

Original Investigation

July 24, 2023

Silicosis Among Immigrant Engineered Stone (Quartz) Countertop Fabrication Workers in California

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JAMA Intern Med. Published online July 24, 2023. doi:10.1001/jamainternmed.2023.3295



Editorial
Comment

[Engineered Stone–Associated Silicosis—A Lethal Variant of an Ancient Disease](#)

Jeremy T. Hua, MD, MPH; Cecile S. Rose, MD, MPH; Carrie A. Redlich, MD, MPH

Key Points

Question What are the characteristics of patients in California with silicosis from occupational exposure to dust from engineered stone (quartz), a popular material that is high in silica content and that is used to fabricate countertops?

Findings In this case series of 52 patients, the median age was 45 years at diagnosis, and nearly all were Latino immigrant men. Diagnosis was delayed in 58%, with 38% presenting with advanced disease (progressive massive fibrosis), and 19% died.

Meaning In California, silicosis associated with occupational exposure to dust from engineered stone primarily occurred among young Latino immigrant men; many patients presented with severe disease, and some cases were fatal.

Abstract

Importance Silicosis associated with inhalation of respirable crystalline silica among engineered stone countertop fabrication workers is an emerging health concern.

Objective To describe clinical, socioeconomic, and occupational characteristics of patients diagnosed with silicosis as-associated with engineered stone in California.

Design, Setting, and Participants This case series included reported cases of silicosis associated with fabrication of engineered stone countertops, as identified by statewide surveillance by the California Department of Public Health (2019–2022). Data analysis was performed from October 2022 to March 2023.

Exposures Patient interviews and medical record abstractions were used to assess occupational exposure to respirable crystalline silica, including duration of work tenure and preventive measures undertaken.

Main Outcomes and Measures Demographics, clinical characteristics, health care utilization, and clinical outcomes were obtained, including vital status, hypoxia, and lung transplant.

Results This case series identified 52 male patients meeting inclusion criteria; median (IQR) age was 45 (40–49) years, and 51 were Latino immigrants. Ten (19%) were uninsured, and 20 (39%) had restricted-scope Medi-Cal; 25 (48%) presented initially to an emergency department. A delay in diagnosis occurred in 30 (58%) patients, most commonly due to alternative initial diagnoses of bacterial pneumonia (9 [30%]) or tuberculosis (8 [27%]). At diagnosis, 20 (38%) patients had advanced disease (progressive massive fibrosis) with severely or very severely reduced forced expiratory volume in 1 second in 8 (18%) and 5 (11%), respectively. Of the cases, 10 (19%) were fatal; median (IQR) age at death was 46 (38–51) years, and 6 patients (12%) were alive with chronic resting hypoxia. Eleven were referred for lung transplant: 3 underwent transplant with 1 fatality; 7 were declined transplant, with 6 fatalities; and 1 died prior to listing. Median (IQR) work tenure was 15 (10–20) years; 23 (45%) reported use of water suppression for dust mitigation, and 25 (48%) continued to fabricate stone after being diagnosed with silicosis.

Conclusions and Relevance In this case series performed in California, silicosis associated with occupational exposure to dust from engineered stone primarily occurred among young Latino immigrant men. Many patients presented with severe disease, and some cases were fatal.

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Comment

| Clinical Practitioner

Regulatory action is required if, as a society, we are interested in reducing preventable deaths. As gravely concerning the numbers presented in this case series represents, hidden from the formal statistics are those workers who have already been exposed and yet to develop the disease.

I write this from my perspective as a former member of the National Dust Diseases Taskforce (2019-2021) in Australia - see: Silicosis-lessons from Australia's Dust Diseases Taskforce (2019-21) *Occup Med (Lond)* 2022 Aug 16;72(6):354-356. doi: 10.1093/occmed/kqab184

July 25, 2023

The tip of the silicosis iceberg

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The epidemic of silicosis among engineered stone workers reported by Fazio et al in this Journal is very important in raising public awareness of this entirely preventable disease. As Dr. Graeme Edwards already commented, and as the accompanying Editorial by Hua et al notes, this disease is likely under-reported. Fazio et al report all 52 patients had abnormal CT scans, justly observing very careful criteria for including cases in their series. Four points I would like to emphasize: [1] some criteria for diagnosis of (and compensation for) silicosis requiring an abnormal plain chest X-ray (CXR) will be falsely negative in many early cases of accelerated silicosis (developing within <10 years of exposure), [2] biopsies may show silicosis when the CXR is negative, [3] even with biopsy, features of accelerated silicosis may not be recognized, and [4] small transbronchial biopsies may not reveal diagnostic histopathology.

The historical parallels between this current epidemic and the epidemic of accelerated silicosis in Texas oil field sandblasters, which we have been studying since the 1990s [Abraham JL and Wiesenfeld SL. Two cases of fatal PMF in an ongoing epidemic of accelerated silicosis in oilfield sandblasters: lung pathology and mineralogy. *Inhaled Particles VIII, Ann Occup Hyg* 41 (Suppl. 1): 440-447, 1997], are the basis for my comment.

It is encouraging to learn that the California Occupational Health Standards Board voted unanimously on July 20, 2023 to develop an Emergency Temporary Standard (in response to a petition by Dr. Harrison et al).

[to the Editor: not sure if you want more references cited in this format?]

July 25, 2023

The failure of worker compensation to prevent work related diseases

David Egilman, MD MPH | Brown University

Only 7 of 52 patients with silicosis received compensation or payments for medical care. Work related disease is a capitalist externality. The failure to compensate these workers encourages companies to continue to fail to protect these workers. The conditions that caused these deaths and injuries are not "accidents." Criminal penalties are needed to prevent these and other expected injuries.
