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CASE REPORT

Acute Pulmonary Toxicity Linked to Use of a Leather Protector

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Leather protectors are used extensively for waterproofing leather garments. Inhalation exposure to this type of product is usually considered a benign incident. We report two cases of acute pulmonary toxicity associated with the use of a new leather protector recently introduced to the Canadian market. Emergency physicians must be aware of the potential acute toxicity of new leather protectors.

[Laliberté M, Sanfaçon G, Blais R: Acute pulmonary toxicity linked to use of a leather protector. *Ann Emerg Med* June 1995;25:841-844.]

INTRODUCTION

Leather protectors are used extensively for waterproofing leather garments. Inhalation exposure to a leather protector is usually considered a benign event with little evidence of toxic effects reported in the medical literature. We report two cases of acute pulmonary toxicity associated with the use of a new formulation of leather protector that was introduced to the Canadian market. In 1 month, 16 people reported the occurrence of acute respiratory symptoms after the use of this new leather protector

CASE REPORTS

Patient 1 A 27-year-old man called the Quebec Poison Control Center complaining of acute respiratory symptoms after the use of a leather protector called Oiled Nubuck Leather Protector. Earlier that day he had sprayed a pair of shoes with this leather protector in a large apartment with the windows and doors closed. Fifteen minutes later, acute respiratory symptoms of dyspnea, a dry cough, and anterior chest pain developed. The patient felt dizzy and chilly; his temperature at that time was 38.5°C. He went outside for fresh air, but came back inside as he felt more dyspneic. A few minutes later, his 26-year-old wife, who had been sitting within several feet of her husband when the leather protector was used, began to feel ill with

similar respiratory symptoms. Both patients were advised by the poison center to seek medical care immediately.

Medical evaluation on arrival in the emergency department later that day showed a man in moderate respiratory distress. His medical history was negative for asthma or chronic respiratory disorders. The history of acute respiratory symptoms occurring minutes after the use of the leather protector was confirmed. His symptoms included dyspnea at rest, dry cough, palpitations, and anterior chest pain. The patient appeared to be in moderate respiratory distress without evidence of cyanosis. Vital signs were blood pressure, 120/70 mm Hg; pulse, 108; respirations, 28; and temperature, 37°C. Head and neck examination was normal. Cardiac examination showed tachycardia without murmurs. Lung auscultation showed good air entry with diffuse bilateral wheezing. The chest radiograph was normal. Portable spirometry was performed before treatment and showed a mild obstructive syndrome (Table 1).

The patient was treated with supplemental oxygen, 5 mg nebulized salbutamol in normal saline solution, and 40 mg of prednisone orally. His peak expiratory flow rate (PEFR) improved rapidly from 396 L/min before treatment to 560 L/min after treatment. The patient was discharged home after 8 hours. Outpatient treatment included a salbutamol metered-dose inhaler and oral prednisone. One week later, the patient complained only of mild shortness of breath on exercise. His physical examination was normal. Four weeks later, he was asymptomatic and his medication was discontinued. Pulmonary function tests obtained at 1 week were normal (Table 1).

Patient 2 The patient's wife also had a medical history negative for respiratory disorders. She reported acute respiratory symptoms—severe shortness of breath at rest, dry cough, palpitations, and diaphoresis—that began a few minutes after her husband used the leather protector. Physical examination revealed a young woman in moderate respiratory distress with tachypnea, diaphoresis, and mild cyanosis. Vital signs were blood pressure, 140/80 mm Hg; pulse, 120; respirations, 32; and temperature, 37.8°C. Oxygen saturation was not recorded, but the cyanosis corrected rapidly after administration of 100% oxygen. Cardiac examination showed tachycardia without murmurs. Lung auscultation showed good air entry with diffuse, bilateral wheezing. A chest radiograph showed diffuse bilateral interstitial infiltrates consistent with pulmonary edema.

The patient's PEFR was 250 L/min. She was treated with supplemental oxygen, 5 mg nebulized salbutamol in normal saline solution, and 40 mg IV methylprednisolone every 6 hours. Her subjective response to treatment was rapid, and her PEFR increased to 320 L/min 1 hour after admission. A second chest radiograph 24 hours later was normal. The patient's total leukocyte count on admission was 19,800 mm^3 with 81% neutrophils; it rose to 29,300 mm^3 at 24 hours with 88% neutrophils. The patient was discharged approximately 24 hours later on a salbutamol metered-dose inhaler and oral prednisone. Four weeks after the event, the patient remained asymptomatic, physical examination was normal and her medication was discontinued. Pulmonary function tests at that time were normal (Table 1).

Oiled Nubuck Leather Protector (Panita Entreprises, Vancouver, British Columbia) was a new formulation first distributed in Canada in late 1993 and sold primarily in Quebec. This leather protector also was manufactured in the United States by Vanguard Chemical Corporation (St Louis, Missouri). The product was sold in Quebec in 237-mL pump spray containers under different store brand names (Simard et Voyer, Transit, Pegabo, Aldo, and Panita). According to the Canadian distributor, the formulation of the leather protector was 95% Soltrol-10 iso-

Table 1.
Pulmonary function tests.

	Patient 1				Patient 2	
	Admission		1 Week After Exposure		4 Weeks After Exposure	
Parameter	Measured	% Predicted	Measured	% Predicted	Measured	% Predicted
Vital capacity (L)	4.18	67	4.90	84	3.11	76
Forced vital capacity (L)	3.85	62	5.02	86	3.32	81
Forced expiratory volume in 1 second (L)	2.96	57	3.94	79	2.92	84
Forced expiratory volume in 1 second (L)/ forced vital capacity (L)	77	−6	77	−7	88	+4
Peak expiratory flow rate (L/sec)	396	63	548	90	349	84

for their illness is direct pulmonary toxicity of one or more of the ingredients. Hydrocarbons, namely trimethylpentane or C7 and C8 isoparaffins, or the fluoropolymer resin might have played a role in the pulmonary toxicity.

Other commercially available leather protectors are made of various concentrations of trichloroethane as well as other hydrocarbons and chemical substances. Inhalation of trichloroethane is known to cause central nervous system symptoms, but there is little evidence of pulmonary toxicity. Woo et al[4] described acute respiratory symptoms and hypoxemia in a 25-year-old man after the use of a waterproofing aerosol product containing trichloroethane and a fluorocarbon resin.[4] The authors attributed these effects to the trichloroethane portion of the formulation. Other descriptions of pulmonary toxicity secondary to inhalational exposure to hydrocarbons can be found; some occurred in the context of professional exposures to kerosene[5] or to naphtha distillate vapors.[6]

In the cases described in our report, the leather protector was used indoors in areas with limited ventilation, thereby increasing the risk of pulmonary toxicity. Customers should be advised by manufacturers of sprayed leather protectors against indoor use of their products; a large, easily seen warning label should be placed on the can for this purpose. The information we report was obtained primarily by telephone. Other unknown environmental factors may have played a role in the acute pulmonary toxicity reported.

SUMMARY

Two cases of acute pulmonary toxicity associated with the use of a new leather protector are reported. We speculate that the effects of this exposure were secondary to direct pulmonary injury by the hydrocarbon ingredients or the fluoropolymer resin. Both cases responded rapidly to supportive treatment with bronchodilators and corticosteroids. More cases involving similar formulations of leather protectors have been reported. Emergency physicians should be aware of the potential acute pulmonary toxicity of leather protectors.

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