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Asthma caused by cyanoacrylate used in a leisure activity

To the Editor:

Acrylic compounds (acrylates, methacrylates, and cyanoacrylates) are volatile and chemically reactive agents used extensively in the manufacture of such products as adhesives, resins, solvents, and glues and in the health profession (dental prostheses and bone cement in orthopedics).¹ These agents are well known to cause occupational asthma,^{2,3} as well as skin sensitization and irritation.⁴ Although acrylate glues are widely used in several activities of daily life, to our knowledge, there has been only one case reported of their causing respiratory symptoms out of the workplace.⁵

We report bronchial asthma caused by cyanoacrylate in a 55-year-old man whose hobby was making miniature planes, an activity that required the use of a cyanoacrylate adhesive paste. This exsmoker had never experienced asthmatic or rhinitis symptoms. A year before being seen at the clinic, he reported acute dyspnea during a weekend, which is when he normally worked on his model planes; this episode required emergency care, followed by a short course of oral and inhaled corticosteroid therapy. After this occasion, he stopped practicing his hobby and did not require medication, except for short-acting bronchodilator occasionally when his respiratory symptoms were exacerbated by physical exercise, cold temperature, and heavy smells.

The results of skin prick tests to common aeroallergens were negative; spirometry showed an FEV₁ of 2.9 L (100% of predicted value), a forced vital capacity of 3.5 L (100% of predicted value), and an FEV₁/forced vital capacity ratio of 83% (normal). Methacholine bronchial responsiveness was normal (PC₂₀ = 128 mg/mL; normal value >16 mg/mL in our laboratory). The subject underwent a specific inhalation challenge (SIC) according to a standardized procedure.⁶ Results are shown in Fig 1. On a control day, the patient was exposed to diluent paint by means of nebulization for 30 minutes. Spirometry, methacholine testing, and induced sputum performed after diluent exposure produced normal results. On 2 subsequent days, exposure to cyanoacrylate was carried out by asking the patient to mimic his leisure activity in a challenge room, spreading cyanoacrylate glue on a piece of cardboard for progressively longer periods of time (totals of 4 and 30 minutes of exposure on the 2 days). The test revealed a typical early late response. Induced sputum performed before and after SIC demonstrated pronounced eosinophilia after the cyanoacrylate challenge: eosinophil counts switched from 0.5% before SIC to 63% at the end of the last day of exposure.

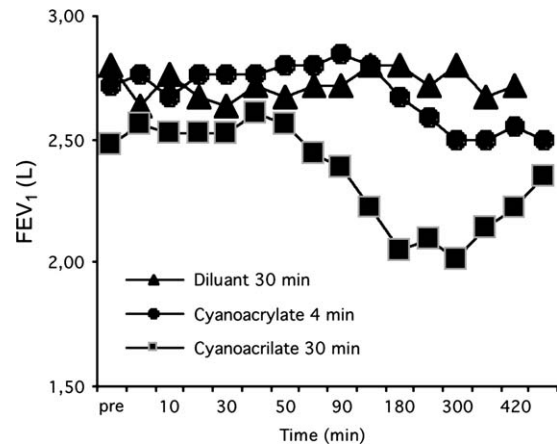


FIG 1. Results of SIC.

Occupational asthma caused by acrylates has been described often, but in this case exposure took place only on occasion during a leisure activity; it is relevant to highlight that in this nonatopic subject specific reactivity to the sensitizer persisted even 1 year after cessation of exposure. This case underlines the sensitization strength of acrylates, proved as well by the fact that very intermittent exposure was enough to trigger bronchial asthma. This can also reasonably explain why the subject was cured after stopping exposure.

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