

CONTACT POINT

Evaluation of 2%, 1%, and 0.5% parthenium acetone extracts to diagnose parthenium contact allergy

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INTRODUCTION

Patch tests are the gold standard to diagnose contact allergy to *Parthenium hysterophorus*. The Indian standard patch test series did not include a parthenium allergen initially; therefore, aqueous plant extracts impregnated on filter paper discs have been used instead.¹ Although our baseline series (Chemotechnique Diagnostics, Vellinge, Sweden) includes sesquiterpene lactone mix 0.1% pet. and parthenolide 0.5% pet., both have been found to be less sensitive as compared with plant extracts to diagnose parthenium dermatitis.² Besides aqueous extracts, parthenium acetone extracts of 1% and 0.5% have been used for patch testing.³

In this study we evaluated 2%, 1%, and 0.5% parthenium acetone extracts to determine the most suitable patch test concentration to diagnose parthenium contact allergy.

MATERIALS AND METHODS

The patch test preparations were prepared by mixing 50 g of dehydrated plant leaves powder in 500 mL of acetone as a solvent, followed by filtration, and preparing 2%, 1%, and 0.5% concentrations in acetone as a vehicle, according to the method standardized in our laboratory.³

A total of 40 patients with a clinical diagnosis of parthenium dermatitis were patch tested with the three different acetone extracts; no controls were included. The patches were applied for 2 days and readings were performed on day (D) 2 and D4, according to ICDRG guidelines. The patch test positivities to the three different concentrations, on D2 and D4, were compared using the McNemar test.

RESULTS

The patch test positivity with 2%, 1%, and 0.5% was 75%, 60%, and 57.5%, respectively, on D2, which increased to 85%, 75%, and 72.5%, respectively, on D4. The patch test positivity was highest with the 2% concentration on both D2 and D4. It was significantly higher with 2% as compared with 1% on D2 ($P = .041$), and also as compared with 0.5% ($P = .023$). Furthermore, on D4 the patch test positivity was higher with 2% as compared with 1% ($P = .134$) and 0.5% ($P = .07$), although this was statistically not significant (Table 1).

DISCUSSION

Parthenium dermatitis is the most common cause of airborne allergic contact dermatitis in India, and accounts for about 40% patients

TABLE 1 Patch test positivity to 2%, 1%, and 0.5% of parthenium acetone extracts in 40 patients with a clinical diagnosis of parthenium dermatitis (N=40)

Patch test reading time	Concentration		
	2%	1%	0.5%
Day 2, n (%)	30 (75)	24 (60), $P^* = .041$	23 (57.5), $P^* = .023$
Day 4, n (%)	34 (85)	30 (75), $P^* = .134$	29 (72.5), $P^* = .07$

Bold values are statistically significant ($P < 0.05$).

Abbreviations: n, number of patients reacting positively.

* P -values provided for comparison with the 2% concentration.

attending patch test clinics.⁴ The diagnosis of parthenium dermatitis is based on the recognition of various clinical presentations, and patch tests with plant extracts. Pasricha and Singh¹ reported the use of antigen-impregnated discs prepared from aqueous extracts of dried parthenium leaves for patch testing, and found them noninferior to standard antigens. A subsequent study showed a lower patch test positivity rate (62.5%) with aqueous extracts as compared with 1% and 0.5% acetone extracts (93%-100%).³ Mahajan et al² compared parthenolide 0.5% pet. with parthenium aqueous extracts (1%), which showed positivity in 46% and 86% of patients, respectively. The poor positivity with parthenolide could be due to its absence as an allergen in the plant parthenium, although it might cross-react with sesquiterpene lactones present in the plant.

In a study by Verma et al,⁵ 2% plant acetone extracts showed 100% positivity as compared with lower concentrations of 1% and 0.5% (90.9% positivity each), after a 12-hour occlusion time. In our study, 2% parthenium acetone extracts showed a maximum positivity as compared with the lower concentrations, although the difference was statistically not significant. Overall, 2% parthenium acetone extracts thus appear to reliably detect contact allergy to parthenium, whereas the lower concentrations (1% and 0.5%) might miss some sensitized patients. It might be apprehended that 2% parthenium acetone extracts occasionally provoke irritant reactions, although morphologically (according to ICDRG guidelines) we did not encounter such reactions. Nevertheless, our data are preliminary, and larger studies with an adequate sample size and a control group should be performed in the future.

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AUTHOR CONTRIBUTIONS

Rhea Ahuja: Data curation; formal analysis; investigation; writing-original draft; writing-review & editing. **Nikhil Mehta:** Formal analysis;

supervision; writing-original draft; writing-review & editing. **Kaushal Verma:** Conceptualization; data curation; investigation; resources; supervision; writing-original draft; writing-review & editing. **Himabindu Saginatham:** Data curation; investigation.

CONFLICTS OF INTEREST

None declared.

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