

Body mass index, lifetime smoking intensity and lung cancer risk

Mariam El-Zein¹, Marie-Elise Parent^{1,2,3}, Belinda Nicolau^{1,4}, Anita Koushik^{2,3}, Jack Siemiatycki^{2,3} and Marie-Claude Rousseau^{1,2,3}

¹INRS-Institut Armand-Frappier, Université du Québec, Laval, Québec, Canada

²Department of Social and Preventive Medicine, University of Montreal, Montréal, Québec, Canada

³University of Montreal Hospital Research Centre (CRCHUM), Montréal, Québec, Canada

⁴Faculty of Dentistry, McGill University, Montréal, Québec, Canada

There is as yet no generally accepted explanation for the common finding that low body mass index (BMI) is associated with an increased risk of lung cancer. We investigated this association in a Canadian population-based case-control study (1996–2002) with a particular view to assessing the hypothesis that the observed association was due to residual confounding by smoking. Analyses were based on 1,076 cases and 1,439 controls who provided their height at enrollment and their weight at two points in time, at age 20 and 2 years before enrollment. BMI, in kg/m², was classified into underweight (<18.5), normal (18.5–24.9), overweight (25.0–29.9), and obese (≥30). Smoking history was synthesized into a comprehensive smoking index (CSI) that integrated duration, intensity and time since quitting. Odds ratios (ORs) and 95% confidence intervals (CIs) for BMI-lung cancer associations were estimated, adjusting for CSI as well as several sociodemographic, lifestyle and occupational factors. The normal BMI category was used as the reference. Among those who were underweight at age 20, there was a lower risk of lung cancer (OR = 0.69, 95% CI: 0.50–0.95). Conversely, lung cancer risk was increased among those who were underweight 2 years before enrollment (OR = 2.30, 95% CI: 1.30–4.10). The results were almost identical when stratifying analyses based on smoking history into never/lighter and heavier smokers. The inverse association between recent BMI and lung cancer is unlikely to be largely attributable to residual confounding by smoking. Reverse causality or a true relationship between BMI and lung cancer remain plausible.