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Protective effects of dietary supplementation with natural omega-3 polyunsaturated fatty acids on the visual acuity of school-age children with lower IQ or attention-deficit hyperactivity disorder

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Objective: Little attention has been paid to the possible protective role of ω -3 polyunsaturated fatty acids (PUFAs) on the visual acuity of school-age children with lower IQs or attention-deficit hyperactivity disorder (ADHD). The aim of this study was to evaluate the effect of dietary ω -3 PUFAs on the visual acuity and red blood cell (RBC) fatty acid compositions of these children.

Methods: We randomly assigned 179 children with lower IQs or ADHD to receive ordinary eggs (control group, n=90) or eggs rich in C18:3 ω -3, eicosapentaenoic acid (EPA, 20:5 ω -3) and docosahexaenoic acid (DHA, 22:6 ω -3) for 3 mo (study group, n=89). Before and after the intervention, distance visual acuity was tested using an E chart and the RBC fatty acid composition was determined using capillary gas chromatography.

Results: Three months later, 171 children completed the follow-up with the exception of 8 children who were unavailable during follow-up. Both groups of children showed a significant improvement in visual acuity ($P < 0.05$), however, visual acuity in the study group was significantly better than that of the control group ($P = 0.013$). The C18:3 ω -3 ($P = 0.009$), DHA ($P = 0.009$) and $\Sigma\omega$ -3 ($P = 0.022$) levels of the intervention group were significantly higher than those of the control group, while the C20:4 ω -6 ($P = 0.003$), C22:4 ω -6 ($P = 0.000$), $\Sigma\omega$ -6 ($P = 0.001$), $\Sigma\omega$ -6/ $\Sigma\omega$ -3 ($P = 0.000$) and arachidonic acid/DHA ($P = 0.000$) of the study group were significantly lower than those of the control group. No significant differences in the levels of C18:2 ω -6 ($P = 0.723$), C20:2 ω -6 ($P = 0.249$), C20:3 ω -6 ($P = 0.258$), C20:5 ω -3 ($P = 0.051$) or C22:5 ($P = 0.200$) were found between the two groups.

Conclusions: Dietary supplementation with ω -3 PUFAs improves both visual acuity and the RBC fatty acid profile in school-age children with lower IQs or ADHD.

Biography

Yongmei Peng has completed her MD at 1984 from Shanghai Medical University (SHMU), China and worked as Resident and Vice Professor and Professor in Children's Hospital of SHMU. She came to Shanghai Center for Women and Children's Health as the Vice Director. She has published more than 60 papers in reputed journals.

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