Indian J Med Res 68, October 1978, pp 650-655

Plant dermatitis in Delhi

Ratan Singh, Mohd. Afaq Siddiqui and M.C. Baruah

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

Received February 22, 1978; revised article received April 28, 1978.

Out of 618 cases of contact dermatitis due to various contactants, plant dermatitis was seen in 90 cases (14·56 per cent). Majority of the patients were farmers in the age group of 41-50 years. Definite history of contact with the plants could be elicited in 60 per cent of the cases. The clinical picture of plant dermatitis was that of chronic dermatitis affecting exposed parts with seasonal relapses and remissions. Majority (82·22 per cent) of the cases of contact dermatitis due to plants showed positive patch test reactions to one or the other plants. Maximum number of positive patch tests was observed with *Parthenium hysterophorus* (26·66 per cent).

It is now well established that certain individuals can be sensitized to ordinary substances of daily use and reaction produced in them on subsequent exposures. Plants and vegetations are no exceptions and a large number of them have been identified to cause eczematous reaction in human beings. Almost any plant can prove to be a sensitizer in a susceptible individual.

The incidence of contact dermatitis due to plants is expected to be high in a predominantly agricultural country like India. The problem is much more common than realised as the majority of the farmers and farm workers do not often get an opportunity to reach the specialists. The incidence of phytodermatitis and the offending plants will vary from place to place depending upon the vocation and hobby of the individuals and the flora in a particular locality. We planned to study the problem of contact dermatitis due to plants in Delhi and identify the plants responsible for it.

Material and Methods

All clinically suspected cases of contact dermatitis due to plants attending the Dermatology Out Patients' Department of Irwin Hospital, New Delhi between June 1976 and February 1977 were taken up. Such cases were also screened and investigated at the Rural Field Practice Centre, Pooth Khurd, attached to the Maulana Azad Medical College, New Delhi. The diagnosis of contact dermatitis due to plants and vegetations was made from an overall clinical picture based on history of exposure, environment, vocation and hobby and seasonal influence. The diagnosis was substantiated in each case by patch test with suspected vegetations. However, every case was tested with patch material containing various parts of *Parthenium hysterophorus*. The identification of the plant was done in consultation with Dr. R.K. Arora of Plant Introduction Division, Indian Agricultural Research Institue, New Delhi.

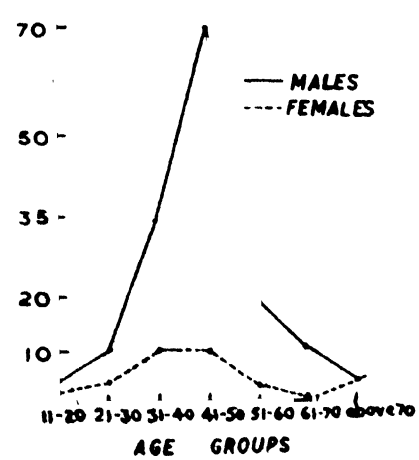
Standard patch tests were performed on grossly normal, non hairy skin of the back. Plant leaves cut to small pieces were crushed in a mortar with normal saline and used for patch test as such. Results of patch tests were recorded as described by Schwartz and Peck[1]. A control patch test with normal saline was also applied in each case. Control patch tests with all the suspected plant materials were performed on a few normal healthy individuals. For *Parthenium hysterophorus*, the control tests were done on 90 normal healthy individuals drawn from the same locality. None of them showed positive result. 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.

Results and Discussion

During the period of this study, 22,524 new patients attended the Dermatology Out-patients' Department of Irwin Hospital. Of these, 618 (2·7 per cent) were diagnosed as cases of contact dermatitis due to various contactants. Earlier, Baruah[2] had also observed almost the same incidence (2·2 per cent) of contact dermatitis in this Institution. Contact dermatitis due to plants was seen in 90 cases and constituted 0·4 per cent of the out patient attendance of the Department of Dermatology. Out of 618 cases of contact dermatitis due to various causes, plants were responsible for 90 (14·5 per cent) cases. From the same institution, Behl and associates[3] had reported the incidence of contact dermatitis due to vegetations as 4·6 per cent out of a total of 172 cases of contact dermatitis due to various causes. The increased incidence in the present study might be due to increased healthy consciousness in the population and also to better diagnostic facilities now available in Irwin Hospital where a full-fledged Allergy Clinic has been functioning for the last 8 years.

