Physical activity in childhood and the association with myopia in adolescence – The CHAMPS Eye Study

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**Purpose**

• To investigate the effect of physical activity (PA) on the development of myopia in a Danish cohort of schoolchildren

**Design and methods**

• A prospective cohort study with 198 school children.

- Baseline - August to October 2010:
  - PA assessed with GT3X-accelerometer (ActiGraph) worn at least 10 hours/day, minimum 4 days and 1 weekend day.
  - PA measure: mean counts/min
  - Cut off-points for the PA intensity levels:
    - Sedentary (SED) ≤ 100 counts/min
    - Light (L) > 100 counts/min
    - Moderate (M) ≥ 2296 counts/min
    - Vigorous (V) ≥ 4012 counts/min

- Follow-up - March to May 2015:
  - Examination at Department of Ophthalmology, Odense, Denmark, including:
    - Autorefraction in cycloplegia and Keratometry (Tonoref II, Nidek)
    - Biometri (axial length (AL)) (Lenstar LS 900, Haag Streit)

**Results**

- Results are calculated at follow-up
- Mean age was 15.5 years (range 14.2-17.5)
- 50% were male
- Mean axial length: 23.4±0.94mm
- Mean spherical refractive error (RE): +0.69±1.54 diopter (D)
- 11% were myopic (RE ≤ 0.5 D)
- Mean spherical equivalent (SE): 0.5±1.50D
- 15% were myopic (SE ≤ 0.5 D)
- 10% increment in M-PA-time was predictive of a decrease in AL of 1.2 mm (p>0.01) and an increase in SE of 1.50 (p<0.01)
- Each 10% increment in SED-PA prompt a 0.3 mm longer AL (p<0.01) and a -0.4D increment of the SE (P<0.05)

**Conclusion**

• Increased level of physical activity was associated with refractive error and a shorter axial length for sedentary and moderate physical activity, consistent with theory.

**Background**

- Myopia is the most frequent eye disease globally
- Caused by axial growth of the eye during childhood
- Lifestyle changes, reduced physical activity and time spent outdoors are thought to be the driving force behind the rapid increase of myopia worldwide
- This is a sub-study of the Childhood Health, Activity, and Motor Performance Study Denmark (CHAMPS)

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**Commercial relationship**

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