

Abstract

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IL-2 and IL-10 gene polymorphisms are associated with respiratory tract infection and may modulate the effect of vitamin E on lower respiratory tract infections in elderly nursing home residents.

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BACKGROUND: Vitamin E supplementation may be a potential strategy to prevent respiratory tract infections (RIs) in the elderly. The efficacy of vitamin E supplementation may depend on individual factors including specific single nucleotide polymorphisms (SNPs) at immunoregulatory genes.

OBJECTIVE: We examined whether the effect of vitamin E on RIs in the elderly was dependent on genetic backgrounds as indicated by SNPs at cytokine genes.

DESIGN: We used data and DNA from a previous vitamin E intervention study (200 IU vitamin E or a placebo daily for 1 y) in elderly nursing home residents to examine vitamin E-gene interactions for incidence of RI. We determined the genotypes of common SNPs at IL-1beta, IL-2, IL-6, IL-10, TNF-alpha, and IFN-gamma in 500 participants. We used negative binomial regression to analyze the association between genotype and incidence of infection.

RESULTS: The effect of vitamin E on lower RI depended on sex and the SNP at IL-10 -819G-->A ($P = 0.03$ for interaction for lower RI). Furthermore, we observed that subjects with the least prevalent genotypes at IL-2 -330A-->C ($P = 0.02$ for upper RI), IL-10 -819G-->A ($P = 0.08$ for upper RI), and IL-10 -1082C-->T ($P < 0.001$ for lower RI in men) had a lower incidence of RI independent of vitamin E supplementation.

CONCLUSIONS: Studies that evaluate the effect of vitamin E on RIs should consider both genetic factors and sex because our results suggest that both may have a significant bearing on the efficacy of vitamin E. Furthermore, common SNPs at cytokine genes may contribute to the individual risk of RIs in the elderly. This trial was registered at clinicaltrials.gov as NCT00758914.

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