Age, sex, occupation, hobbies and history of contact with plant : Of 90 cases, 3 (3·3 per cent) were in the age group of 11-20 years; seven (7·7 per cent) were in the age group of 21-30 years. Age group of 31-40 years had 22 (24·4 per cent) cases. Forty (44·4 per cent) cases were seen in the age group of 41-50 years. The age groups of 51-60 and 61-70 had 9 (10 per cent) and 5 (5·5 per cent) cases respectively. There were 4 (4·4 per cent) cases beyond 70 years of age. As shown in the Fig. 1 the incidence of phytodermatitis steadily increased with age reaching a peak in the age group 41-50 years. It was uncommon at the extremes of the age. Epstein[4] also observed highest incidence in

FIG. CONTACT DERMATITIS DUE TO VEGETATIONS IN DIFFERENT AGE GROUPS OF MALES AND FEMALES.



group of 40-65 years. Rook[5] and Lonker and associates[6] also found phytodermatitis to be very uncommon in children.

Of the 90 cases of contact dermatitis due to plants in our series 73 (81·1 per cent) were males and 17 (18·8 per cent) were females, the male : female ratio being 4·3 : 1. Of the 90 cases of contact dermatitis due to plants, 38 (42·2 per cent) cases were farm workers and farmers; 9 (10 per cent) were housewives; 4 (4·4 per cent) each were labourers; hawkers, retired persons and cart and truck drivers; whereas 2 (2·2 per cent) each were dairy workers, businessmen, clerks, beat postmen and traders. Fruit merchants, peons also constituted 3 (3·3 per cent) each. Others belonged to the miscellaneous occupations.

Fifty seven (63·3 per cent) subjects had no hobby. Sixteen (17·7 per cent) stated that their hobby was cattle breeding. Some of them took regular morning walk and attented to kitchen gardening.

History of contact with plants : Sixty per cent of the cases gave a definite history of contact with plants preceding the development of their complaints. In 34 patients, the history was suggestive of contact with plants while in two (2·2 per cent) cases there was no history of contact with vegetations. Majority of the cases, *i.e.* 52 (57·7 per cent) of contact dermatitis due to plants were exposed to an environment of field crops.

Clinical features : The clinical presentation of the patients was variable. Sixteen (17·7 per cent) cases presented in an acute stage; 30 (33·3 per cent) in subacute stage and 44 (48·8 per cent) in the chronic stage. Four (4·4 per cent) cases progressed to erythroderma.

In the upper extremity, flexor and extensor surfaces were involved in 68 (75·5 per cent) and 67 (74·4 per cent) cases respectively, whereas the corresponding figures for the lower extremity were 48 (53·3 per cent) and 56 (62·2 per cent) respectively.

Fifty three (58·8 per cent) cases gave a history of relapse; in 37 (41·1 per cent) the attack was the first one and they had not experienced any relapse. Of 53 patients having a relapse, 28 (31·1 per cent) had seasonal relapse, 14 (15·5 per cent) in winter, 9 (10 per cent) in summer and 5 (5·5 per cent) in the rainy season. This can be attributed to the fact that the concentration of oleoresins responsible for dermatitis is higher in plants during pollinating season[7]. Further, the vigour of growth and cultural conditions also influence the relative amount of these substances present at any given time[8]. In 16 (17·7 per cent) cases the relapse was not related to any season. These patients reported re-activation of dermatitis on going back to the work. In 9 (10 per cent) cases, the cause of relapse could not be ascertained; perhaps because plants are so benign in nature that one hardly takes notice of casual, occult contact with them.

History of atopy and other allergic disorders was not obtained in any of the patients. Systemic examination did not reveal any evidence of allergic rhinitis, hay fever or asthma.

