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Reducing the Genetic Risk of Age-Related Macular Degeneration With Dietary Antioxidants, Zinc, and {omega}-3 Fatty Acids: The Rotterdam Study.

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Source

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Abstract

OBJECTIVE:

To investigate whether dietary nutrients can reduce the genetic risk of early age-related macular degeneration (AMD) conferred by the genetic variants CFH Y402H and LOC387715 A69S in a nested case-control study.

METHODS:

For 2167 individuals (≥55 years) from the population-based Rotterdam Study at risk of AMD, dietary intake was assessed at baseline using a semiquantitative food frequency questionnaire and genetic variants were determined using TaqMan assay. Incident early AMD was determined on fundus photographs at 3 follow-up visits (median follow-up, 8.6 years). The synergy index was used to evaluate biological interaction between risk factors; hazard ratios were calculated to estimate risk of early AMD in strata of nutrient intake and genotypes.

RESULTS:

Five hundred seventeen participants developed early AMD. Significant synergy indices supported the possibility of biological interaction between CFH Y402H and zinc, β-carotene, lutein/**zeaxanthin**, and

eicosapentaenoic/docosahexaenoic acid (EPA/DHA) and between LOC387715 A69S and zinc and EPA/DHA (all $P < .05$). Homozygotes of CFH Y402H with dietary intake of zinc in the highest tertile reduced their hazard ratio of early AMD from 2.25 to 1.27. For intakes of β -carotene, lutein/**zeaxanthin**, and EPA/DHA, these risk reductions were from 2.54 to 1.47, 2.63 to 1.72, and 1.97 to 1.30, respectively. Carriers of LOC387715 A69S with the highest intake of zinc and EPA/DHA reduced their risk from 1.70 to 1.17 and 1.59 to 0.95, respectively (all P trends $< .05$).

CONCLUSIONS:

High dietary intake of nutrients with antioxidant properties reduces the risk of early AMD in those at high genetic risk. Therefore, clinicians should provide dietary advice to young susceptible individuals to postpone or prevent the vision-disabling consequences of AMD.