

Airborne contact dermatitis induced by parthenium: a study of 50 cases in South India

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Summary

Airborne contact dermatitis (ABCD) is a commonly occurring form of allergic contact dermatitis with varied aetiology, often posing a diagnostic challenge in management. A study was carried out on patients with a clinical picture and history consistent with ABCD due to exposure to *Parthenium hysterophorus* (parthenium weed), who were patch tested. There were 50 patients with parthenium-induced ABCD (36 men and 14 women; age range 24–75 years). The majority (90%) of the patients were farmers and most of the patients (74.5%) had exacerbations during summer. The most common type of dermatitis was the classic pattern (46%) followed by the mixed pattern (30%), erythroderma (14%) and chronic actinic dermatitis (10%). Of the 40 cases patch tested with the Indian standard series of antigens, 36 (90%) cases had patch-test results positive for parthenium.

Compositae dermatitis affects 0.7–1.4% of the general population (4.5% of occupationally exposed groups) and is one of the top 10 sensitivities in Europe.¹ Contact dermatitis due to the plant *Parthenium hysterophorus* (parthenium weed) is a major dermatological problem in India and is the commonest cause of airborne contact dermatitis (ABCD),² which can present in a varied spectrum of clinical patterns.^{3,4} This hospital-based prospective study was undertaken to evaluate the clinical profile of patients with ABCD induced by exposure to parthenium and to confirm the causative allergen by patch testing with the Indian standard series of antigens.

Report

All patients with a clinical picture and history consistent with ABCD secondary to exposure to parthenium were included in the study. In every case, a detailed history

was elicited with special reference to the presence of parthenium in the vicinity of the home or workplace, seasonal variations and remissions when away from the inducing allergen. Clinically, patients with ABCD were classified into four types:⁵ (i) a classic pattern [diffuse dermatitis involving the face especially the upper eyelids, flexural areas of the extremities (Fig. 1), and sides of the neck]; (ii) a chronic actinic dermatitis (CAD) pattern [lichenified papules and plaques or nodules localized to the exposed areas, such as the forehead, the rim of the ears, the cheeks, anterior chest, nape of the neck, dorsa of the forearms and the hands (Fig. 2)]; (iii) a mixed pattern [scattered infiltrated scaly papules over the exposed parts along with dermatitis over the eyelids and flexural areas of the extremities and the neck (Fig. 3)]; and (iv) erythroderma involving > 90% of the body surface area. Patch testing with the Indian standard series including the plant series was performed following the International Contact Dermatitis Research Group (ICDRG) guidelines.⁶

In total, 50 patients with parthenium-induced ABCD (36 men, 14 women; mean age of 52.8 years, range 24–75), were included in the study. Age groups were < 40 years (8 patients), 41–60 years (28) and > 60 years (13). The duration of the dermatitis ranged from 15 days to 15 years (mean 2.2 years). The

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Figure 1 Classic pattern of airborne contact dermatitis due to parthenium involving the cubital fossa.



Figure 3 Mixed pattern of airborne contact dermatitis due to parthenium involving the flexural areas of the neck and exposed parts of the body.



Figure 2 Chronic actinic dermatitis pattern of airborne contact dermatitis due to parthenium.

majority (90%) of the patients were farmers and most of the patients (74.5%) had exacerbations during summer and some during spring (11%). In total, 35 patients (70%) gave a history of photosensitivity. There were 11 patients (22%) with evidence of other allergic disorders: 8 (16%) had allergic rhinitis and 3 (6%) had asthma.

The most common type of dermatitis was the classic pattern (46%) followed by the mixed pattern (30%), erythroderma (14%) and CAD (10%). Of the 40 cases who were patch tested, 36 (90%) had positive results for parthenium. Six (15%) and two (5%) cases each also had positive results to *Xanthium* and *Chrysanthemum*, species, respectively, but all of them had a higher grade of positivity to parthenium.

ABCD is a type of eczematous dermatitis caused by chemicals and various other materials carried in the air. It is essential for doctors to be aware of the various aetiological agents, to take a detailed history, and do the necessary investigations to effectively manage these patients. Parthenium dermatitis has been reported from various countries, including the United States, Mexico, Central and South America, the West Indies, Africa, China, Vietnam and Australia, and is a major dermatological problem in India.⁷

In a study from north India, although parthenium was the commonest cause of ABCD, other species such as chrysanthemum and less commonly dahlia and marigold were also implicated.⁸ In our part of south India, parthenium is the commonest cause of ABCD as it is widespread over both wasteland and cultivated lands. Other Compositae species causing ABCD are rarely seen.

The classic pattern (46%) and the mixed pattern (30%) were the most common clinical types in our study, as most patients were male farmers who worked in the fields with bare limbs and upper torso and were hence exposed to allergens and the sun. Admission alone to the hospital with its parthenium-free environment often improved their dermatitis, which worsened at home after discharge.

Five patients (10%) in our study had the CAD pattern of ABCD with an average duration of 6.75 years, which was much longer than the mean duration (2.24 years) of dermatitis for the entire study group.

Seven patients (14%) with erythroderma had an average age of 61.3 years, compared with the mean age of 52.8 years of the entire study group. They presented to us with generalized exfoliation but gave a history of

lesions suggestive of a classic pattern that exacerbated into erythroderma. The aggravating factor for erythroderma in the majority of our patients (85.7%) was the topical application of native medication, mostly in the form of a green leafy paste with irritant potential. On admission and treatment, these lesions subsided, but relapses and changes of the clinical pattern into other variants were noted later in some cases. Patch testing in three of these patients proved positive for parthenium. Histopathology of the lesions in all seven patients showed features of chronic dermatitis.

Sharma *et al.*,⁵ in a study of 74 cases of parthenium dermatitis from north India, noted the classic pattern in 60 patients, CAD in 9 and the mixed pattern in 5 at the disease onset. Of the 60 patients of classic pattern, 27 developed the CAD pattern and 11 developed the mixed pattern. Shenoi *et al.*,⁹ in a study of 30 cases of parthenium dermatitis from south India, noted the classic pattern in 21 cases, CAD in 4 and mixed pattern in 5 cases. In our study, seven patients (14%) presented with erythroderma, which was not observed in the previous two studies.

To conclude, our study has highlighted the fact that parthenium-induced ABCD commonly occurs in south India, more often in adult men in the 40–60 year age group who were farmers by occupation. The Indian standard series of antigens was effective in detecting parthenium as the causative allergen in these patients.

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