OPTIMIZING UPPER LIMB FUNCTION IN CEREBRAL PALSY: A REVIEW OF EVIDENCE ON CONSTRAINT-INDUCED MOVEMENT THERAPY

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Background and Aims

erebral palsy (CP) is a leading cause of motor disability in childhood, frequently affecting upper limb function, particularly in unilateral presentations. Constraint-Induced Movement Therapy (CIMT), which involves constraining the unaffected limb to encourage use of the affected one, has emerged as a promising intervention. This review aims to summarize current evidence on the effectiveness, optimal dosage, and comparative benefits of CIMT in children with CP.

Methods

A literature review was conducted based on recent systematic reviews and meta-analyses identified through PubMed and academic databases. The included studies evaluated CIMT in children with hemiplegic CP, focusing on functional outcomes, dosage, age-related effects, and comparisons with alternative interventions such as bimanual therapy.

Results

Evidence consistently supports CIMT as an effective strategy to improve upper limb function and participation in children with unilateral CP. Meta-analyses demonstrate moderate effect sizes, particularly when therapy is delivered in natural settings or with caregiver involvement. CIMT was shown to be as effective as bimanual intensive therapy, although neither intervention demonstrated clear superiority. Optimal dosage appears to be between 30–60 hours, with no significant association found between treatment duration or age and effectiveness. Modified versions of CIMT (mCIMT) also showed benefit, and early implementation (infants and toddlers) is feasible when paired with structured, engaging environments.

Conclusion

CIMT is an evidence-based intervention for improving upper limb activity and functional use in children with unilateral cerebral palsy. While it is not clearly superior to other high-intensity therapies, it offers comparable outcomes and may be particularly effective when integrated into the child's everyday environment. Further high-quality studies are needed to refine treatment protocols, determine long-term outcomes, and explore patient-specific predictors of response.

Keywords: Pediatric Rehabilitation, Neuroplasticity, CIMT