

Abstract

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Adulthood obesity is positively associated with adipose tissue concentrations of vitamin K and inversely associated with circulating indicators of vitamin K status in men and women.

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BACKGROUND: Increased adiposity is associated with increased storage of several fat-soluble nutrients. However, the extent to which vitamin K is stored in fat and the association between vitamin K status and adiposity are unknown.

OBJECTIVE: Our objectives in this study were to determine whether vitamin K is stored in human adipose tissue and the association between vitamin K status and body fat in older men and women.

METHODS: In study A, the vitamin K concentration of subcutaneous and visceral adipose tissue was quantified in samples taken from 16 gastric bypass patients [13 women, 3 men, age 40 +/- 10 y (mean +/- SD)] using HPLC. In study B, cross-sectional associations between percent body fat (%BF) and circulating measures of vitamin K status were examined in 260 women and 183 men [age = 68 +/- 5 y].

RESULTS: The phylloquinone (K(1)) concentrations in subcutaneous and visceral adipose tissue were 148.2 +/- 71.8 and 175 +/- 112 nmol/kg, respectively, which is higher than the reported concentrations of other organs known to store vitamin K. There was an inverse association between %BF and plasma K(1) in women (P-trend < 0.001). Higher %BF was associated with greater circulating concentrations of uncarboxylated prothrombin, indicative of lower hepatic utilization of vitamin K in both men (P-trend = 0.02) and women (P-trend = 0.002) but not with the percentage of undercarboxylated osteocalcin.

CONCLUSION: Adipose tissue contained high concentrations of vitamin K, and increased adiposity was associated with poorer vitamin K status in older adults. Additional studies are needed to further explore the relationships among body fat, storage of vitamin K in adipose tissue, and implications for vitamin K status and function.

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