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A STUDY OF EPIDEMIOLOGY & CLINICAL PATTERNS OF PARTHENIUM INDUCED DERMATITIS IN AGRICULTURAL LABOURERS IN AND AROUND KAKINADA

Dermatology

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ABSTRACT

Background: Parthenium hysterophorus is a member of compositae family which is an important cause of allergic contact dermatitis due to plants. Parthenium dermatitis is a major problem in India.It causes a spectrum of clinical patterns. Parthenium dermatitis in its classic form known as Air Borne Contact Dermatitis, primarily affects the exposed areas and the flexures . Other patterns are seborheic dermatitis, wide spread dermatitis and exfoliative dermatitisetc.

Aims : This study was conducted to know epidemiology, and clinical patterns of Parthenium induced dermatitis in agricultural labourers residing in and around Kakinada in Andhra Pradesh who are constantly exposed to plants and weeds in their day today activities.

Methods: A total of 75 patients i.e 60 males and 15 females with suspected phytodermatitis were subjected to complete clinical examination and clinicoepidemiological features were noted down. Routine haematological and urinary investigations were done to rule out systemic diseases.later, patch testing was done using finn chambers and parthenium antigens supplied by systopic Labs, New Delhi.Parthenium dermatitis is a major menace in agricultural labourers . Effective measures should be taken to evade this menace and to protect them. Hence, an attempt has been made to identify the role of Parthenium as a cause of phytodermatitis among agricultural labourers in this area.

KEYWORDS

parthenium hysterophorus, agricultural labourers, contact allergic dermatitis.

INTRODUCTION:

Contact dermatitis is an inflammatory response of skin to an exogenous substance which may be irritant or allergen.[1,2,3]

Contact dermatitis is divided into major types, contact irritant dermatitis (CID) and contact allergic dermatitis (CAD) both of which include contact urticaria and photo contact dermatitis.[4] Contact allergic dermatitis(CAD) is due to delayed cell mediated allergic reaction to allergens that directly come in contact with the skin. Dermatitis caused due to plants is called phytodermatitis. The plants causing phytodermatitis are of composite family of which Parthenium hysterophorus (51%), Chrysanthemum morifolium (23%), Dahlia pinnata (9%), Tagetus indica(4%) are the most common. Parthenium hysterophorus produces various patterns of dermatitis like airborne contact dermatitis, atopic dermatitis, photodermatitis, seborrheic dermatitis and even exfoliative dermatitis.[5]

Air borne contact dermatitis is a kind of dry, lichenified dermatosis caused by pollen and dried leaves spread by wind. Contact dermatitis due to air borne antigens is generally diffuse involving upper eyelids, "v" of the chest, cubital fossa and popliteal fossa.[6]Itcan also result in a pattern which mimics photosensitivity. Such patients may develop a true photosensitivity dermatitis (chronic actinic dermatitis / actinic reticuloid).[7] Chronic actinic dermatitis pattern manifests as lichenified papules and plaques localized to exposed areas such as forehead,rims of the ears, cheeks , "v " of chest, nape of neck, the dorsa of forearms, and the hands[8]. Mixed pattern manifests as scattered infiltrated scaly papules over exposed as well as dermatitis over eyelids & flexures. Exfoliative dermatitis presents with universal involvement of skin in the form of erythema, scaling and induration[9]. Prurigo nodularis like eruption pattern manifests as multiple ,pruritic hyperkeratotic papules and nodules over extremities with characteristic histopathological features similar to prurigo nodularis. In photosensitive lichenoid eruption pattern ,the lesions are pruritic, discrete, flat & violaceous with sparing of upper eyelids ,retro auricular areas and under surface of chin. Histopathology show features of chronic nonspecific dermatitis[10].other patterns are widespread dermatitis of non airborne contact dermatitis [11],seborrheic pattern, dermatitis of hands and feet,perianal dermatitis and vesicular hand eczema[12].Patch testing is the diagnostic tool for allergic dermatitis. Properly applied and correctly interpreted patch tests provides an accurate and relatively simple means of diagnosis and allows the physician to initiate appropriate management.

Though, East Godavari district of Andhra Pradesh being mainly a district with agriculture as the principal occupation, the incidence and extent to which Parthenium is a causative factor of dermatitis is still not known. Hence, an attempt has been made to identify the role of Parthenium as a cause of phytodermatitis among agricultural labourers in this area.

METHOD:

All agricultural labourers of either sex with eczemas, attending outpatient department of Dermatology, venereology & leprosy, at Government General Hospital attached to Rangaraya medical college, Kakinada were identified and they constituted the primary clinical material for this study. All such patients were further screened for history and clinical features suggestive of phytodermatitis. A total of 75 such patients were selected who formed final clinical material for the present study.

