The prevalence of cardiovascular risk factors in adolescents with cerebral palsy: Relationship with daily levels of physical activity

Nai-Yuen Ho, Brian W. Timmons, Maureen J. MacDonald, Audra A. Martin, Stephen Noorduyn, and Jan Willem Gorter (on behalf of the Stay-FIT study group*)

Department of Pediatrics, McMaster University, Hamilton, Canada

INTRODUCTION

- Individuals with lower levels of physical activity are known to be at greater risk of cardiovascular disease (CVD).
- Since risk of CVD in childhood often carries on into adulthood, early identification is important for CVD prevention.
- Cerebral palsy (CP) limits motor function, which is commonly associated with lower participation in physical activity (1, 2).
- No studies have examined the prevalence of CVD risk factors in this population or have correlated them with daily levels of physical activity.

OBJECTIVES

1. To determine the prevalence of select CVD risk factors in ambulatory adolescents with CP.
2. To determine the relationship between levels of physical activity and the prevalence of select CVD risk factors.

METHODS

SUBJECTS

- 7 ambulatory adolescents (2 females, 4 males) aged 9-18 years with CP (Gross Motor Function Classification System Levels I-III) participated.
- Physical activity was monitored over 7 consecutive days using accelerometers attached to the waist.

NOTE: Physical activity was not monitored in one subject.

MEASUREMENT OF CVD RISK FACTORS

- Seated blood pressure was measured using an automated blood pressure cuff.
- Body mass index (BMI) = weight (kg) / height (m)²
  - Weight was measured with street clothes but without shoes.
  - Height was measured against a wall, using anthropometric tape.
- Waist circumference was measured at 4 cm above the umbilical cord, using anthropometric tape.

RESULTS

Table 1. Mean percentiles of body mass index (calculated from armspan) and waist circumference (n=7). Values are means ± SD (range). Blood pressure percentiles were only used to estimate prevalence of CVD risk.

<table>
<thead>
<tr>
<th>CVD risk factor</th>
<th>Percentile</th>
<th>BMI by armspan</th>
<th>Waist circumference</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>44.7 ± 20.7 (19-75)</td>
<td>60.0 ± 29.3 (10-95)</td>
</tr>
</tbody>
</table>

Figure 1. Prevalence of CVD risk factors amongst adolescents with CP (n=7).

Figure 2. Comparison of mean BMI percentiles when using different measures to determine height (n=7). Values are means ± SD. Bars with different letters are significantly different from each other (paired t-test, two-tailed).


table

Figure 3. BMI percentiles using height for different levels of daily physical activity (n=7).

NOTE: Physical activity data for one participant is still being analysed.

METHODOLOGICAL REMARKS

- Adolescents may not be able to stand upright for the measurement of height (H), so surrogate measures were also used:
  - Knee height (KH):
    - MALES: \[ H = 40.54 + 2.22 \times KH \]
    - FEMALES: \[ H = 43.21 + 2.15 \times KH \]
  - Armspan (AS): \[ H = 7.1668 + 0.9225 \times AS \]

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REFERENCES