**Parthenium Dermatitis Severity Score to Assess Clinical Severity of Disease**

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**Abstract**

**Background:** Parthenium dermatitis is the most common type of airborne contact dermatitis in India. It is a chronic disease of a remitting and relapsing course with significant morbidity and distress, but there is no scoring system to assess its severity. **Aim:** To design a scoring system for the assessment of clinical severity of disease in Parthenium dermatitis and to use this scoring system in various studies to determine its sensitivity, specificity, and reproducibility. **Methods and Results:** In our first few studies on Parthenium dermatitis, we designed and used a basic clinical severity scoring system based on itching, morphology of the lesions, and areas involved. However, in subsequent studies, we modified it to the present scoring system as Parthenium dermatitis severity score (PDSS). Our studies showed the high sensitivity of PDSS in characterization of the disease severity at the given point of time, as well as to determine the efficacy of a prescribed treatment modality which was reliable and reproducible. **Conclusion:** Thus, PDSS may be used by clinicians for appropriate scoring of the clinical severity of Parthenium dermatitis and in monitoring the disease response to therapy.

**Key Words:** Parthenium dermatitis, score, severity

**Introduction**

Treatment decisions in clinical practice are often guided by the severity of the disease, and the assessment of disease severity remains an important measure for planning treatment strategies. It also helps in monitoring the treatment response and maintains objectivity in observations.[1]

Parthenium dermatitis is an allergic dermatitis, which occurs due to sensitization to the plant *Parthenium hysterophorus*. It is the most common type of airborne contact dermatitis in India, which is reported to affect about 40% of the patients attending contact dermatitis/allergy clinic at various centers. The disease primarily affects the exposed parts of the body, such as the face, neck, “V” area of the chest, upper back, forearm, and feet and manifests as itchy papular lesions, which may coalesce to form plaques with a variable degree of inflammation.[2] Parthenium dermatitis is a chronic disease of a remitting and relapsing course and is associated with significant morbidity and distress, but there is no scoring system to assess its severity.

**Aim**

To design a scoring system for the assessment of clinical severity of disease in *Parthenium* dermatitis and to use this scoring system in various studies to determine its sensitivity, specificity, and reproducibility.

**Methods and Results**

In our first few studies of *Parthenium* dermatitis, we used a basic clinical severity scoring system (CSS) which was recorded on a ten-point scale with three points each given for itching (0 - no itching, 1 - mild, 2 - moderate, and 3 - severe itching), morphology of the lesion (0 - no lesions, 1 - papules, 2 - plaques, and 3 - lichenified plaques), and four points for areas involved (1 - only face, 2 - face, neck and hands, 3 - all...
exposed sites and flexures, and 4 - erythroderma). The total score \((a + b + c)\) was multiplied by ten to get a total CSS of 100.\[^{[2,3]}\] We reviewed 42 patch test confirmed cases of *Parthenium* dermatitis and determined their CSS using this scoring system (mean: 35.47 ± 19.41). Patients were treated with different dosage schedules of azathioprine and were followed up every month for a varying period of 4 months to 69 months to determine any change in the CSS in response to therapy. At the end of the study, most patients had remission, and there was a significant decrease in the severity of the disease in remaining patients. The mean CSS decreased from 35.47 ± 19.41 to 4.76 ± 9.43 \((P = 0.002)\) which correlated well with the clinical improvement in the disease.\[^{[2]}\] We subsequently used this scoring system in a randomized controlled trial of 55 *Parthenium* dermatitis cases and recorded their baseline CSS (Group A, \(n = 26: 64.5 ± 16.37\), Group B, \(n = 29: 67.14 ± 17.36\)). Group A patients received azathioprine 100 mg daily and Group B received betamethasone 2 mg daily for 6 months. The CSS decreased from 64.5 ± 16.37 to 4.3 ± 5.57 \((P = 0.0156)\) in Group A and from 67.14 ± 17.36 to 0.59 ± 2.22 \((P = 0.0005)\) in Group B following treatment, and this correlated with the excellent clinical improvement in both the groups.\[^{[3]}\]

However, later we realized that the area of involvement details was not getting adequately represented in the first scoring system, so we modified it to the present scoring system named *Parthenium* dermatitis severity score (PDSS). To calculate the PDSS, (a) itching and (b) erythema were graded on a scale of 0–3 (0 - nil, 1 - mild, 2 - moderate, and 3 - severe) and (c) morphology of lesions was graded on a scale of 0–5 (0 - no lesions, 1 - papules, 2 - plaques, 3 - lichenified papules, 4 - lichenified plaques, and 5 - exudative lesion). (d) areas of the body involved were assessed and a score of 1 was given to an approximate area of 9% body surface involvement. The PDSS was calculated by adding (a), (b), (c), and (d) and multiplying it by three to get a maximum score of 99 or \(\approx 100\) [Table 1]. Hence, a patient having severe disease with extensive involvement will have a PDSS of 100.

