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Myopia prevalence in Canadian school children

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PURPOSE: A pilot study to determine the prevalence of myopia and proportion of uncorrected myopia in Waterloo Region, Ontario, Canada.

METHODS: Automated refraction, subjective refraction, and visual acuity were tested on children ages 6-8 and 11-13 at the 1st study visit. Those with a subjective spherical equivalent refraction (SER) of at least -0.50D in at least one eye attended a 2nd visit, where all tests from visit 1 were repeated after cycloplegia with 2 drops of 1% Tropicamide. Axial length (AL) was measured with IOLMaster (Zeiss), and a child activity questionnaire was completed by parents.

RESULTS: From Dec 2013 to Apr 2015, 166 children completed the study (83 ages 6-8 and 83 ages 11-13). Myopia (SER ≤ -0.50D) prevalence was 17.5% among the overall group, 6.0% among ages 6-8 and 28.9% among ages 11-13. Mean subjective SER in myopic children was -1.10D (95% Confidence Limits[CL]: -0.34 to -1.86D) at ages 6-8, and -2.44D (95% CL: -1.71 to -3.18D) at ages 11-13. In this study, 34.5% of the myopic children were uncorrected, which represented 6.0% of the entire group of children. Mean AL increased by 1.03mm from ages 6-8 (mean 22.62mm; 95% CL: 22.45 to 22.79mm) to ages 11-13 (mean 23.65mm, 95% CL: 23.45 to 23.84mm) ($p < 0.01$). The correlation coefficient between AL and SER was -0.618 ($p < 0.01$). Binary logistic regression between child's outdoor time and incidence of myopia showed that for one additional hour of outdoor time per week, the odds of a child having myopia was lowered by 14.3% ($p = 0.007$).

CONCLUSION: This is the first report of myopia prevalence in a non-clinical population of children in Canada. Myopia prevalence increased from 6% at ages 6-8 to 29% at ages 11-13. The finding that 35% of the myopes in this study were uncorrected suggests more extensive vision screening and eye exams are advisable in these age groups. More time outdoors may be beneficial to protect against myopia onset.

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