Procedure of patch test: The patch test units i.e. Finn chamber strips were stuck on the upper back of the patient in the paravertebral position. Excessive hair if present was shaved off prior to sticking the Finn chamber. Care was taken to avoid folds on the strip. Plaster strips were applied if chambers did not adhere well and the patients were advised not to undertake any strenuous exercise and also avoid washing of back.The patients were advised to report after 48 hours (D2) to read the result. Chambers were opened. A waiting period of 30 minutes is allowed to avoid false positive reactions and then the first reading is taken The patient is then asked to come again after 24 hours (D3) and a second reading of the patch test was recorded i.e. at the end of 72 hours to confirm the presence of allergic reaction that will persist or increase and irritant reaction shall tend to decrease. The test results were graded according to the criteria laid down by International Contact Dermatitis Research Group (I.C.D.R.G) as follows:

(-)	Negative reaction
(?)	Doubtful (erythema only)
(+)	Weak (erythema, infiltration, papules)
(++)	Strong (edematous or vesicular)
(+++)	Extreme (ulcerative or bullous)
IR	Irritant reaction
NT	Not tested

The test results were recorded, analyzed and interpreted.

RESULTS:

Table 1: Incidence of parthenium dermatitis:

No. of agricultural labourers attending DVL opd	No. of agricultural labourers with eczemas	No. of agricultural labourers with features suggestive of phytodermatitis	Patch test positive cases (Confirmed cases)	
			No.	%
5400	580	75	32	42.66%

In this study, incidence of parthenium dermatitis among agricultural labourers having features suggestive of phytodermatitis is 32 out of 75 cases i.e. 42.66%.

Table 2: Distribution of cases according to sex and age

Age group	Male		Female		Total number of patients
	No.	Percentage	No.	Percentage	
11-20 yrs	-	-	-	-	-
21-30yrs	1	4.16%	-	-	1
31-40yrs	2	8.34%	4	50%	6
41-50yrs	6	25%	3	37.5%	9
51-60yrs	13	54.17%	1	12.5%	14
61-70yrs	1	4.16%	-	-	1
71-80 yrs	1	4.16%	-	-	1
Total	24	100%	8	100%	32

The maximum number of patients are in the age group of 31-60 yrs i.e 29 out of 32 (90.6%).

Male to female ratio is 3:1.

Table 3: Duration of complaints:

Duration	No. of patients	Percentage
< 6months	8	25%
>6-12 months	1	3.12%
>1-2 years	2	6.25%
>2-5 years	9	28.12%
>5-10 years	10	31.25%
>10 years	2	6.25%
Total	32	100%

25% patients had duration of disease for less than 6 months, 28.12% had disease for 2-5 years and 31.25% had disease for 5-10 years.

7 (21.82%) patients also gave personal history suggestive of atopy.

Table 4: Clinical patterns

Clinical pattern	No.	Percentage
Airborne contact dermatitis (ABCD)	19	59.37%
Dermatitis of hands	3	9.37%
Exfoliative dermatitis pattern	3	9.37%
Wide spread dermatitis	2	6.25%
Mixed pattern	2	6.25%
Seborrheic pattern	2	6.25%
Photosensitive lichenoid pattern	1	3.12%
Total	32	100%

The commonest clinical pattern was ABCD (figure 3) i.e 19 out of 32(59.37%), followed by dermatitis of hand and exfoliative dermatitis(figure 4) pattern o 3 each(9.37%), mixed pattern, wide spread dermatitis and seborrheic dermatitis pattern of 2 each (6.25%) and photosensitive lichenoid eruption (figure5) in 1(3.12%) patient.

DISCUSSION :

Parthenium dermatitis is known to present with varied clinical features and the diagnosis and causative agent is usually established only after an elobarate history, clinical examination of the patient and finally patch testing.

In the present study, the incidence of parthenium dermatitis among agricultural labourers in and around Kakinada (south India) is 42.66%. This is consistent with V.K.Sharma study[13] of 2001 where in ,Parthenium hysterophorus was the commonest cause of plant dermatitis in India and was responsible for 40% of patients attending contact dermatitis clinics.

But a similar study in Chandigarh conducted by V.K.Sharma and Surinder Kaur revealed an incidence of 60.87% which included 20.7% of farmers and the rest were urban people[14].

