



## RESEARCH ARTICLE

## EVALUATION OF ALLERGIC CONTACT DERMATITIS IN AGRICULTURAL WORKERS OF CENTRAL PART OF INDIA BY PATCH TEST

Mohankar Atul, Minakshi Mandhare (Mohankar), Kar Sumit

Dr. Mohankar Atul (M.D)\*, Assistant Professor, Department of Dermatology, Venereology and Leprosy, Chhattishgarh Institute of Medical Sciences (CIMS), Bilaspur, Chhattishgarh, 495001.

Dr. Minakshi Mandhare (Mohankar), Senior RMO, Department of Obstetrics and Gynecology, Apollo Hospitals, Bilaspur, Chhattishgarh, 495006.

Dr. Kar Sumit (M.D), Professor and Head, Department of Dermatology, Venereology and Leprosy, MGIMS, Sewagram, Wardha, Maharashtra- 442102.

Corresponding Author: Dr. Mohankar Atul (M.D)\*, Assistant Professor, Department of Dermatology, Venereology and Leprosy, Chhattishgarh Institute of Medical Sciences (CIMS), Bilaspur, Chhattishgarh, 495001

## ABSTRACT:

**Background:** Allergic contact dermatitis is an inflammatory response of the skin to an exogenous substance, called contact antigen or contactant. Agricultural workers come in contact with several antigens every day starting from plants to chemicals used in fertilizers. Thus contact dermatitis is expected to be a common problem in them. **Aim:** To study the pattern of allergic contact dermatitis among the agricultural workers in Central India. **Results:** Out of total 100 patients of allergic contact dermatitis tested by patch test, only 8% showed positivity to Parthenium hysterophorus in our study. **Conclusion:** Patch testing becomes an important diagnostic tool for the identification of the allergen or allergens responsible for allergic contact dermatitis.

**Key words:** allergic contact dermatitis, patch test, parthenium hysterophorus

## INTRODUCTION:

Allergic contact dermatitis is defined as an inflammatory skin reaction characterized by spongiosis with varying degrees of acanthosis, and a superficial lymphocytic infiltrate<sup>1</sup>. The clinical features include itching, redness, scaling and papulovesicles. A wide range of external and internal factors can induce this condition<sup>2,3</sup>. Allergic contact dermatitis is an inflammatory response of the skin to an exogenous substance which is called contact antigen or contactant. Agricultural workers come in contact with several antigens every day starting from plants to chemicals used in fertilizers. Thus contact dermatitis is expected to be a common problem in them. As human life becomes increasingly complex, especially with pollution all around<sup>4,5</sup>. Agricultural workers are more exposed to allergens as they work in fields, exposed to sun for longer duration and also come in contact with more plants, fertilizers, pesticides. A good clinical study among the rural agricultural workers concerning allergic contact dermatitis was found to be lacking thus this study was taken up.



## METHODOLOGY

This was a prospective investigational study comprising 100 consecutive cases of suspected allergic contact dermatitis (fig :1) in agricultural workers attending the Skin OPD of a tertiary care rural hospital located in central India from November 2010 to May 2012. The study was approved by institutional ethics committee and was done in accordance with Helsinki declaration. Agricultural workers either working part time or full time with allergic contact dermatitis, those patients willing to participate in the study, those willing to undergo patch test, and those willing to come regularly for follow up were included in the study. Pregnant women, lactating women, children less than 12 years, those have active infection at test site, keloidal tendency, active herpes infection, suffering from any systemic diseases, and patients on any oral treatment for the complaint were excluded from the study. Detail demographic details were obtained from the patients. A detailed history was taken with particular reference to onset, duration and evolution of symptoms, constitutional and systemic disturbances, pre-existing skin disease, predisposing factors, genetic, seasonal factors and details of topical and systemic medications. Detailed examination was carried out in all cases to find out the precise distribution and morphology of lesions and to detect evidence for any preexisting skin disorder or any associated dermatoses. The patch test procedure was explained and written consent was obtained in every case. The patch testing was performed using Indian standard series manufactured by Systopic Laboratory Private Limited New Delhi and approved by Contact and Occupational Dermatitis Forum of India (CODFI).

