

Visual acuity and refractive status of Hong Kong Chinese infants in the first year and their relationship with maternal diet during pregnancy

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Purpose: To examine visual acuity (VA) and refraction changes in Hong Kong Chinese infants from 2 to 12 months after birth, and their relationships with maternal diet in the third trimester of pregnancy.

Methods: This is an observational follow-up study of 39 healthy full-term infants who were part of a community-based early nutrition program. VA, spherical equivalent refraction (SER) (Welch Allyn photo-refractor (WA) and retinoscopy (Ret)) and body height were assessed at 2- and 12-months of age. VA and refraction across visits were compared using paired t-test. Maternal diet in the third trimester was recorded using food frequency questionnaire. Its associations with ocular parameters were analysed by linear regression models.

Results: VA improved significantly from 1.64 LogMAR at 2-month to 0.37 LogMAR at 12-month old, with a mean difference of 1.16 ± 0.43 LogMAR ($p < 0.01$). There was no significant difference in SER between the baseline and 12-month visits when using WA (baseline mean 0.66 ± 1.60 D vs 12-months mean 0.58 ± 0.49 D; $p=0.75$) and Ret (baseline mean 0.66 ± 1.82 vs 12-months mean 0.32 ± 0.79 ; $p=0.07$).

Maternal diet of higher saltwater fish EPA and DHA intake were associated with higher hyperopia at 2 months (EPA $p=0.032$; DHA $p=0.007$) and more hyperopic change from 2 to 12 months (EPA $p=0.009$; DHA $p=0.01$). Infants with higher hyperopia at 2 months and more increase in hyperopia at 12 months had shorter body height. There was no significant

relationship between fatty acids intake and baseline VA or the changes in VA across visits.

Conclusion: There were no significant differences in SER across visits. However, hyperopia was significantly less in magnitude when compared to Caucasian counterparts. Mothers with higher saltwater EPA intake had infants who were shorter in height and higher hyperopia at 2 months old. These refractive findings may be as a result of shorter axial length in these shorter infants.