Fruits, vegetables and lung cancer risk: a systematic review and meta-analysis

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Abstract

Objective: Lung cancer is the most common cause of cancer deaths. Although tobacco smoking is the main risk factor, diet is thought to play a role in its development. As part of the WCRF-AICR Continuous Update Project, we conducted a systematic review and meta-analysis of prospective studies to assess the dose-response relationship between fruits and vegetable intake, and incidence and mortality for lung cancer.

Methods: We searched PubMed up to December 2014 for relevant prospective studies. We estimated summary relative risks (RRs) and 95% confidence intervals (CIs) for the highest compared to the lowest intakes, conducted dose-response meta-analyses. We examined possible nonlinear associations using restricted cubic splines.

Results: When comparing the highest with the lowest intakes, the summary RR estimates were 0.85(95% CI: 0.77-0.93; 18 studies [n]) for fruit and vegetables, 0.90(95% CI: 0.85-0.96; n=24) for vegetables and 0.82(95% CI: 0.77-0.87; n=28) for fruits. The association with fruit and vegetables intake was marginally significant in current smokers and inverse but not significant in former or never smokers. Significant inverse dose-response associations were observed for fruit and vegetables (RR per 100 g increase: 0.96; 95% CI= 0.94-0.98, I^2 =63.9%, n(studies)=14, N(cases)=9609), vegetables (RR per 100 g: 0.94; 95% CI= 0.89-0.98, I^2 =47.9%, n=19, N=12 563), and fruits (RR per 100 g: 0.92; 95% CI= 0.89-0.95, I^2 =56.8%, n=23, N=14506) for fruits. There was evidence of a non-linear relationship ($p < 0.01$) between fruit and vegetables intake and lung cancer risk showing that no further benefit is obtained when increasing consumption above approximately 600 g per day.

Conclusion: Eliminating tobacco smoking is the best strategy to prevent lung cancer. Although residual confounding by smoking cannot be ruled out, the current evidence from prospective studies is consistent with a role of fruit and vegetables in lung cancer aetiology.