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B-068 - Prospective Associations Between Vitamin D Status, Vitamin DñRelated Gene Polymorphisms, And Risk Of Tobacco-Related Cancers

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Purpose:
Experimental evidence has suggested that vitamin D may be protective against tobacco-related cancers through the inhibition of the formation of tumors induced by tobacco carcinogens. To our knowledge, only one previous epidemiologic study investigated the association between vitamin D status and tobacco-related cancer risk, and no study has focused on vitamin D–related gene polymorphisms. Our objective was to prospectively study the association between plasma 25-hydroxyvitamin D [25(OH)D] concentrations, vitamin D–related gene polymorphisms (VDR, CYP24A1, GC, RXR, CaSR), and risk of tobacco-related cancers.

Methods:
A total of 209 tobacco-related cancers were diagnosed within the SU.VI.MAX (Supplémentation en vitamines et minéraux antioxydants) cohort (1994–2007) and were matched with 418 controls as part of a nested case-control study. Tobacco-related cancers (i.e., cancers for which tobacco is one of the risk factors) included several sites in the respiratory, digestive, reproductive, and urinary systems. Plasma total 25(OH)D concentration and selected gene polymorphisms were assessed on samples obtained at baseline. Conditional logistic regression models were computed.

Results:
A 25(OH)D concentration ≥30ng/mL was associated with reduced risk of tobacco-related cancers ($OR_{\geq 30 vs. <30\ ng/mL}$=0.59 (0.35-0.99); P=0.046). This association was observed in former and current smokers ($OR_{\geq 30 vs. <30\ ng/mL}$=0.43 (0.23-0.84); P=0.01) but not in never smokers (P=0.8). The vitamin D receptor (VDR) FokI AA genotype and retinoid X receptor (RXR) rs7861779 TT genotype were associated with increased risk of tobacco-related cancers.

Conclusions:
In this prospective study, high vitamin D status [25(OH)D concentration ≥30ng/mL] was associated with decreased risk of tobacco-related cancers, especially in smokers. These results, which are supported by mechanistic plausibility, suggest that vitamin D may contribute to the prevention of tobacco-induced cancers in smokers and deserve additional investigation.
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