VHL mutations in renal cell cancer: does occupational exposure to trichloroethylene make a difference?

Abstract:

Occupational exposures have long been suspected to play a role in the incidence of renal cell carcinoma (RCC). Especially, the carcinogenicity of the industrial solvent trichloroethylene (TCE) has been controversially debated, both with respect to the epidemiological and the molecular studies. In order to further elucidate this issue, it appeared important to compare suitable RCC patient groups, i.e., TCE-exposed versus non-TCE-exposed patients. We evaluated RCC from a previous German study that had described differences in RCC risks between TCE-exposed (n=17) and non-exposed patients (n=21). We compared age at diagnosis and histopathologic parameters of tumors as well as somatic mutation characteristics in the kidney cancer causing VHL tumor suppressor gene. RCC did not differ with respect to histopathological characteristics in both patient groups. We noticed a younger age at diagnosis in TCE-exposed patients compared to non-exposed patients (P=0.01). Moreover, the non-TCE-exposed patients did not share the somatic VHL mutation characteristics of TCE-exposed patients such as the previously identified hot spot mutation 454 C> T P81S or multiple mutations. These data support the notion of a putative genotoxic effect of TCE leading to VHL gene damage and subsequent occurrence of RCC in highly exposed subjects.