

risk-associated haplotype because of the different genetic background among white and Asian populations. Second, the relatively small sample size in the Korean asthma study (439 patients and 374 control subjects) might not have allowed detection of the genetic effects revealed in the larger previous study. Finally, certain genes might lead to the development of asthma in specific ethnic-geographic populations because of different genetic background, environmental interaction, or both. Further studies are required to determine the genetic effect of haplotypes tagged by *GPRA-SNP522363G>C* in other studies.

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Supported by a grant from the National Research Laboratory of the National Research and Development Program from the Ministry of Science and Technology of Korea (contract grant no. M1-0302-00-0073).

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Available online October 4, 2004.
doi:10.1016/j.jaci.2004.08.003

Occupational asthma caused by shark cartilage dust

To the Editor:

Allergic occupational asthma can be caused by a large number of high-molecular-weight substances, mostly proteins derived from animals, plants, food, and enzymes.¹ Recently, the increasing use of traditional and

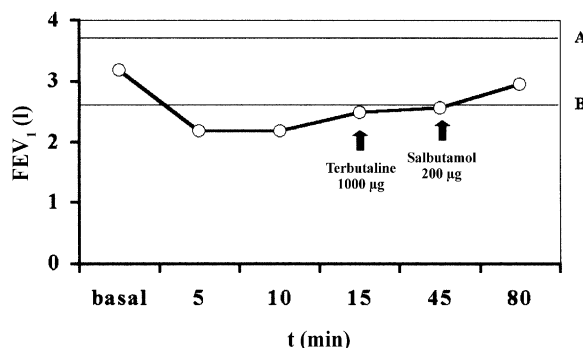


FIG 1. Bronchial challenge test with shark cartilage extract at 1/100 dilution. Line A, FEV₁ 100% of predicted. Line B, PC₂₀ FEV₁.

herbal remedies and dietary supplements has caused an outbreak of new potential allergens.²

We report a case of occupational asthma caused by shark cartilage dust. A 29-year-old man without a personal history of asthma or other respiratory disorders, a never-smoker, was admitted to the hospital for dyspnea. He worked in a dietetic product industry for 7 years, where he was in contact with plant extracts, amino acids, and vitamins, among other substances. The most significant exposure to dust was during the encapsulating process of the products contained in sacks. After a latent period of 2 years, he developed chest tightness, cough, and dyspnea, requiring bronchodilators and hospital admissions on several occasions. He also had moderate oculonasal symptoms. Initially, he improved on weekends and holidays, but subsequently he needed days off from work to become asymptomatic.

Physical examination in the hospital was normal. Skin prick tests to common aeroallergens were positive to several pollens and negative to dust mites, mold, cat, and dog epithelia. Skin prick-by-prick tests with products handled by the patient at work (*Hamamelis virginiana*, shark cartilage, *Aesculus hippocastanum*, *Melilotus officinalis*, and lemon flavor) were positive only to shark cartilage (8-mm wheal diameter) with a control wheal for histamine of 8 mm. Spirometric values were in the normal range. Serial determinations of peak expiratory flow rate were seen to drop by more than 20% during work periods, showing normal values on weekends. Methacholine challenge showed nonspecific airways hyperresponsiveness (PC₂₀, 0.06 mg/mL). Specific bronchial challenge test was performed with shark cartilage extract (10% wt/vol in PBS) and showed an immediate response at 1/100 dilution with a FEV₁ decrease of 31% at 5 minutes (Fig 1). A placebo-bronchial challenge test with PBS was negative. Immunoblotting with shark cartilage extract was positive, with a strong recognition of nonresolved antigens (Fig 2, A, lane 2). Treatment with urea and 2-mercaptoethanol had no result (results not shown). Therefore, a digestion with pepsin was performed, as previously described,^{3,4} obtaining several defined protein bands with molecular weights higher than 10 kd, as shown in Fig 2, B, lane 2. A study with 39 randomly selected, unexposed

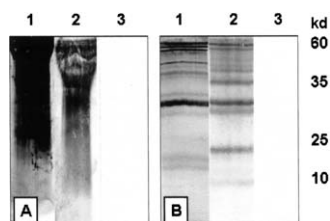


FIG 2. Effect of pepsin treatment on the specific IgE detection. **A**, Crude shark cartilage extract. **B**, Shark cartilage extract after pepsin treatment. Lane 1, SDS-PAGE, Coomassie blue-stained. Lane 2, specific IgE determination of the patient's serum. Lane 3, specific IgE determination of a specificity control serum.

patients was performed to test the specificity of the immunoblotting results with shark cartilage extract. The fact that none of the 39 sera recognized any band indicated very high specificity for the method.

In a review of fatal occupational asthma, we found a case suggesting shark cartilage dust as an asthma-inducing agent,⁵ but no skin prick test, bronchial challenge test, or specific IgE results were available. Therefore, this is the first case that demonstrates that shark cartilage induces an IgE-mediated occupational asthma.

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doi:10.1016/j.jaci.2004.07.057