B-vitamin intake from diet and supplements and breast cancer risk in middle-aged women: Results from the prospective NutriNet-Santé cohort

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Title: B-vitamin intake from diet and supplements and breast cancer risk in middle-aged women: Results from the prospective NutriNet-Santé cohort

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Body: Experimental studies suggest a protective effect of B-vitamins on breast cancer risk, potentially modulated by alcohol intake. However, epidemiological studies are limited, especially regarding non-folate B-vitamins. Furthermore, few of them included quantitative assessment of supplemental intake. This prospective study aimed at investigating the associations between intakes of B-vitamins (dietary, supplemental, total) and breast cancer risk. 27,853 women aged ≥ 45 y from the NutriNet-Santé cohort (2009-2016) were included, with a median follow-up time of 4.2 years. Dietary data were collected using repeated 24h records. A specific questionnaire assessed dietary supplement use over a 12-month period. A composition database of 8000 supplements was developed. Associations were characterized by multivariable Cox models. 462 incident breast cancers were diagnosed. Dietary ($HR_{Q4vs.Q1}=0.74(0.55,0.99)$, $P\text{-trend}=0.05$), supplemental ($HR_{Q4vs.Q1}=0.61(0.38,0.98)$, $P\text{-trend}=0.05$) and total ($HR_{Q4vs.Q1}=0.67(0.50,0.91)$, $P\text{-trend}=0.01$) pyridoxine intakes were inversely associated with breast cancer risk. Total thiamin intake was borderline inversely associated with breast cancer risk ($HR_{\text{per 1-unit increment}}=0.78(0.61,1.00)$, $P=0.05$). Statistically significant interactions between alcohol consumption and B-vitamin (thiamin, riboflavin, niacin, pantothenic acid, pyridoxine, folate, and cobalamin) supplemental intake were observed, the latter being inversely associated with breast cancer risk in non-to-low alcohol drinkers but not in higher drinkers. This large prospective study, including quantitative assessment of supplemental intake, suggests a potential protective effect of pyridoxine and thiamin on breast cancer risk in middle-aged women.