### Discussion

PDSS may be used to objectively grade the disease as mild, moderate, and severe. The disease is considered to be mild if the PDSS is <50, moderate if it is 50–75, and severe when the PDSS is >75. The grading is further useful in deciding the treatment options and in monitoring the response to therapy. We used this new scoring system in our subsequent studies on *Parthenium* dermatitis.

In a study of 12 *Parthenium* dermatitis cases, baseline CSS was assessed using this modified scoring system (PDSS) and was found to be in a range of 29.7–55.5 (mean ± standard deviation [SD]: 40.40 ± 7.95). These patients were treated with 300 mg azathioprine once-weekly doses for 6 months. At the end of

| **Table 1: Parthenium dermatitis severity score assessment** |
|----------------------------------------------------------|
| **Component** | **Severity score** |
| Itching       |                |
| Nil           | 0              |
| Mild          | 1              |
| Moderate      | 2              |
| Severe        | 3              |
| Type of lesions |       |
| Papules      | 1              |
| Plaques      | 2              |
| Lichenified papules | 3  |
| Lichenified plaques | 4  |
| Exudative lesions | 5  |
| Erythema     |                |
| Nil          | 0              |
| Mild         | 1              |
| Moderate     | 2              |
| Severe       | 3              |
| Areas of involvement |     |
| Face         |                |
| Forehead     | 0.2            |
| Cheeks R and L | 0.2 each       |
| Nose and chin | 0.1 each       |
| Periorbital areas R and L | 0.05 each |
| Ears and retroauricular areas R and L | 0.1 each |
| Neck         |                |
| Anterior and posterior (each) | 0.2 each |
| Scalp        | 0.7            |
| Upper limbs  |                |
| Dorsae of hands R and L | 0.2 each |
| Flexors of forearms R and L | 0.4 each |
| Extenors of forearms R and L | 0.4 each |
| Flexors of arms R and L | 0.4 each |
| Extenors of arms R and L | 0.4 each |
| Shoulders R and L | 0.2 each |
| Chest        | 2              |
| Abdomen      | 2              |
| Back         |                |
| Upper and lower | 2 each       |
| Lower limbs  |                |
| Dorsae of feet R and L | 0.2 each |
| Anterior aspects of leg R and L | 0.8 each |
| Posterior aspect of leg R and L | 0.8 each |
| Poppiteal fossae R and L | 0.1 each |
| Anterior aspects of thigh R and L | 1 each   |
| Posterior aspects of thigh R and L | 1 each   |
| **Total score = (A + B + C + D) × 3** | **Maximum PDSS - 99** |

PDSS: *Parthenium* dermatitis severity score, R and L: Right and left
6 months of treatment, the PDSS became zero in all four patients who had 100% improvement, whereas it reduced significantly (mean ± SD from 40.40 ± 7.95 to 10.9 ± 8.43; \( P = 0.002 \)) in other patients who had good to excellent (>60% clearance) improvement.\(^4\) We again evaluated this scoring system in another randomized controlled trial of sixty patients of *Parthenium* dermatitis, and the score was 26.4 ± 14.5 in Group 1 and 36.1 ± 18.1 in Group 2 at baseline. These patients were treated with azathioprine 300 mg weekly pulse or azathioprine 100 mg daily for 6 months. After 6 months of treatment, the PDSS decreased from 26.4 ± 14.5 to 4.7 ± 5.1 in the Group 1 and from 36.1 ± 18.1 to 5.7 ± 6.0 in the Group 2 and this change in the severity score correlated with good to excellent clinical improvement in both the groups.\(^5\) Thus, PDSS has been found to be a valuable tool in determining the severity of the disease which was reliable and reproducible although the scoring system has not been evaluated in large studies.

**Conclusion**

Therefore, we recommend that PDSS may be used by clinicians for appropriate scoring of the clinical severity of *Parthenium* dermatitis, as well as monitoring the disease response to therapy.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

**What is new?**

We designed a scoring system to determine clinical severity of the disease in patients of *parthenium dermatitis* as *parthenium dermatitis severity score* (PDSS).

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