

Silica exposure in decline, but ethnic workers remain at high risk

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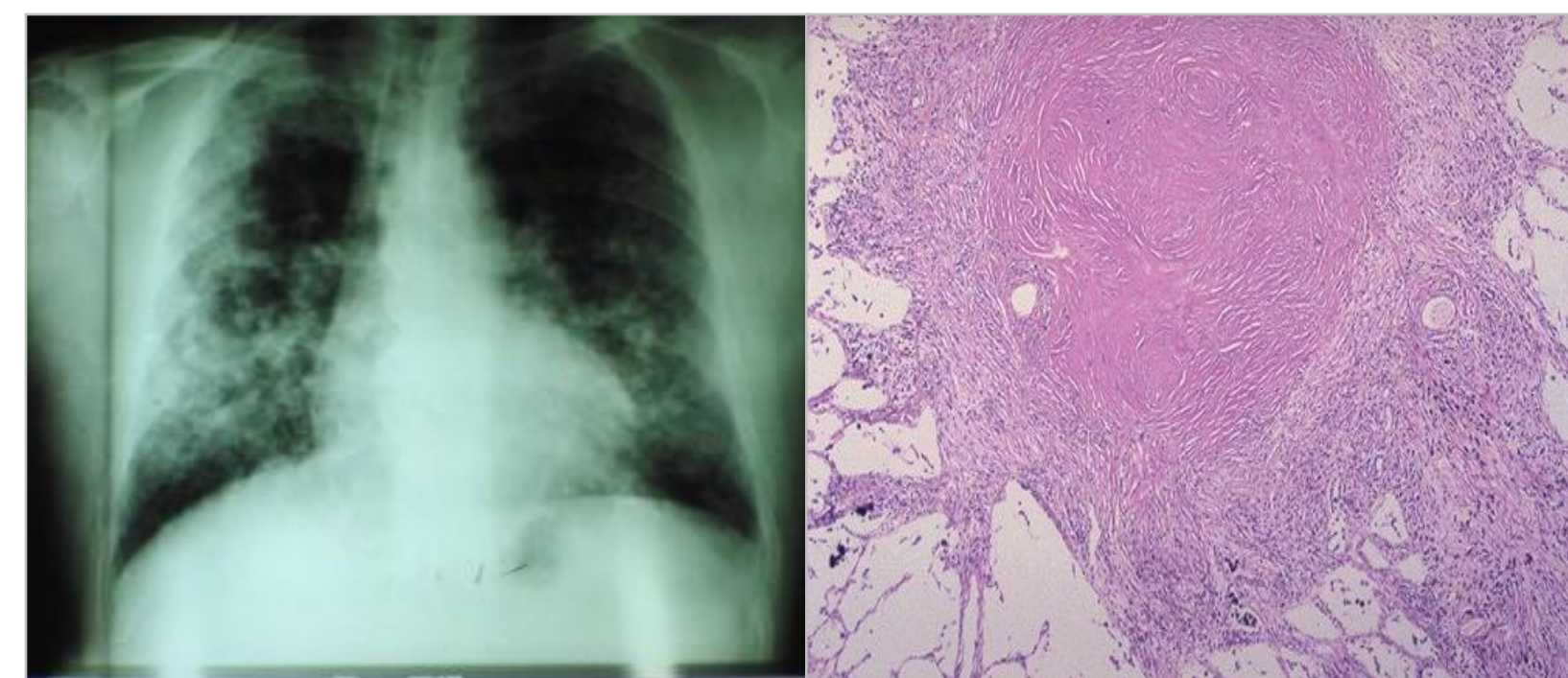
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Introduction

The "silica is just dust" way of thinking has prevented many worker populations from receiving health benefits from exposure control for crystalline silica. Quartz dust is a known human carcinogen that causes a multitude of systemic illnesses and lung diseases, including silicosis, which is debilitating, progressive and lethal. Improved dust control and current prevention efforts appear to be lessening the occupational silicosis problem in most industrialized nations, but minority workers are at greater risk, and lacking the benefits of effective dust control strategies.

This research examined the incidence of silica-related disease among disparate workforces.

