

The Relationship Between Lower Extremity Functional Strength and Aerobic Performance in Youth with Cerebral Palsy (CP)

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Youth with CP have lower aerobic performance levels and increased energy cost of walking compared to their peers. Youth with CP are at a high risk for being overweight, and developing cardiovascular and metabolic disease such as hypertension, dyslipidemia, and metabolic syndrome. Lower extremity extensor strength has been shown to explain 7.5% of the variability in oxygen cost of walking and lower extremity strengthening can improve walking ability in ambulatory youth with CP. **PURPOSE:** To examine the relationship between muscle endurance and aerobic performance in youth with CP. **METHODS:** Eleven (n=11) ambulatory youth with CP aged 9-20 years (M = 15.67, SD = 3.7) were assessed. The sample consists of; 9 males and 3 females, n=7 individuals levels I-II and n=5 level III on the Gross Motor Function Classification System (GMFCS). Seven participants have unilateral CP while five have a bilateral distribution. Functional strength was measured using a 30 second repetition maximum sit to stand test and a 30 repetition maximum second lateral step up test on both lower extremities. Aerobic performance was measured using the shuttle run test for youth with CP at GMFCS levels II and III (SRT-II or SRT-III). Number of shuttles, time to conclusion, test level, total distance, maximum heart rate, and ratings of perceived exertion were recorded. Analysis was completed using a two-tailed Spearman Rank Correlation Coefficient (r_s) because data for shuttle run test total distance were not normally distributed. **RESULTS:** There is a strong positive correlation between repetitions completed on the 30 second sit to stand test and total distance in the SRT-II or SRT-III test ($r_s = .69$, $p < .05$, 95%CI .19-.90). **CONCLUSION:** Results show that functional strength and aerobic performance may influence one another. These findings support research showing a link between strength and aerobic performance in youth with CP; however it is unclear whether the relationship is due to energy cost, walking ability, or some other function.

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