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A comparison of dietary intake of children/adolescents with and without myopia

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Myopia is caused by an eye which has grown too long. The prevalence of myopia has increased drastically in recent years and half of the world's population is expected to be myopic by 2050.[(1)] Consequently, a significant increase in sight threatening diseases will follow.[(1)] Myopia most commonly develops in youth, and we now know that environmental factors affect its development. Nutritional status strongly influences growth and development, including that of the eye. It has been hypothesised, therefore, that nutrition may play a role in this excessive eye growth. Current findings are conflicted, with a clear gap in the evidence.[(2,3)] Therefore, the aim of this study is to examine differences in dietary intake of myopic and non-myopic Irish children/adolescents, and identify any potential relationship between macro and/or micronutrient intake and myopia.

A hundred healthy children/adolescents aged 6–16 years were recruited into the study, seventy myopes and thirty non-myopes. Each participant was asked to complete two 24hr diet recalls online, using the 'INTAKE24' software. Spherical equivalent refraction was measured by non-cycloplegic auto refraction. Myopia was defined as ≤-1.00 dioptres [D]. Energy mis-reporters were identified using Goldberg et al cut-offs. Descriptive analysis was preformed using SAS (Version 9.4). Nutrient intakes were reported as medians and interquartile range, as they were not normally distributed. Dietary data was log transformed, and the residual method was used to adjust for energy intake. Multivariate logistic regression was carried out to examine any potential relationships between nutrient intake and myopia.

Both the myopic and non-myopic groups had similar energy, protein, carbohydrate and total fat intake. However, the non-myopes had a significantly higher intake of vitamin D ($p=<0.01$), retinol ($p = 0.04$), cholesterol ($p = 0.01$) and vitamin B12 ($p = 0.02$). When multivariate logistic regression analysis was performed, vitamin D was the only nutrient to maintain a significant association with myopia, after adjustment for potential confounders [OR 0.18 (95% CI 0.03–0.89) ($p = 0.03$)].

Preliminary results show a statistically significant relationship between dietary vitamin D intake and myopia. Interestingly, previous studies have found an association between vitamin D status and myopia,[(4)] but few have examined dietary intake alone, indicating a potential difference in diets of myopes and non-myopes. This study does have its limitations; the sample size is small, the use of a dietary intake tool is dependent on recall, and data on dietary supplement use was not available. However, given the corroboration of previous findings, further investigation is warranted, perhaps in a larger population with an extended focus on dietary patterns.

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