

Evidence of rehabilitation therapy in task-specific focal dystonia: A systematic review

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BACKGROUND

Task-specific dystonias (TSD) are primary focal dystonias characterized by excessive muscle contractions producing abnormal painless postures during selective motor activities that often involve highly skilled, repetitive movements. The most common subtypes are writer's cramp and musician's dystonia, but the disorder can affect the performance of any skill. Based on the idea of excessive motor excitability and aberrant sensorimotor integration in the pathophysiology of task-specific dystonia, sensorimotor retraining as a rehabilitation technique may hold promise. The purpose of this systematic review was to investigate the available evidence about the role of rehabilitation therapy as a treatment for task-specific dystonia.

RESULTS

Twenty-one studies were included for qualitative synthesis: the PRISMA flow diagram (figure) illustrates the study selection process. Most of the reports are small single group pre-/post-test study designs with a variability in the type of task-specific dystonia and the type of evaluated outcome measures.

The different rehabilitation interventions were grouped into six categories based upon the underlying theoretical basis of different approaches:

- 1) Movement practice (consists of intensive motor training to restore the voluntary control of the affected body part);
- 2) Training with constraint (implies constraint of compensatory movements in the unaffected joints or prevention of involuntary movements of the affected joints during motor training);
- 3) Sensory reorganization (focuses on the reorganization of the sensory cortical map to induce motor improvements);
- 4) Biofeedback training (external methods or devices are used to provide feedback on the degree of muscle activation);
- 5) Neuromodulation in combination with sensorimotor training (the use of neuromodulation techniques combined with rehabilitation to alter brain excitability and recover voluntary control);
- 6) Compensatory strategies (interventions that focus on the use of compensatory or new movement strategies to replace the abnormal motor programs and thus improve motor function)

DISCUSSION

This review systematically investigated all available evidence about the role of rehabilitation as a treatment for task-specific dystonia (TSD). A recommendation can be made in favor of constraint training, motor training with or without neuromodulation and sensory discriminative training for the treatment of TSD. Different studies have shown that a sufficiently long period of rehabilitation is needed in order to achieve improvement.

No definitive conclusions can be drawn as further prospective multicenter research trials are needed with large study populations, clearly defined inclusion- and exclusion criteria, standardized outcome parameters with multiple baseline- and repeated follow-up over a sufficiently long follow-up period.

While awaiting the results of these trials, rehabilitation for task-specific dystonia can be advocated.

METHODS AND FINDINGS

A systematic review was performed of studies identified through Pubmed and Embase in a structured search strategy by independent author screening. The review was written following the template from the online Cochrane Handbook of Systematic Reviews of Interventions. Additionally the PRISMA statement was strictly followed in reporting this review. The PICO format (Patient/Population: Patients with task-specific dystonia, Intervention/Indicator: Sensorimotor Rehabilitation, Comparison/Control: None/Intervention other than rehabilitation and Outcome: Pre- and post-intervention functional dystonia parameters) for clinical questions was developed. The JBI (Joanna Briggs Institute) Critical Appraisal Checklist and RoB 2 were used to evaluate their methodological quality.

REFERENCES

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PRISMA flow diagram