### Method of application and interpretation of reading

The antigens were placed in aluminium Finn chambers in the prescribed sequence. The back was thoroughly cleaned with spirit and excessive hair was shaved before applying the patch test units. The patients were instructed not to have bath and to refrain from strenuous physical activity which could result into profuse sweating. They were also instructed to not to wear tight underclothes, to avoid friction, rubbing or scratching. The patches were removed after 48 hours and site of contact of allergen was marked with marking pen. Reading was taken at 48 hours and again after 72 hours.

The observations were graded according to the ICDRG recommendation (International Contact Dermatitis Research group) Table 1

**Table 1: Grades of positive patch test reaction**

± or ?	Faint erythema	Doubtful reaction
+	Erythema and papules	Weak positive reaction
++	Erythema; papules and vesicles	Strong positive reaction
+++	Erythema, edema and vesicles/ulceration	Extreme positive reaction
-	No change	Negative reaction
IR	No induration	Irritant reaction



**Fig1: A patient shows allergic contact dermatitis on both the palms**



## RESULTS

A total of 100 patients of allergic contact dermatitis among agricultural workers were patch tested with the Indian Standard Battery. In the present study out of 100 patients, 77 % were male and 23% were female with a male: female ratio of 3.34: 1. The commonest age group among males affected was 51 to 60 years followed by 41 to 50 year age group. In the 71 to 80 year age group there were only 2 cases. The youngest patient was 19 years old and the oldest was 73 years. Majority of females were in the age group of 31 to 40 years followed by 41 to 50 year followed by 51-60 year. Itching was the most common symptom present in 98% of the patients followed by pigmentation of skin (93%), burning sensation at the site (42%), and Pain (29 %).

As the study groups was agricultural workers, the symptoms were mostly aggravated by exposure to parthenium which was seen in 71% of cases, followed by flowers (38%) and other plants (12%) . The most common affecting site was hand seen in 92% cases, followed by foot (55%) case, both hand & feet in 49% cases, and other site like face was seen in only 2% of cases. Out of total 100 patients tested for patch test only 8% showed positivity and all of them to Parthenium hysterophorus in our study.(Fig: 2)





Fig2: A patient shows positive reaction to Parthenium hysterophorus



Table 2: Grades of Positive patch test observed as per ICDRG recommendation

Sr. No.	Patient number in study	Observation after 48 hours	Observations after 72 hours	Grade
01	01	Erythema, papule, vesicle	Erythema, papule, vesicle	++
02	11	Erythema, papule, vesicle	Erythema, papule, vesicle	++
03	13	Erythema, papule, vesicle	Erythema, papule, vesicle	++
04	14	Erythema, papule, vesicle	Erythema, papule, vesicle	++
05	15	Erythema, edema, vesicle	Erythema, edema, vesicle	+++
06	18	Erythema, papule, vesicle	Erythema, papule, vesicle	++
07	88	Erythema, papule, vesicle	Erythema, papule, vesicle	++
08	92	Erythema, papule, vesicle	Erythema, papule, vesicle	++

## DISCUSSION

Allergic contact dermatitis is one of the commonest dermatological disorder in India. The study showed predominance of dermatitis in males (77%) which is in league with results of other studies done concerning allergic contact dermatitis.

**Table 3: Comparison of sex distribution with other studies**

SN	Studies	Male	Female	Ratio (M:F)
1	Kishore NB et al <sup>6</sup> .	28	22	1.21:1
2	Kumar P et al <sup>7</sup> .	92	74	1.2:1
3	Goh CL et al <sup>8</sup> .	404	317	1.27:1
4	Dipgen TL et al <sup>9</sup> .	164	252	1:1.54
5	Bajaj AK et al <sup>10</sup> .	23	34	1:1.5
6	Present study	77	23	3.34:1

Since agricultural work is commonly done by males, we found in our study that they were more in number. Kishore NB et al, Kumar P et al and Goh CL et al showed male preponderance as happened in our study. Dipgen TL et al and Bajaj AK et al. showed higher incidence in females of allergic contact dermatitis in general population.

**Table 4: Comparison of symptoms with other studies**

symptoms	Kishore NB et al <sup>6</sup> .	Present study
Itching	76%	98%
Pain	40%	29%

These variations are probably due to the geographical area and type of work done by our patients comparing to the other studies.

Our study showed positivity to patch test in 8% of patients to parthenium which is lower than Bajaj et al (14.6%) and Handa et al (23.5%) which was done in general population.

Thus, it may be possible that positivity to parthenium is decreasing or may be that the rural agricultural workers may have developed tolerance to this common agricultural antigen leading to decreased sensitivity.

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