



The Influence of Walking Ability and Distribution of Motor Impairment on Habitual Physical Activity in Children with Cerebral Palsy: A Pilot Study



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BACKGROUND & OBJECTIVES

Children with cerebral palsy (CP) have been described as having sedentary lifestyles.^{1, 2}

Physical activity (PA) has been primarily captured via waist mounted devices with limited information for non-ambulatory children with CP.

In order to capture meaningful PA across functional levels, this pilot study aims to examine wrist worn accelerometry-based habitual PA in children with CP by walking ability and distribution of motor impairment.

STUDY DESIGN

Prospective, observational, cross sectional, cohort study

SAMPLE

N = 52

Children with CP or delays in gross motor development

Average age 7.4 years (4.0 – 11.5)

30 (58%) females

Gross Motor Function Classification Levels I-V (GMFCS)

22 (42%) unilateral motor distribution

33 (64%, p=.05) walkers (GMFCS Level I-III)

Participants were recruited as part of the Activity Participation sub-study of the multi-site, longitudinal ON TRACK Study.

METHODS

Habitual PA was measured by participants wearing a triaxial Actigraph accelerometer on their dominant wrist during all waking hours for a goal of 7 days.



Actigraph data were downloaded for an average of 5.9 [2.2] days, converted to 'waist' counts and processed with Actilife software and published conversion algorithms.³

Average vector magnitude activity counts (VMAC) per min/day was created for PA level and average minutes of moderate to vigorous physical activity (MVPA) per day for intensity of PA.

GMFCS levels and motor distribution were classified by a research therapist during a home study visit.

PA of walkers/non-walkers and unilateral/bilateral motor impairment was examined with the Wilcoxon Sign Rank test.

RESULTS

Participants who walked compared to non-walkers demonstrated:

- Greater VMAC 3303 [1178] vs. 1769 [1202], p < .001) per day
- More minutes MVPA 162.9 [53.4] vs. 39.1 [40.3], p < .001) per day

Participants with unilateral versus those with bilateral motor impairment exhibited:

- higher VMAC 3605 [1125] vs. 2110 [1230], p < .001)
- minutes MVPA (183.4 [38.1] vs 69.5 [61.6], p < .001)



CONCLUSIONS

Walking and unilateral motor impairment were associated with higher levels of habitual PA and intensity.

This is the first documentation of habitual PA for elementary school-aged youth with CP at GMFCS level IV & V.

VMAC results are similar to published ambulatory data.⁴

MVPA results are higher than reported walking/non-walking data⁵, which may be a function of wrist placement.

CLINICAL RELEVANCE

Consider device placement relative walking skill in order to capture ecologically meaningful PA in non-ambulatory children with CP.

Non-walkers appear to have lower habitual PA, with may negatively influence overall health/wellness.

Further work: validate wrist accelerometry as a measure of PA level/intensity in non-ambulatory children with CP.

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