

Respiratory allergy to exotic wood dust

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Summary

Three cases are presented showing nasal and respiratory allergy to cocabolla (*Dalbergia retusa*) an exotic timber which is a member of the rosewood family, and also to other wood dusts. They gave positive immediate reactions on patch testing, which became negative after injections of aqueous extracts. There were suggestions in this limited study of clinical improvement.

A possible relationship of this allergy to a quinone named dalbergiones present in cocabolla exists, but further work is necessary to confirm this.

Introduction

In recent years interest in the toxic effects of woods on human tissues has been increasing. The classical works on allergy do not mention wood as a source of either skin or respiratory allergy (Vaughan, 1948; Urbach & Gottlieb, 1946; Unger, 1945). However, an ever increasing number of woods have been shown to be respiratory allergens (Walker, 1969; Rosenbloom, 1920; Davidson, 1941; Piorkowski, 1944; Bahn, 1928; Schonwald, 1929; Stier, 1929; Coca, Walzer & Thommen, 1931; Senear, 1933; Morgan & Wilkinson, 1965; Morgan & Thomson, 1967; Morgan, Orsler & Wilkinson, 1968; Champion, 1970; R. J. Orsler, personal communication, 1969). Many of these timbers are the so-called 'exotic' woods. Some cause only skin allergies, others respiratory lesions, and some are known to cause both.

The literature contains a reference (Ordman, 1949) to hyposensitization therapy to kejaat wood (*Pterocarpus angolensis*) as far back as 1949 but no further discussion of this method of treatment of wood allergy appears in more recent articles. Cocabolla (*Dalbergia retusa*) is a hard wood of the rosewood family, and is an 'exotic' timber, which in view of its high cost is not normally used in furniture making. It has been reported (R. J. Orsler, personal communication, 1969) to cause dermatitis, but is not hitherto known as a respiratory allergen. The following account indicates that it is, and suggests that hyposensitization therapy can improve the condition.

The factory in which the cases occurred is a small modern factory manufacturing

billiard cues, employing about forty people on the factory floor. Although the building is new, the firm is long established and is experienced in the handling of exotic woods which may be irritant. Any wood which gives rise to frequent problems is not used by them, e.g. macassar-ebony caused such frequent problems that its use was discontinued and it has been replaced by 'black' ebony. When a possibly irritant wood is being cut or sanded there are extractor fans and ducting to remove the dust and masks are available for all employees. Prior to the occurrence of timber allergy in three employees, cocabolla had been in use as a decorative insert in the handle of certain billiard cues for 3 years.

Case reports

Case 1

Mr K.A.W., aged 35, is employed as a wood finisher in the factory. After 18 months he began to experience a dry unproductive cough accompanied by wheeze and a tightness in the chest with nasal obstruction. All his symptoms increased during the week and abated over week-ends and during holidays. He gave no history of previous personal allergies but has a strong family history of atopy. On examination his chest has repeatedly shown scattered rhonchi in all zones. His FVC was 3.01 litres, FEV 2.00 litres. A chest X-ray showed no abnormality but the sinus film showed mucosal thickening in both antra.

Patch testing using sawdust from a variety of woods gave contact dermatitis reactions within 48 hr to padauk and cocabolla. An aqueous saline specific desensitizing vaccine from these woods was prepared by the Bencard Allergy Unit. A 2% solution of each gave immediate weal and flare reactions with itching on prick testing which subsided in 3 hr. There was no type III reaction. A course of eighteen injections was given, without incident. A sawdust patch test with cocabolla was also negative. He noticed improvement in his asthmatic symptoms about half way through his course of injections and was asymptomatic at the conclusion of the treatment.

He was not exposed to cocabolla again as its use was discontinued at this time, but he continued to work with padauk and other timbers without symptoms. He had given up spontaneously his previous palliative medicaments which included disodium cromoglycate.

Case 2

Mrs A.Y., aged 38, was an asthmatic of very long standing. Since taking up employment she noticed sneezing, watery nasal discharge and frontal headaches. She was never free of wheeze. Rhonchi were invariably present in all zones. Her FVC was 1.8 litres and FEV 1.0 litres. A chest X-ray was done at this time. Skin testing showed negative reactions to animal furs and house dust. Patch testing with timbers from her work also gave negative results. Nasal insufflation of powdered sawdust (mixed padauk, cocabolla and ebony) to one inferior turbinate caused nasal obstruction within 60 sec. She was advised to change her employment and is now working in a rubber goods factory as a packer.

Since leaving the billiard cue factory she has had no severe exacerbations, and reports an increased exercise tolerance.

Case 3

Mrs L.H., aged 44, was employed as a sander and soon afterwards began to notice

persistent coryza, sore nose and a dry cough. Wearing an industrial face mask gave her no protection. She developed patches of dry red dermatitis below both eyes within 9 months. Patch testing gave positive contact dermatitis reactions to sycamore, and to a lesser extent to cocabolla, and negative to padauk, rosewood, ebony and purple-heart. These results did not coincide with the patient's own views on the timbers which caused her most trouble, in that she was sure that cocabolla and ebony were the chief irritants, and did not think that sycamore had ever troubled her. Nasal provocation tests gave a very marked reaction to both cocabolla and ebony, and a doubtful response to sycamore and no response to any of the other timbers with which patch testing had been performed.

Prick testing with a 2% cocabolla aqueous extract gave an immediate weal and flare with irritation which subsided in 3 hr.

A course of eighteen injections of cocabolla extract was given. At the time of the fourth injection, after handling cocabolla more than usual, she experienced an exacerbation of her dermatitis around the eyes and neck, which subsided within a week on a topical steroid cream. The course of injections was completed uneventfully.

She lost her dermatitis completely and was able to work without nasal symptoms provided she used an industrial face mask. However, she still experiences a mild rhinitis if she attempts to sand wood without it. A prick test to 2% cocabolla test solution is now negative.

Discussion

Three patients with respiratory symptoms attributed to allergy to cocabolla are presented. One gave a dermatitis response on patch testing, and two immediate weal and flare on prick testing with an aqueous 2% solution. Skin testing with this extract on atopic subjects not exposed to cocabolla was negative in ten cases, and also negative in ten non-atopic cases not exposed to this timber.

Injection treatment in these two cases with aqueous extracts of padauk and cocabolla in one and cocabolla in the other was followed by the disappearance of immediate skin sensitivity on prick testing with extracts of cocabolla in both and padauk in one. Contact dermatitis reaction on patch testing also disappeared. There appeared to be clinical improvement as well.

The nature of the allergen in cocabolla is considered by Zafiropoulo, Audibert & Charpin (1968). They draw attention to makoré saponin, inferring that other woods have saponins with similar properties, but there is some doubt about this, because these are a large and varied group of compounds, and the dalbergiones present in cocabolla (Zafiropoulo *et al.*, 1968) are quinones. The dalbergiones were said to be skin irritants, but no references are given to support this.

The possibility that the dalbergiones are the allergenic factor in cocabolla in respiratory as well as skin allergic reactions should be considered. Little is known about them, but much more will have to be established about their chemistry, solubility basis and other properties. In the meantime the listed evidence available suggests that attempts at hyposensitization with aqueous solutions may be helpful.

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