

Risk factors for age-related maculopathy are associated with a relative lack of macular pigment.

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Macular pigment (MP) is composed of the two dietary carotenoids lutein (L) and zeaxanthin (Z), and is believed to protect against age-related maculopathy (ARM). This study was undertaken to investigate MP optical density with respect to risk factors for ARM, in 828 healthy subjects from an Irish population. MP optical density was measured psychophysically using heterochromatic flicker photometry, serum L and Z were quantified by HPLC, and dietary intake of L and Z was assessed using a validated food-frequency questionnaire. Clinical and personal details were also recorded, with particular attention directed towards risk factors for ARM. We report a statistically significant age-related decline in MP optical density ($r^2=0.082$, $p<0.01$). Current and past smokers had lower average MP optical density than never smokers and this difference was statistically significant ($p<0.01$). Subjects with a confirmed family history of ARM had significantly lower levels of MP optical density than subjects with no known family history of disease ($p<0.01$). For each of these established risk factors, their statistically significant negative association with MP persisted after controlling for the other two, and also after controlling for other potentially confounding variables such as sex, cholesterol, dietary and serum L ($p<0.01$). In the absence of retinal pathology, and in advance of disease onset, the relative lack of MP seen in association with increasing age, tobacco use and family history of ARM supports the hypothesis that the enhanced risk that these variables represent for ARM may be attributable, at least in part, to a parallel deficiency of macular carotenoids.

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