Patch test : The results of patch test with different suspected plants are given in Table I. Seventy four (82·2 per cent) cases showed positive results to one or the other of the suspected plants. Sixteen (17·7 per cent) cases showed

TABLE I. THE RESULTS OF PATCH TEST WITH VARIOUS PLANT MATERIALS.

S. No.	Plants used for patch testing	Patch test			
		Number of patients	Number positive	Percentage	% in relation to 90 cases of plant dermatitis
1.	*Parthenium hysterophorus* (carrot grass)	90	24	26·66	26·66
2.	*Pennisetum typhoides* (Bajra)	42	3	7·14	3·33
3.	*Sorghum bicolor* (Jowar)	45	6	13·33	6·66
4.	*Argemone mexicana* (Kateli)	20	2	10·00	2·22
5.	*Mangifera indica* (Mango)	10	1	10·00	1·11
6.	*Cynodon dactylon* (Dog grass)	69	9	13·04	10·00
7.	*Cyprus rotundus* (Motha)	17	0	0	0
8.	*Oryza sativa* (Rice)	7	0	0	0
9.	*Abelmoshus esculantus* (Bhindi)	5	1	20·00	1·11
10.	*Lawsonia innermis* (Mehndi)	6	1	16·66	1·11
11.	*Spinacea oleracea* (Palak)	4	0	0	0
12.	*Vinca rosea* (Sadabahar)	11	0	0	0
13.	*Ocimum sanctum* (Tulsi)	4	0	0	0
14.	*Nerium odorum* (Kaner)	8	3	37·50	3·33
15.	*Erigenon canadensis* (Kasish)	7	0	0	0
16.	*Ricinus communis* (Castor)	15	3	20·00	3·33
17.	*Azadirachta indica* (Neem)	3	0	0	0
18.	*Jasmine dambac* (Jasmin)	4	1	25·00	1·11
19.	*Calatropis procera* (Ak)	6	←"Irritant dermatitis"→		
20.	*Tagetes patula* (Genda)	14	3	21·42	3·33
21.	*Xanthium strumorium* (Kutia)	24	7	29·16	7·77
22.	*Euphorbia hirta* (Dudhi)	18	2	11·11	2·22
23.	*Amaranthus viridus* (Jungli cholai)	40	4	10·00	4·44
24.	*Acacia jacquemontii* (Kikar)	25	4	16·00	4·44
25.	*Brassica juncea* (Sarson)	3	1	33·33	1·11
26.	*Triticum aestivum* (Wheat)	18	3	16·66	3·33
27.	*Zia mays* (Macca)	29	6	29·69	6·66
	Total	90	74	82·22	82·22

no reaction to patch test with all the suspected vegetations tested. Duperrat[9] also observed that about 20-25 per cent cases of skin allergies go undetected even in the best equipped hospitals in spite of most searching and strenuous efforts at detection and diagnosis. Sensitivity to parthenium alone formed 26·6 per cent cases of contact dermatitis due to vegetations. Dog grass (*Doob*; *Cynodon dactylon*) gave 13·3 per cent positive patch test restuls.

As shown in Table II, 10 (11·1 per cent) cases were sensitive to more than one plant. Parthenium sensitivity was

TABLE II. POSITIVE PATCH TEST TO MORE THAN ONE PLANT.

Patch test positive to more than one vegetation	Number of patients tested	Number of patients showing positive reaction	Percentage in relation to 90 cases of plant dermatitis
Parthenium + dog grass	69	3	3·33
Parthenium + marigold	14	1	1·11
Parthenium + jowar	45	1	1·11
Jowar + bajra	40	1	1·11
Jowar + maize	23	1	1·11
Jowar + dog grass	35	1	1·11
Dog grass + *jungli cholai*	29	1	1·11
Maize + xanthium	5	1	1·11

accompanied by grass sensitivity in three (3·3 per cent) cases, *genda* (marigold) in one case (1·1 per cent) and *jowar* (maize) in one case (1·1 per cent). *Jowar* sensitivity was associated with *Bajra*, maize, grass, in one case each. All of these cases seem to be due to multiple specific sensitivity rather than of cross sensitivity. When grass was used for patch testing on 20 parthenium sensitive patients, 3 of them gave positive results. In case of cross sensitivity all of them should have given positive results. Further, both grass and parthenium belong to two different families *viz.* Gramineae and Compositeae respectively.

