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IMAGES IN TOXICOLOGY

Chronic silicosis in mining workers

Alejandro C. Ayra Illanes* and Stephanie M. Santiago Barriga

National Health Fund (CNS), La Paz, Bolivia.
*aayraillanes@gmail.com

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Abstract. Two clinical cases of silicosis are reported in mining workers from the 'El Nevado' Mining Cooperative in Pacuni (La Paz Department, Bolivia). The symptoms, physical examinations, and complementary tests performed are described in detail. The radiographic findings were characteristic of this pathology.

Key words: *Silica; Silicosis; Pneumoconiosis; Mining; Lung.*

Mining is one of the primary economic activities worldwide. Mineral extraction is conducted in various ways, including underground mining, where workers are exposed to silica (SiO_2). This paper presents a clinical case study of two underground miners from the 'El Nevado' Mining Cooperative in Pacuni (La Paz Department), located in the Bolivian Altiplano at an altitude of 5,003 metres above sea level.

Patient A

A 29-year-old male worker with a 16-year history of silica dust exposure. At the time of consultation, he was working as a drilling miner, having held other positions in the past. He presented with mild dyspnea (Medical Research Council [MRC] Dyspnea Scale grade I), nocturnal cough, and peripheral cyanosis. On auscultation, bilateral rhonchi and wheezing were heard in both lung fields. Vital signs: BP 130/80 mmHg, HR 84 bpm, RR 22 bpm and SpO2 83% (FiO2 0.21). Laboratory results: HCT 60%, HGB 21 g/dL, RBC 6,300,000/mm3, Cr 1.0 mg/dL, and Glu 71 mg/dL. Thoracic X-ray: bone demineralisation, diffuse bilateral nodular lung pattern with nodules up to 3 mm in diameter, more prominent in the upper lobes and hilar region (Fig. 1). Spirometry showed an obstructive pattern with an FEV1/FVC ratio of 65%.

Figure 1. Thoracic X-ray of patient A, 16-year history of exposure to silica dust.

Figure 2. Thoracic X-ray of patient B, 24-year history of exposure to silica dust.

Patient B

A 49-year-old male worker with a 24-year history of silica dust exposure. At the time of consultation, he was working as a cart miner, having held other positions in the past. He presented with moderate dyspnea (MRC grade II), persistent cough predominantly in the morning, and central and peripheral cyanosis. On auscultation, diffuse rhonchi, wheezing, and crackles were heard in both lung fields. Vital signs: BP 150/90 mmHg, HR 80 bpm, RR 24 bpm and SpO2 79% (FiO2 0.21). Laboratory results: HCT 64%, HGB 23 g/dL, RBC 7,500,000/mm3, Cr 1.5 mg/dL and Glu 85 mg/dL. Thoracic X-ray: progressive massive fibrosis with areas of nodular conglomerates associated with fibrocalcifications. A 'tent sign' (juxtaphrenic peak sign) was present in the left lung, and right diaphragmatic blunting. Additionally, there was cardiac silhouette enlargement and pulmonary artery prominence associated with pulmonary hypertension (Fig. 2). Spirometry showed a mixed pattern with FEV1 64%, FVC 70%, and an FEV1/FVC ratio of 61%.

Conflicts of interest

The authors declare no conflicts of interest.

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