

Contact dermatitis due to *Parthenium hysterophorus*

Mohd. Afaq Siddiqui, Ratan Singh and R.C. Sharma

*Department of Dermatology and Venereology,
Maulana Azad Medical College, New Delhi.*

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Of 90 cases of dermatitis suspected to be caused by plants studied, 24 (26.66 per cent) were proved to be due to the weed *Parthenium hysterophorus*. The percentage incidence of parthenium dermatitis in relation to contact dermatitis due to all other causes was 3.83 per cent. The incidence of parthenium dermatitis in rural group (29.4 per cent) was almost the same as that of the hospital alone (25 per cent) in which the study was conducted. Majority of the cases of contact dermatitis due to *Parthenium hysterophorus* were between 31 and 60 years of age. There were 19 (79.16 per cent) males and 5 females (20.84 per cent). The disease was not seen before the age of 16 years. A large number of the subjects (41.67 per cent) were farmers and farm workers. Others included housewives, office workers, mechanics, etc. A definite or suggestive history of exposure to *Parthenium hysterophorus* was elicitable in almost all the cases. The avenues of exposure included environment of field crops, wasteland and kitchen garden infested with the weed. The clinical picture consisted of a chronic dermatitis in majority of the cases and it was confined to exposed parts only. The contact dermatitis followed a protracted course with relapses and remissions. Some cases showed seasonal variations. Allergic rhinitis and asthma were not seen in any case.

Parthenium hysterophorus, a member of Helianthese tribe of Compositeae family was known to occur in plant kingdom as early as 1897 when Arny¹ in West Indies described its medicinal values. Shelmire² reported the occurrence of this plant in Texas. In India, this plant was first noticed in Poona³. Ranade³ reported that the seeds of this plant gained entry into our country as an adulterant in the wheat consignment received from the United States of America. The plant found the soil and climatic conditions in India very favourable and within a few years it covered vast tracts of uncultivated land, pastures, side walks of the streets and roads. In Delhi, its appearance was

first noticed by Maheshwari⁴. Singh and Shivpuri⁵ reported that in Delhi, it develops flowers throughout the year. This weed has been given several local names e.g. *Congress grass*, *Chhatak Chandni* and '*Osadi*'.

That *Parthenium hysterophorus* could prove hazardous to human health was first reported by French⁶ who first recorded contact dermatitis due to this weed and named it 'fever few' in the United States. Subsequently it was seen by others also^{7,8}. In India, contact dermatitis due to *Parthenium hysterophorus* was first reported in agriculturists and field workers of Poona by Lonkar and Jog⁹,

and subsequently by several^{3,10,11} others. Ranade³ observed that dermatitis due to *Parthenium hysterophorus* was confined not only to farmers and field workers but was also seen in the 'white collared class' who came in contact with the weed in their newly developed townships and also in those with kitchen gardening as a hobby.

Parthenium hysterophorus has been infrequently reported to have caused hay fever⁸ and allergic rhinitis¹².

Lonkar and co-workers¹⁰ obtained positive patch test results with *Parthenium hysterophorus* leaf and also with parthenin, a sesquiterpene lactone which is responsible for contact dermatitis in sensitized individuals.

Prompted by the various reports in the recent past publicised through the mass media in our country regarding the menace of *Parthenium hysterophorus* to human health, we undertook a study to investigate the exact magnitude of the problem in Delhi.

Material and Methods

All cases of contact dermatitis suspected to be due to plants and vegetations attending the Skin Out-patient Department of Irwin Hospital, New Delhi from June 1976 to February 1977 were screened. Similar cases at the Rural Field Practice Centre, Pooth Khurd, attached to the Maulana Azad Medical College, New Delhi, were also screened and investigated.

The diagnosis of contact dermatitis due to vegetations was made on the basis of the clinical picture including history of exposure, environment, vocation, hobbies and seasonal influence. The diagnosis

was substantiated in each case by patch tests with the suspected vegetations including *Parthenium hysterophorus*.