Marigold or *genda* (*Tagetes patula*) a member of the Compositeae family gave positive patch test in 3 out of 14 patients where it was tested (Table I). Simultaneous sensitivity to Marigold and *Parthenium hysterophorus* both belonging to Compositeae family was seen in one case only. According to Mitchell[10], cross sensitivity is common in the Compositeae family, although Shelmire[11] has demonstrated a high degree of specificity in plant dermatitis. Patients sensitive to 1 : 1,00,000 parthenium extract gave negative results to 1 : 10 extracts of 68 other weeds. *Xanthium stromorium* again a member of Compositeae family, growing in apparent competition with *Parthenium hysterophorus* according to Khatri and Chenulu[12] did not show any cross sensitivity with *Parthenium hysterophorus*, although five parthenium sensitive patients were tested with Xanthium simultaneously (Table II). Sensitivity to *jowar* was found in one case of parthenium sensitivity, although it was used for patch testing in 45 patients of contact dermatitis due to vegetations and 13 cases of contact dermatitis due to *Parthenium hysterophorus*. It appears that *jowar* (Sorghum bicolor) has a low sensitizing potential. Positive reactions to more than one plant seen in combinations of *Jowar* and *bajra* (one in 40), *jowar* and maize (one in 23), jowar and dog grass (one in 35) dog grass and *jungli cholai* (one in 29) and maize and Xanthium (one in 5) similarly appear to be instances of specific multiple sensitivities

only. This is quite understandable because it is known that a dermatitic skin is more prone to develop sensitization to various environmental substances to which the patient is exposed. This phenomenon could explain 2 per cent positivity with Xanthium in parthenium dermatitis cases of Lonkar and associates[6]. Similarly, multiple specific sensitivities were observed by Nayyar and Pasricha[13].

Acknowledgment

The authors are thankful to the Medical Superintendent, Irwin Hospital, New Delhi for permission to use the hospital records, and to Dr. R.K. Arora of the Indian Agricultural Research Institute, New Delhi, for identifying the various plants.

References

1. Schwartz, L. and Peck, S.M. The patch test in contact dermatitis. *Public Health Report* **59** (1944) 546.
2. Baruah, M.C. Contact dermatitis in Delhi. *Indian J Derm Vener* (In Press).
3. Behl, P.N., Captain, R.M., Bedi, B.M.S. and Gupta, S. *Skin Irritants and Sensitizing Plants found in India.* (P.N. Behl, New Delhi) 1966, pp. 130, 152.
4. Epstein, S. Role of dermal sensitivity in ragweed. Contact dermatitis. *Arch Derm* **182** (1960) 48.
5. Rook, A. Plant dermatitis in general practice. *Practitioner* **188** (1962) 627.
6. Lonkar, A., Mitchell, J.C. and Calnan, C.D. Contact dermatitis from *Parthenium hystero phorus. Trans St John Hosp Derm Soc* **60** (1974) 43.
7. Fisher, A.A. The role of patch testing in allergic contact dermatitis. In : *Contac dermatitis.* 2nd ed. (Lea and Febiger, Philadelphia) 1973.
8. Rook, A. Plant Dermatitis. The signifi cance of variety specific sensitization. *Br J Derm* **73** (1961) 283.
9. Docteur duperrat. Role of respiratory allergen in dermatology. *Antiseptic* **59** (1962) 599.
10. Mitchell, J.C. Allergic contact dermatitis from compositeae. *Trans St John Hosp Derm Soc* **55** (1969) 174.
11. Shelmire, B. Contact dermatitis from vegetations. *South Med J* **33** (1940) 338.
12. Khatri, H.L. and Chenulu, V.V. *Parthenium hysterophorus. Curr Sci* **35** (1965) 181.
13. Nayyar, K.C. and Pasricha, J.C. Simultaneous manifestations of contact dermatitis to multiple allergens/antigens. *Indian J Der Verner* **38** (1972) 255.

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