Figure 1. Clinical picture of silicosis.



Exposure Snapshot

Figure 2. Oil-pipe sandblasting.



Figure 3. Example of silica exposure reduction method: concrete cutting with water.



Methods

Method of Review: Literature was examined for evidence of silica-related disease burden of disparate worker populations.

Questions asked: Is the apparent effect of silicosis reduction true for all groups, including ethnic groups? What are the implications for occupational health professionals?

Health Disparities

...are differences in incidence, prevalence, mortality, burden of disease and other adverse health conditions or outcomes.

...affect population groups based on gender, age, ethnicity, socioeconomic status, geography, sexual orientation, disability or special health care needs.

...occur among groups who have persistently experienced historical trauma, social disadvantage or discrimination, and systematically experience worse health or greater health risks than more advantaged social groups.

Workplace Hazards as Health Disparities

- ❖ Is the disease burden greater for an ethnic or low-income group than the general population?
- ❖ Do those groups/communities suffer a greater health impact because of work management policies?
- ❖ Do these communities lack education or resources to effectively protect them from harm in the workplace?

Historically, Silica Exposure has been a World-Wide Problem

- French and German uranium miners
- Female stone grinders in India
- Chinese auto foundry workers
- U.S. underground coal miners
- Turkish denim sandblasters
- Iron ore miners in Sweden
- German porcelain workers
- Granite workers in Spain

Results

Silica-exposed U.S. workers in construction, foundries, and sandblasting tend to be low-income African Americans, Mexican-Americans, American-Indians and other ethnic minority groups.

Exposure control in the dusty trades has improved the silicosis picture, but many dusty jobs have migrated to nations with less concern about health and regulation.

Table 1. Highlighted studies from analysis.

U.S. Cases	International Cases
African Americans had 6x the risk of silicosis in Michigan, compared to whites.	Italy: Ceramic workers with silicosis (females) and excess kidney disease (males).
American Indian miners had excess risks of lung cancer and silicosis, despite very low smoking rates.	Spain: Female scouring plant workers with excess rates of autoimmune diseases from silica flour exposure.
Hispanic farm workers' autopsies showed early silicosis and mixed dust fibrosis in California.	Russia and former Soviet Union: Silicosis and silico-TB remain problem with new and old industries.
Young (~30 yrs old) Mexican oilfield pipe blasters in Texas had acute and accelerated silicosis after unprotected silica exposure at 7x the U.S. OSHA standard.	South America and South Africa: Gold and other ore mines with refractory silica problems and continuing excesses of silicosis.
West Virginia Hawks Nest Tunnel (Gauley Bridge) disaster in the 1930's: Congressional investigations and national outrage over acute and accelerated silicosis among African-American, migrant groups.	China: Every year since 1980 there have been ~20,000 cases and ~5,000 deaths of occupational lung diseases. About 2/3 of cases have been silicosis.

Conclusions

Silica-related disease is a health disparities issue in the U.S. Despite improved protection for some workers, silica dust-related illnesses have a greater impact on low-income Navajo, Black, Latino, and other ethnic minority groups than on the general population. These communities show greater incidence of silica-linked conditions, and also lack the education, resources and power to demand effective protection.

U.S. public health, industry, and occupational medicine leaders need to provide greater collaboration with minority communities at risk so that dust control can become universal. Programs should stress prevention and evaluation efforts to effectively target worker populations disproportionately exposed to silica at work, including minority and immigrant communities.

Silica-exposure reduction interventions should include a combination of accountability, translation, defined parameters for reduction in disease risks, research, medical surveillance, and regulation.

Recommendations

- ❖ Health professionals' leadership is needed to advocate for workers' compensation and community prevention programs.
- ❖ Academic and industrial medicine professionals need to share prevention knowledge with affected workers and their communities.
- ❖ Develop new curricula, exposure assessment, and industrial hygiene focusing on dusty trades, many of which hire low-skilled, ethnic and immigrant workers.
- ❖ Improve biomonitoring for silica, including biopsies/tissue analyses, and joint training with and for health providers.
- ❖ Expand awareness of separating work and home clothing, and appropriate use of personal protective equipment (PPE).

References

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