Letter to the Editor

RE: Attfield MD, Costello J. 2004. Quantitative Exposure-Response for Silica Dust and Lung Cancer in Vermont Granite Workers. Am J Ind Med 45:129–138

To the Editor:

In the published analysis of the granite workers, results both with and without the last exposure group were presented. No attempt was made to be selective or to hide the apparent anomaly in the findings. The fact that the statistical significance of the exposure-response relationship was dependent on the exclusion of the highest exposure group was readily acknowledged. This particular issue was discussed at length in the article.

Excluding that highest exposure group, there is a clear and monotonic rise in the standardized risk ratios with increasing exposure in the remaining exposure groups, and the lung cancer mortality results are significantly elevated above expected for the two highest exposure groups. The results for the highest exposure group are at variance with those for all other exposure groups. In fact, such anomalies are common in exposure-response analyzes of occupational mortality cohorts, and various mechanisms have been postulated for their cause [Stayner et al., 2003]. As the authors of that article note: ''It seems particularly inappropriate to reject a causal relationship between exposure and disease altogether because of a lack of a linear exposure-response trend when a nonlinear relationship may be just as plausible for the reasons discussed in this paper'' (e.g., worker selection or toxicological considerations). In our analysis, a statistically significant curvi-linear relationship of lung cancer mortality with increasing exposure was noted when all exposure groups were included.

The high exposure levels experienced in the past should best remain historical. Workers who experienced a working life at silica dust levels in compliance with the NIOSH recommended exposure limit (i.e., 45 years at 0.05 mg/m^3 or less) would have cumulative exposures within the studied range of exposures for all but the highest exposure group. On this basis, it seems appropriate to have emphasized the exposure-response relationship restricted to the lower silica dust exposures.

The Vermont granite workers cohort and related information continues to be of tremendous utility to the occupational health community. To a great extent, this is due to the personal efforts of Dr. Graham and others in Vermont, who initially collected and preserved these data so long ago. It is a tribute to their careful work that findings can be derived from those products that remain of relevance to preventing ill health among today's workers. An indirect acknowledgement was intended in citing the earlier cohort mortality study published in 1988 by Costello and Graham, to which interested readers were referred for details on the initial assembly of the cohort.

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REFERENCE

Stayner L, Steenland K, Dosemeci M, Hertz-Picciotto I. 2003. Attenuation of exposure-response curves in occupational cohort studies at high exposure levels. Scand J Work Environ Health 29(4): 317–324.

Response to Letter dated Feb. 21, 2004, from William G.B. Graham, MD.
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