed, Science Direct and Cochrane Library were systemically searched between January 2013 to January 2023 in which children were affected with cerebral palsy and that in which we included only spastic hemiparetic, unilaterally affected patients. Total of 10 articles were included based on the inclusion criteria in there were total 245 children. Children in both the groups were studied intensively. The result turns out to be the group who received Transcutaneous electrical nerve stimulation (TENS), Transcranial magnetic stimulation (TMS) and Electrical Stimulation were at much benefit. Furthermore, the effect of anodal tDCS showed greater improvement than cathodal tDCS. In conclusion, greater improvement was seen in the patients who received anodal tDCS but for a very small duration. Though the combination of tDCS with other interventions is shown to be more beneficial but more research on the effect of the tDCS alone we are looking forward to. This study can be helpful in determining the effect of the leading intervention among other electrical interventions in decreasing muscle duration and re-education time and is considered helpful in the vocational aspect and their activities of daily living (ADL) in CP patients.

Keywords: *Electrotherapy, upper limb, cerebral palsy, tDCS, spastic, hemiparetic.*