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Journal Article Digest Sub-Committee

Article Title
Effect of a 10-Week Aquatic Exercise Training Program on Gross Motor Function in Children with Spastic Cerebral Palsy

Article Citation
Akinola, B. I., Gbiri, C. A., & Odebiyi, D. O. (2019). Effect of a 10-Week Aquatic Exercise Training Program on Gross Motor Function in Children With Spastic Cerebral Palsy. *Global pediatric health*, *6*, 2333794X19857378. https://doi.org/10.1177/2333794X19857378

Adaptive Sport/Recreation Categories
- Cerebral Palsy
- Gross Motor Function
- Aquatic Exercise Program

Study Type: Randomized controlled trial

Summary
Thirty participants aged 1 to 12 years with spastic cerebral palsy GMFCS II – V were randomized to experimental or control groups in which they received the same manual passive stretching and functional training exercises for 1 hour 40 minutes twice per week either in water (experimental group) or on land (control group). Gross motor function was assessed using the Gross Motor Function Measure (GMFM-88) at baseline, 4 weeks, 8 weeks, and 10 weeks of intervention. Only the experimental group with the aquatic training demonstrated significant improvement in all dimensions of the gross motor function except for one category (walking, running, and jumping), suggesting that aquatic exercise is an effective means of functional rehabilitation for this population.

Article Strengths
- The study compared the efficacy of the same training program when performed in the water versus on land. It was verified that participants did not participate in other forms of treatment throughout the study period.
- Benefits of the aquatic training program were observed with low dosage of treatment (two training sessions per week for a period of 10 weeks).
- Both programs had 100% attendance.
- The GMFM-88 assessment is a reliable and validated measure, and administration was blinded.

Article Weaknesses
- Small sample size of 30 participants (15 experimental, 15 control).
- Participant demographics were not clearly defined.
- Both programs required a 2 therapist: 1 participant ratio, which may not be deliverable in many centers.

- The study was limited to individuals 12 years of age and under with spastic cerebral palsy, which limits generalizability. Furthermore, although GMFCS levels II – V were included, the majority of participants were GMFCS levels III and IV.
- GMFM-88 was the only outcome measure reported for the study despite authors stating spasticity was also assessed in statistical analysis.
- Specific inclusion and exclusion criteria were not clearly described.
- Randomization methods were not described.
- The authors mentioned that the use of antispastic drugs was discouraged throughout the study, but it was not discussed how well this was enforced.
- The program was not described in enough detail to be reproduced (e.g. functional training involved positions such as standing, but no activities were specifically outlined).
- The mean rank changes in GMFM-88 scores were not provided for the control group for comparison.
- While the between group differences on the GMFM-88 were statistically significant after 10 weeks of intervention, the extent to which these changes in gross motor function are clinically relevant and relate to everyday functioning is unclear.
- There were no assessments after cessation of the exercise training program to assess whether there was carryover of gross motor function improvements.

Take Home Messages

- An aquatic exercise program performed by children with spastic cerebral palsy two times per week for 10 weeks resulted in improved gross motor function, as measured by the GMFM-88, compared to the same exercise program performed on land.
- This study adds to the limited literature on the efficacy of aquatic-based exercise programs in children with spastic cerebral palsy.

Impacts on Clinical Practice:

- An aquatic exercise program may enhance gross motor function outcomes compared to similar exercise programs performed on land for children with cerebral palsy GMFCS II-IV.
- Clinicians may consider that aquatic therapy may be advantageous since water provides buoyancy for weight reduction and decreased forces on joints, which may improve tolerance of exercise activities.