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Coal dust exposure and ischemic heart disease mortality among a cohort of underground coal miners

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Exposure to particulate in air pollution is known to increase the risk of mortality from ischemic heart disease (IHD). Underground coal miners are exposed to significant concentrations of particulate from coal dust in their work environment. We used a proportional hazards regression model to estimate the association between cumulative coal dust exposure and IHD mortality, adjusted for age, smoking and BMI, among a cohort of 9,078 male coal miners who had participated in the National Study of Coal Workers' Pneumoconiosis from 1969 through 1971. The cohort was followed for mortality through 1993. Coal rank, an indicator of the physical composition of the coal, was also included in the model. Compared to the group with the lowest dust exposure, the relative risk of IHD mortality at higher exposure levels ranged from 1.24 (95% CI 0.97-1.57) to 1.49 (95% CI 1.16-1.90). The increase in risk was not linear, which may be due to the effect of coal workers' pneumoconiosis (CWP) as a competing cause of death. Mortality risk was also associated with coal rank. Although present day dust exposures are lower than those experienced by this cohort, we estimate that miners are currently exposed to levels of PM_{2.5} (particulate <2.5 μm diameter) over 10 times higher than those found to result in excess cardiovascular mortality in air pollution studies, based on analysis of the particle size distribution of coal dust under the current regulatory dust standard. As deaths from CWP decline, ischemic heart disease may become increasingly important as a health effect of coal dust exposure.

Learning Objectives: At the conclusion of the session, the participant in this session will be able to

- Describe the association between coal dust exposure and ischemic heart disease.
- Compare the particulate exposure of miners working in a coal mine to the particulate exposure experienced by the general population from air pollution.

Presenting author's disclosure statement:

I do not have any significant financial interest/arrangement or affiliation with any organization/institution whose products or services are being discussed in this session.

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