

Beryllium and lung cancer: A weight of evidence evaluation of the toxicological and epidemiological literature

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The potential carcinogenicity of beryllium has been a topic of study since the mid-1940s. Since then, numerous scientific and regulatory bodies have assigned beryllium to various categories with respect to its carcinogenicity. Past epidemiologic and animal studies, however, have been marked with notable methodological shortcomings. Because it has been about 16 yr since IARC evaluated beryllium and approximately 50 relevant papers on the topic have been published since that time, we conducted a weight-of-evidence analysis of the historical as well as recent animal and human literature. We also assessed whether recently published studies improved upon methodological shortcomings or shed light upon uncertainties in prior studies. Thirty-three animal studies, principally designed to evaluate the cancer hazard or related mechanisms, and seventeen epidemiologic studies were considered in this assessment. Based on this analysis, the evidence for carcinogenicity of beryllium is not as clear as suggested by previous evaluations, because of the inadequacy of the available smoking history information, the lack of well-characterized historical occupational exposures and shortcomings in the animal studies. We concluded that the increase in potential risk of lung cancer was observed among those exposed to very high levels of beryllium and that beryllium's carcinogenic potential in humans at exposure levels that exist in modern industrial settings should be considered either inadequate or marginally suggestive.

Keywords: Beryllium, Epidemiology, IARC, Lung Cancer, Toxicology