

Lung cancer risk in subjects exposed to organic dust: an unexpected and surprising story

In a recently published multicentre case-control study evaluating lung cancer risk among subjects exposed to organic dusts,¹ the authors could not confirm the findings from previous reports in which a decreased risk was found among workers in the cotton industry and animal farmers.²

Regarding a decreased risk of lung cancer among cotton workers^{3–7} the authors quite rightly concluded that their material was not suitable to evaluate this relationship as their subgroups did not reflect the critical exposure groups, i.e. those exposed to high levels of endotoxin such as cardroom workers and weavers.⁸

For farmers we believe that the multicentre case-control study findings have the same shortcomings for the following reasons. In the Veneto region of Italy, where the first study reporting a decreased risk of lung cancer among farmers was carried out,⁹ the number of farmers has progressively decreased over the last three decades. People leaving dairy farming have taken employment in industries and services in which the exposure level to organic dusts is low. In a cohort of dairy farmers enrolled in this region, the number of active workers in 1998 was 541 of 5634 (9.6%) workers who reported working in dairy farms sometime during their lifetime.¹⁰ The results in the cohort study suggest an exposure-dependent reduction in the risk of lung cancer for dairy farmers during the observation period 1970–1984, when most subjects were working on their farms, but not during the period 1985–1998 when they presumably had other occupations. A cohort nested case-control study controlling for age and smoking habits confirmed that recent exposure to dairy farm dust protected against lung cancer while this protective effect was no longer present when more than 15 years had elapsed since working on the farm to the end of follow-up or death.¹⁰

Because protection by endotoxin-containing dust seems to diminish over time after the cessation of exposure, the increased risk of lung cancer reported in the multicentre case-control study would presumably be an effect of other exposures, as shown by the association between occupational exposure to diesel exhaust and lung cancer which has recently been reported in the same set of cases and controls.¹¹ Moreover in a European Community Respiratory Health Survey, in which job titles were categorised by an a priori constructed job exposure matrix into three classes of exposure, 80% of those exposed to organic dust were also exposed to mineral dusts and gases or fumes.¹²

The multicentre case-control study found an increased risk of lung cancer associated with ever being a farmer (OR 1.13,

95% CI 1.04 to 1.22). The study did not take into account that there are two main categories of farmers—livestock/dairy farmers and crop/orchard farmers. Livestock/dairy farmers but not crop/orchard farmers were protected against lung cancer according to the study in Italy.¹⁰

In this increasingly mobile world where workplaces have changed drastically, the traditional approach ‘ever versus never’ exposed could provide misleading results.¹³ To guide prevention and adjudicate compensation, the time-effect relation should be considered at the same time as the exposure-effect relationship. Otherwise the critical functions of epidemiology in the resolution of evidence-based medical controversies, which now act to protect the interests of both workers and employers, will become disconnected from reality.

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