Single nucleotide polymorphisms (5p15.33, 15q25.1, 6p22.1, 6q27 and 7p15.3) and lung cancer survival in European Prospective Investigation into Cancer and Nutrition (EPIC)

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Background and Aims: The single nucleotide polymorphisms (SNPs) rs402710 (5p15.33), rs16969968 and rs8034191 (15q25.1) have been identified by genome-wide association studies (GWAS) as significant predictors of lung cancer risk (McKay, J.D et. al, 2008; Hung, R.J et al, 2008), while rs4324798 (6p22.1) was previously found to influence survival time in small cell lung cancer (SCLC) patients (Yang et al, 2010).

Methods: Using the same population of one of the original GWAS, we investigated whether the selected SNPs and 31 others (also identified in GWAS) influence survival time in EPIC, assuming an additive model. The effect of each polymorphism on all cause survival was estimated in 1094 lung cancer patients, and lung cancer specific survival in 763 patients, using Cox regression adjusted for a priori confounders and competing causes of death where appropriate.

Results: After 1558 person-years of post-diagnostic follow-up, 874 deaths occurred from all causes, including 690 from lung cancer. In the lung cancer-specific survival analysis (1102 person-years), only rs7452888 (6q27) and rs2710994 (7p15.3) modified survival, with adjusted hazard ratios of 1.19 (P=0.009) and 1.32 (P=0.011) respectively, taking competing risks into account. Weak associations were identified in subgroup analysis for rs16969968 and rs8034191 (15q25.1) and rs342798 (6p22.1) and survival in never-smokers, as well as for rs402710 in current smokers and SCLC patients.

Conclusions: rs402710 (5p15.33), rs16969968 and rs8034191 (both 15q25.1), and rs4324798 (6p22.1) were found to be unrelated to survival times in this large cohort of lung cancer patients, regardless of whether the cause of death was from lung cancer or not. However, rs7452888 (6q27) was identified as a possible candidate SNP to influence lung cancer survival, while stratified analysis had hinted at the possible roles of rs8034191, rs16969968 (15q25.1), and rs4324798 (6p22.1) in determining survival in lung cancer patients who were never-smokers, based on a small sample.

References:

