

Abstract

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Serum B vitamin levels and risk of lung cancer.

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CONTEXT: B vitamins and factors related to 1-carbon metabolism help to maintain DNA integrity and regulate gene expression and may affect cancer risk.

OBJECTIVE: To investigate if 1-carbon metabolism factors are associated with onset of lung cancer.

DESIGN, SETTING, AND PARTICIPANTS: The European Prospective Investigation into Cancer and Nutrition (EPIC) recruited 519,978 participants from 10 countries between 1992 and 2000, of whom 385,747 donated blood. By 2006, 899 lung cancer cases were identified and 1770 control participants were individually matched by country, sex, date of birth, and date of blood collection. Serum levels were measured for 6 factors of 1-carbon metabolism and cotinine.

MAIN OUTCOME MEASURE: Odds ratios (ORs) of lung cancer by serum levels of 4 B vitamins (B(2), B(6), folate [B(9)], and B(12)), methionine, and homocysteine.

RESULTS: Within the entire EPIC cohort, the age-standardized incidence rates of lung cancer (standardized to the world population, aged 35-79 years) were 6.6, 44.9, and 156.1 per 100,000 person-years among never, former, and current smokers for men, respectively. The corresponding incidence rates for women were 7.1, 23.9, and 100.9 per 100,000 person-years, respectively. After accounting for smoking, a lower risk for lung cancer was seen for elevated serum levels of B(6) (fourth vs first quartile OR, 0.44; 95% confidence interval [CI], 0.33-0.60; P for trend <.000001), as well as for serum methionine (fourth vs first quartile OR, 0.52; 95% CI, 0.39-0.69; P for trend <.000001). Similar and consistent decreases in risk were observed in never, former, and current smokers, indicating that results were not due to confounding by smoking. The magnitude of risk was also constant with increasing length of follow-up, indicating that the associations were not explained by preclinical disease. A lower risk was also seen for serum folate (fourth vs first quartile OR, 0.68; 95% CI, 0.51-0.90; P for trend = .001), although this was apparent only for former and current smokers. When participants were classified by median levels of serum methionine and B(6), having above-median levels of both was associated with a lower lung cancer risk overall (OR, 0.41; 95% CI, 0.31-0.54), as well as separately among never (OR, 0.36; 95% CI, 0.18-0.72), former (OR, 0.51; 95% CI, 0.34-0.76), and current smokers (OR, 0.42; 95% CI, 0.27-0.65).

CONCLUSION: Serum levels of vitamin B(6) and methionine were inversely associated with risk of lung cancer.

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