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Paraoxonase 1 polymorphisms 172T→A and 584A→G modify the association between serum concentrations of the antioxidant lycopene and bone turnover markers and oxidative stress parameters in women 25-70 years of age.

Mackinnon ES, El-Sohemy A, Rao AV, Rao LG.

Department of Medicine, Division of Endocrinology and Metabolism, St. Michael's Hospital, Toronto, Ont., Canada.

Abstract

BACKGROUND/AIMS: Polymorphisms of the paraoxonase 1 (PON1) enzyme affect the ability to protect LDL from oxidation. Oxidative stress is a risk factor for osteoporosis and antioxidants may be beneficial for prevention. The aim of this study was to determine whether PON1 genotypes modified the association between lycopene and bone turnover markers and oxidative stress parameters.

METHODS: Blood samples from 107 women 25-70 years of age were analyzed for serum carotenoid concentrations, bone-specific alkaline phosphatase (BAP), N-telopeptide of type I collagen (NTx) and oxidative stress parameters. Subjects were genotyped for the 172T→A and 584A→G polymorphisms of PON1.

RESULTS: The 172T→A polymorphism modified the association between lycopene and NTx ($p < 0.05$ for interaction). In the 172TT genotype, high serum lycopene was associated with decreased NTx ($p < 0.05$). The 584A→G polymorphism modified the association between lycopene and BAP ($p < 0.05$ for interaction). Additionally, in participants with the 584GG genotype, high serum lycopene was associated with high TBA-reactive substances ($p < 0.05$).

CONCLUSIONS: These findings show that PON1 polymorphisms modify the association between serum concentrations of lycopene and oxidative stress parameters and bone turnover markers and may, therefore, moderate the risk of osteoporosis.

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