Title: Factors associated with myopia in Korean children: Korea National Health and Nutrition Examination Survey 2016–2017 (KNHANES VII)

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Reviewer: Boris Gramatikov

Reviewer's report:

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The purpose of this study was to evaluate the prevalence and risk factors associated with myopia and high myopia in children in South Korea. A total of 983 children (reduced from 1,237) age 5-18 years were evaluated. Myopia and high myopia were defined as a spherical equivalent (SE) ≤-0.5 D) and SE ≤-6.0 D. The association between refractive errors and potential risk factors for myopia was analyzed. Both Ophthalmic examinations and a survey were used. Statistical analyses were performed correctly using the SAS survey procedure, to reflect the complex sampling design and sampling weights of KNHANES, and to provide representative national prevalence estimates. The procedures included unequal probabilities of selection, oversampling, and non-response such that inferences could be made about Korean adult participants. KNHANES sampling was weighted by adjusting for oversampling and nonresponses. Potential risk factors were correctly assessed by subject, not by eye. Age, gender, BMI, presence of parental myopia, time spent on near work activities, household income, and accompanying disease (atopic dermatitis, allergic rhinitis, asthma, sinusitis, otitis media, ADHD, etc., were analyzed as possible risk factors for pediatric myopia using univariate logistic regression. Factors with P<0.2 were simultaneously adjusted in a multivariable logistic regression analysis.

The results are interesting. The mean subject age was 12.2±0.2 years, and mean refractive error was -1.84±2.38. Among all the subjects, 643 (65.4%) had myopia, and 68 (6.9%) had high myopia. In a univariate analysis, the representative value (mean, median) of age and BMI sequentially increased with increased myopia level (non myopia - low myopia - high myopia), and was statistically significant (P<0.001). Not surprisingly, the participants with parental myopia (P=0.016) and increased time spent on near work activities (P=0.033) had increased risk of myopia in a similar manner. Prior histories of accompanying disease, such as atopic dermatitis or sinusitis, as diagnosed by a doctor, were also found to be possible factors influencing the development of pediatric myopia. These are interesting observations. In the adjusted multivariate model, older age and parental myopia were significantly associated with myopia. Not surprisingly, yet worth publishing. According to this analysis, 1 additional year of age was associated with a 1.27-fold higher risk for myopia, and a 1.44-fold higher risk for high myopia, compared with children 1 year younger. In a similar manner, children with myopic parents had
1.84-fold greater risk for myopia and 3.48-fold greater risk for high myopia than children without myopic parents. Higher BMI was significantly associated with high myopia. Although the effect of BMI on development of myopia is still controversial, the authors offer reasonable comment on that in the Discussion section, giving also reference to other studies from the literature.

The authors candidly admit that there are several limitations in this study. For example, refractive errors were not evaluated under cycloplegic conditions, which could bias the results in younger subjects, who tended to have a more active accommodative response than older subjects. Also, the KNHANES is a cross-sectional study, so the results cannot guarantee a causal relationship.

The conclusion is correct, and indeed, further studies are required to reveal causal relationships.

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Yes

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