Though the areas mentioned above are known for agricultural occupation primarily, higher incidence of parthenium dermatitis in Kakinada (South India) could be due to higher sensitization among farmers indirectly reflecting constant exposure or higher concentration of dry plant dust in the surrounding environment.The admixture of industrialization of Chandigarh (North India) could have resulted in lower sensitization of farmers. Majority of parthenium dermatitis patients (90.62%) belonging to 31-60 years age group of this study is in agreement with other similar studies by V.K.Sharma and Surinder Kaur [14](74%) in similar age group and M.D'Souza and K.K.Agarwal[10] (56%) study in 41-60 age group.

Probably this was the age group in which opportunities to come in contact with parthenium are maximum and to develop Parthenium sensitization in the later years.

Male preponderance (3:1) found in this study is similar to other studies conducted by V.K.Sharma and Surinder kaur[14] (3:1) and V.K.Sharma, Sethuraman.G and Bhat.R (2:1)[8].

This may be because men take up more field work than women where they come in contact with various plants, greater out door exposure and also because they work with scanty dressing i.e. shorts whereas females are better claded than men. Gender discrimination is also a possibility because men have more freedom to approach hospital.

Regarding duration of the disease, a sizeable number of patients i.e. 25% sought treatment with in six months, but another sizeable group i.e. 31.25% waited for five to ten years.

Such a large variation in reporting of patients to hospital can be explained on attitude of patients towards disease, their poverty, ignorance, false beliefs and self-medications. In addition, these patients are poor agricultural laborers who are unable to change their occupation or their place of living, because of financial constraints. The duration of disease continues for years together with remissions and exacerbations and also perpetuation of Parthenium dermatitis may occur through continuous exposure to contaminated clothing.

The summer exacerbations found in this study (84.37%) is similar to that of a study by K.K.Agarwal and M.D'Souza[15] (74.5%), V.K.Sharma and Surinder Kaur[14] (55.35%).It is due to dry fragments and pollens of the plant becoming airborne and then coming in contact with exposed skin surfaces and also summer being a growing season of Parthenium hysterophorus plant.

As time passes, with repeated exposure and seasonal exacerbations, the disease results and settles in widespread, extensive, chronic lichenified dermatitis that may persist throughout the year.

In this study, 21.82% showed allergic rhinitis along with dermatitis. A study conducted by K.K.Agarwal and M.D'Souza [15]yielded similar result i.e. 22% had allergic rhinitis and asthma put together. At the same time, study by C.R.Srinivas and Chembolli Laxmi [16]showed 64.28% positivity to atopy. Srirama Rao etal[17]study has incriminated pollen of Parthenium hysterophorus as directly responsible for allergic rhinitis in 42.5%of patients. Thus, it is to be understood that parthenium dermatitis can be either associated with atopy or could present as allergic rhinitis . The ultimate thing is that Parthenium sensitivity itself can present as atopic dermatitis variety. On the other hand, preexisting atopy can easily initiate or perpetuate parthenium dermatitis.

Comparative study of clinical patterns in various studies:

Study	ABCD pattern	Mixed pattern	Dermatitis of hands	Exfoliative dermatitis	Wide spread derma titis	Seborheic derma titis	Photosensitive lichenoid dermatitis pattern
Our study	59.37%	6.25%	9.37%	9.37%	6.25%	6.25%	3.12%
K.K. Agarwal &M.D' Souza study	46%	30%	-	14%		-	-
Tiwari et al study	48%	-	-	-	-	10%	-
S.D. Shenoi et al study	70%	16.67%	-	-	-	-	-

In this study, the commonest clinical pattern is ABCD pattern .Similar results were seen in studies conducted by K.K.Agarwal and M.D'Souza [15] in Pondicherry, V.D.Tiwari, A.S.Sohi and T.R.Chopra [18] in Agra / N.Delhi, S.D.Shenoi and C.R.Srinivas[19] in Manipal. Thus ABCD is the most common pattern of presentation in all studies conducted in South as well as North India.

The next common presentation was of mixed dermatitis pattern in the studies of K.K.Agarwal and M.D'Souza[15] (30%), S.D.Shenoi and C. R. Srinivas [19](16.67%) but in our study it is seen in only 6.25%.

The other patterns presented were exfoliative dermatitis in this study and in K.K.Agarwal study[15]. Seborrheic pattern was seen both in this study and study by Tiwari etal[18]. The present study identified three more patterns of parthenium dermatitis which are not described in other studies quoted above. They are wide spread dermatitis, dermatitis of hands and photosensitive lichenoid dermatitis pattern. Photosensitive lichenoid dermatitis, a term coined by Kaushal K.Verma etal[10] in 2002.

As the disease progresses, patients with an initial airborne contact dermatitis subsequently develop localization to the exposed parts that resembles chronic actinic dermatitis or mixed pattern[8,20].

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