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MORBIDITY AND MORTALITY WEEKLY REPORT

Epidemiologic Notes and Reports

Silicosis — Illinois

The recent diagnosis of silicosis in several workers at 2 specialized silica-mining and processing mills in southern Illinois prompted an environmental and medical survey by the National Institute for Occupational Safety and Health (NIOSH) in July 1979.

Both companies mine microcrystalline quartz (silica) and process this material by drying and milling. The resulting product, "silica flour," consists of fine particles, 99% of which are <10 micrometers (μm) in diameter (i.e., they are respirable). The material is bagged and distributed internationally for use as industrial and toothpaste abrasives, paint extenders, fillers for cosmetics, and other manufactured products.

Silica-dust levels in the air measured between 1973 and 1979 were available from the federal Mine Safety and Health Administration (MSHA). At both facilities, the mean silica-dust level for each of more than a dozen inspections was >5 times the MSHA-mandated threshold limit value (TLV), the legally enforceable standard.*

The NIOSH investigation revealed the dust to be essentially 100% crystalline silica, with a mean particle diameter of 2.3 to 5.2 μm. Seventy-seven of 91 (85%) dust samples exceeded the NIOSH-recommended silica-dust standard of 0.05 mg/m^3 (*2*). Many were between 10 and several hundred times the recommended standards.

Eighty-six current and ex-workers participated in the health survey. Silicosis was diagnosed when at least 2 of 3 NIOSH-certified readers independently interpreted a postero-anterior chest radiograph as at least minimally positive (i.e., category 1/0 profusion or greater, based on the 1971 international standard classification [*3*]).

None of the 25 current workers with less than 1 year of dust exposure had silicosis. Of 61 current and ex-workers with more than 1 year's exposure to silica dust, 23 (37%) had silicosis. Seven (11%) of these had evidence of progressive massive fibrosis (PMF), an advanced stage of the disease. Pulmonary function test results varied considerably in those with simple silicosis; however, 6 of the 7 with PMF had restrictive lung disease (defined as forced vital capacity <80% of the predicted value). The mean duration of silica dust exposure in those with simple silicosis was 8 years (range 1 to 19 years). In those with PMF, the mean duration of exposure was 7 years (range 2.5 to 14.0 years). One man, age 24, had radiologic evidence of silicoproteinosis and PMF after 2½ years of exposure.

*The actual values are computed and vary according to the percentage of free silica present. If the sample has less than 1% free silica, the TLV is 10 milligrams per cubic meter (total dust sample). If the sample analysis indicates >1% free silica, a respirable sample is taken, and the TLV is calculated using the formula: $\frac{10}{\%\ \text{free silica} + 2}$. The resulting figure is multiplied by 1.2 to incorporate sampling-error factors.

Silicosis – Continued

Reported by Div of Respiratory Disease Studies, NIOSH, CDC.

Editorial Note: Silicosis—the oldest recognized occupational pulmonary disease—continues to be a common diagnosis. This disease is directly related to excessive silica dust exposure and is completely preventable through application of available control technology. The disease can only be acquired through inhalation of respirable-size silica dust.

The natural history of silicosis is not predictable. Not uncommonly, the earlier stages of simple silicosis progress to advanced simple silicosis and PMF, even after the worker is removed from silica-dust exposure. The worker frequently becomes short of breath with a progressive decline in vital capacity and exercise tolerance. In some, this may eventually lead to respiratory failure and early death. Silicosis patients are at very high risk of contracting tuberculosis. No therapy for silicosis is effective.

The high prevalence of silicosis in these workers reflects exposure to extremely high respirable dust levels for an extended period of time, high silica content of the dust, and lack of adequate respiratory protective measures. These data also confirm the need for enforcement and compliance with the existing silica standard. Of the 2 facilities investigated here, 1 has been temporarily closed, and workers in the other now use positive-pressure breathing equipment.

References

1. American Conference of Governmental Industrial Hygienists. Threshold limit values for chemical substances and physical agents in the workroom environment with intended changes for 1972. Cincinnati, Ohio: ACGIH, 1972.
2. Criteria for Recommended Standard. Occupational Exposure to crystalline silica. Washington, DC: NIOSH, 1975. (DHEW publication no. (NIOSH) 750129).
3. Jacobson G, Lainhart W. ILO U/C 1971 international classification of radiographs of the pneumoconioses. Med Radiogr Photogr 1972;48:65-110.

International Notes

Legionellosis – Västerås, Sweden

The largest outbreak of legionellosis yet documented outside the United States occurred from August 28-September 21, 1979, in Sweden.

During that period, 66 residents of and 1 visitor to Västerås (population, 100,000) had onset of an illness characterized by high fever and pneumonia with serologic evidence of legionellosis. Ages ranged from 26 to 91 years. Most of the patients also had headache, abdominal symptoms, and mental disturbances. One patient died of acute renal failure. In 51 patients, a ⩾4-fold rise in reciprocal antibody titer equal to or greater than 128 to *Legionella pneumophila* serogroup 1 was demonstrated by indirect immunofluorescence; the other patients had convalescent-phase titers ⩾128. *L. pneumophila* serogroup 1 was isolated from lung tissue obtained by closed biopsy in 3 patients. Identification was confirmed by gas-liquid chromatography and direct immunofluorescence.

The mode of spread and source of *L. pneumophila* have not been defined in this outbreak. However, the large majority of ill persons had visited 1 indoor shopping center 2-10 days before onset of illness; 2 of the patients were employees in the shopping center.

Rocky Mountain Spotted Fever — Continued

by the Weil-Felix agglutination test or, preferably, the more specific CF or MIF tests (*5*), is not possible until the 10th-14th day of illness.

Since ticks must be attached for several hours before infection can occur, the only preventive measure available for those persons, such as hikers, who are likely to be exposed to ticks is to check for them frequently. No vaccine is currently available, although one is in the early stages of development.

References

1. CDC: Rickettsial disease surveillance report no. 1 1975-1978. Atlanta: CDC, 1979. (DHEW publication no. (CDC)79-8379).
2. D'Angelo LJ, Winkler WG, Bregman DJ. Rocky Mountain spotted fever in the United States, 1975-77. J Infect Dis 1978;138:273-6.
3. MMWR 1979:28:181-2.
4. Hattwick MAW, Retailliau H, O'Brien RJ, et al. Fatal Rocky Mountain spotted fever. JAMA 1978; 240:1499-1503.
5. Hechemy KE. Laboratory diagnosis of Rocky Mountain spotted fever. N Engl J Med 1979;300: 859-60.

Erratum, Vol. 29, No. 17

p203 In the article, "Legionellosis in a Child — Kentucky," a name in the credit section was misspelled. The correct name and affiliation are: CM Cottrill, MD, University of Kentucky Medical Center, Lexington.

The Morbidity and Mortality Weekly Report, circulation 88,700, is published by the Center for Disease Control, Atlanta, Georgia. The data in this report are provisional, based on weekly telegraphs to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Center for Disease Control, Attn: Editor, Morbidity and Mortality Weekly Report, Atlanta, Georgia 30333.

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