Smoking status and gastric cancer risk: an updated meta-analysis of case-control studies published in the past ten years

Giuseppe La Torre, Giacomina Chiaradia, Francesco Gianfagna, Angelo De Lauretis, Stefania Boccia, Alice Mannocci, and Walter Ricciardi

Institute of Hygiene, Catholic University of Sacred Heart, Rome, Italy

ABSTRACT

Background. A meta-analysis of published studies was performed in order to clarify the risk of gastric cancer associated with cigarette smoking status.

Methods. Eligible studies were all the case-control studies investigating an association between smoking status and gastric cancer published from January 1, 1997, until June 30, 2006. In order to evaluate the quality of the published data, a qualitative scoring of papers was applied. The principal outcome measure was the odds ratio for the risk of gastric cancer associated with the smoking status using a random effects model. Cigarette smoking status was assessed in two ways: ever (current and ex) *versus* never smokers; current *versus* never smokers.

Results. We found a statistically significant result for the association between ever smoking status and gastric cancer risk (OR = 1.48; 95% CI, 1.28-1.71), considering 14,442 cases and 73,918 controls. Moreover, we found an odds ratio of 1.69 for current smoker status in comparison to never smokers (95% CI, 1.35-2.11). Considering only high quality studies, the odds ratio increased by 43% for gastric cancer risk in ever smokers (OR = 1.43; 95% CI, 1.24-1.66; Q = 378.60, P <0.00001; I^2 = 90%) and by 57% in current smokers (OR = 1.57; 95% CI, 1.24-2.01). We also considered separately Caucasians and Asian studies, finding for ever smokers an odds ratio of 1.46 (95% CI, 1.25-1.70; Q = 125.68, P <0.00001; I^2 = 82.5%) and of 1.47 (95% CI, 1.13-1.91; Q = 366.77, P <0.00001; I^2 = 94%), respectively.

Conclusions. From the results of this quantitative meta-analysis, it appears that cigarette smoking has to be considered an important risk factor. The use of qualitative scoring decreases the magnitude of the relationship both for ever and current smoker exposure by 5-12%. Future studies on this topic need to clarify the biological interaction between environmental factors (such as cigarette smoking) and different polymorphisms on gastric cancer.