INPLASY PROTOCOL

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Review Stage at time of this submission: The review has not yet started.

Conflicts of interest:
There is no conflict of interest to declare.

Neuromuscular interventions in improving upper extremity functions in post-stroke subjects - A systematic review

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Review question / Objective: Are neuromuscular interventions effective in improving upper extremity functions among stroke survivors?

Condition being studied: Stroke is considered to be one of the leading causes of death and disability. It occurs due to a sudden lack of oxygen either due to occlusion or rupture of blood vessels supplying to the brain. It affects motor, sensory, cognitive skills, functional balance and leads to lethal secondary impairments. A stroke can occur at younger ages it affects their active contribution towards the socio-economy of their respective country. Upper extremity function is considered to be one of the primary goals to be attained for independent function and to lead a quality life in stroke survivors.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 August 2020 and was last updated on 17 August 2020 (registration number INPLASY202080070).

INTRODUCTION

Review question / Objective: Are neuromuscular interventions effective in improving upper extremity functions among stroke survivors?

Rationale: The current review is aimed at delineating the effect of these neuromuscular interventions on improving upper extremity functions in post-stroke subjects. It helps the stakeholders to understand the effect of specific techniques, dosage, and the body

component to be focused at a particular recovery stage of stroke.

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METHODS

Search strategy: We planned to search the appropriate studies in Cochrane digital library, PubMed, Medline, Embase and Pedro databases using keywords stroke, functions, upper extremity functions, dexterity, grip strength, spasticity, neuromuscular intervention techniques, Neurodevelopmental therapy (NDT/Bobath), Proprioceptive neuromuscular facilitation (PNF), Constrained induced movement therapy (CIMT), Motor relearning program (MRP), motor learning techniques, Bilateral upper extremity training, Repetitive task training, Mirror therapy, and Mental practice. We intend to include studies published in English.

Participant or population: We will include acute, sub-acute and chronic post stroke subjects with age above 18 years.

Intervention: Neuro muscular interventions (Neuro developmental therapy, Proprioceptive neuro muscular facilitation, Constrained induced movement therapy, Motor relearning program, Bilateral upper extremity training, Repetitive task training, Mirror therapy and Mental practice.

Comparator: Compared with control group (another neuromuscular interventions or physiotherapy approaches or techniques or

(conventional physiotherapy or placebo/no treatment).

Study designs to be included: Randomised Controlled Trials.

Eligibility criteria: A randomised control trails (RCT's) on neuro muscular interventions improving upper extremity functions in stroke population will be included. We will exclude studies on interventions which utilise any kind of assistive devices and quasi experimental studies.

Information sources: Cochrane digital library, PubMed, Medline, Embase, and Pedro databases.

Main outcome(s): upper extremity functions among stroke survivors.

Additional outcome(s): The additional outcome measures will be summarised after systematically reviewing the included randomized control trials.

Data management: The data will be yield from the included RCTs for demographic characteristics, methodology, interventions, outcome measures, results and risk of bias by two independent reviewers any discrepancies between them will be referred to the third reviewer. Data will be extracted and stored in Revman 5.3 software using the non-chochrane mode.

Quality assessment / Risk of bias analysis: Pedro scale and TIDieR (Template for intervention description and replication) will be used for quality assessment and to report intervention respectively. Risk of bias will be assessed by two independent reviewers any differences between them will be sorted by the third reviewer.

Strategy of data synthesis: A simple systematic review will be performed to depict the results if we find a great amount of heterogeneity among the included studies (I2 >70%). Statistical analysis will be performed using Revman 5.3 if meta-analysis is possible. If the included studies show significant heterogeneity, we will use

a random effect model if not we will perform a fixed-effect model.

Subgroup analysis: Subgroup analysis will be done based on type of stroke, chronicity of stroke, concepts behind neuromuscular interventions (neurophysiology, motor learning, repetitive task training, mirror neurons, and motor imagery) duration of the treatment, body part focused and outcome measure.

Sensibility analysis: Sensitivity will be assessed considering the following attributes: (a) random allocation, (b) concealed allocation, (c) methodological quality, (d) blinding of participants, (e) therapists blinding, (f) outcomes assessor blinding, (g) intention to treat analysis, and (h) dropouts.

Language: English.

Country(ies) involved: Saudi Arabia.

Other relevant information: Treatment effects for continuous data will be detailed through the mean difference(if the outcome measures were measured using same scale) or through standardized mean difference (if the outcome measures were measured using different scales) at 95% confidence intervals (95% CI), and if outcomes are dichotomous it will be reported through risk differences and 95% CI.

Keywords: Stroke, Neuromuscular interventions, upper extremity functions, systematic review.

Contributions of each author:
Author 1 - Kumar Gular - Framing objectives and methodology, Data extracting, analyzing the results and drafting the manuscript.
Author 2 - Viwanathan S - Searching relevant articles, reviewing the articles and performing statistical analysis.
Author 3 - Khalid A. Alahmari - Searching relevant articles, reviewing the articles, performing risk of bias assessment and sensitivity.

Author 4 - Jaya Shanker Tedla - Performing quality assessment of the included studies, writing discussion and approving the final manuscript.