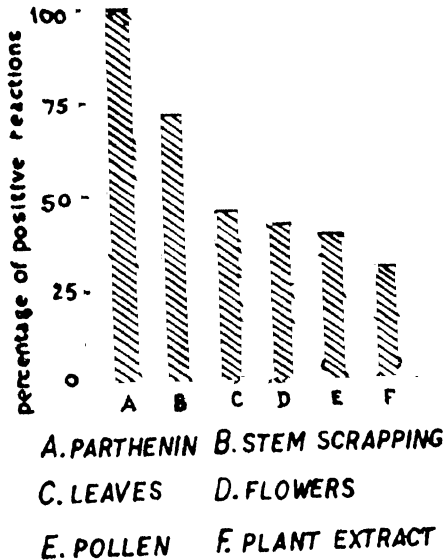
Patch tests were performed with leaves of various plants using standard precautions. Patch tests with various parts of *Parthenium hysterophorus* i.e. pollen, flowers, leaf and stem scrappings were performed on all cases of plant dermatitis. Plant extract was prepared by crushing together various parts of the plant (equal amount by weight) in a mortar and a drop of this extract was used in patch testing. Parthenin, a commercially available antigen (1 : 500 in buffered saline) procured from the V.P. Chest Institute, Delhi, was employed for patch testing, a drop being used in each patch test.

Results of patch test reactions were recorded as described by Schwartz and Peck¹³. Patients who showed negative results to patch test after 48 hours were re-examined daily for the next five days and also on the seventh day. From the same environment, 90 healthy controls were also tested with various antigenic agents used in the patients.

Results and Discussion

Of 618 cases of contact dermatitis due to various causes, vegetations including *Parthenium hysterophorus* were responsible for 90 cases (14.56 per cent) whilst *Parthenium hysterophorus* accounted for 24 cases (3.88 per cent). Fourteen cases were diagnosed at Irwin Hospital and 10 at the Rural Centre. Statistically the difference between the rural and the urban groups was not significant ($P > 0.05$). *Parthenium hysterophorus* alone was responsible for 26.66 per cent (24 cases) of the cases of plant dermatitis.

FIG. I. HISTOGRAM SHOWING PATCH TEST RESPONSE TO VARIOUS PARTS OF THE PLANT IN CASES OF CONTACT DERMATITIS DUE TO *PARTHENIUM HYSTEROPHORUS*.



Of the 24 patients found sensitive to *Parthenium hysterophorus* 8 subjects were in the 41-50 years age group, 5 cases in 31-40 years age group, 4 cases in 51-60 years age group and 2 cases each in 11-20, 21-30 and 61-70 years age groups, while one subject was above 70 years of age. There was no case below the age of 16 years. Lonkar and associates¹⁰ had similar observations.

Of 24 cases of contact dermatitis due to *Parthenium hysterophorus*, 10 were farmers and farm workers, 3 housewives and 2 labourers employed by the local administration for manual uprooting of *Parthenium hysterophorus*. Among the other subjects were a hawker, a fruit merchant, retired official, cart driver, confectioner, peon, carpenter, mechanic

and store inspector respectively indicating that parthenium dermatitis is not confined to agricultural community only.

The dermatitis was acute in 4 cases, sub-acute in 7 cases and chronic in 13 cases. In 3 cases, the dermatitis had progressed to erythroderma.

The face was involved in 13 cases, neck in 11 cases, upper chest in 14, trunk in 4, abdomen in 2 and the back in 3 cases. In the upper extremity, the extensor and flexor surfaces were involved equally in 18 cases and the cubital fossa in 11 cases. In the lower extremity the extensors were involved in 20 cases, flexors in 18 and popliteal fossa in 10 cases.

The distribution pattern of chronic cases simulated atopic dermatitis of the adult type, but there was no history of atopy in the family nor was there any evidence of allergic rhinitis or asthma. A similar observation was made by Lonkar and Jog⁹. Kahn and Grothaus⁷ have emphasized that the pollen of *Parthenium hysterophorus* is so sticky and adherent to the plant that it can seldom cause hay fever.

Seven patients had seasonal recurrence, 3 each in winter and summer and one in the rainy season. Four patients gave history of relapse on going back to work in the fields.

Use of various parts of the plants for patch tests revealed that pollen gave positive results in 9 (37.5 per cent) cases, flowers in 10 (41.66 per cent) cases, leaves in 11 (45.6 per cent) cases and stem scrappings in 17 (70.8 per cent) cases. The plant extract showed positive test only in 7 (29.1 per cent) cases. This is at variance with other studies and can be

attributed to the fact that the oleoresin content of the plant varies according to the growth, stage of development and cultural conditions of the plant, being highest in the pollinating season^{2,14}.

None of the controls showed any reaction to the antigenic material used for patch testing. Therefore the reaction in the patients could not be attributed to an irritant effect.

Parthenin gave positive patch test response in all the 7 (100 per cent) cases tested. Lonkar and associates¹¹ have shown that Parthenin is a sesquiterpene lactone which is the major allergen responsible for contact dermatitis.

Acknowledgment

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Reprint requests : Dr. Ratan Singh, Prof. of Dermatology and Venereology, Maulana Azad Medical College, New Delhi-110002.