FREQUENCY OF SENSITIVITY TO LEAVES, FLOWERS AND STEM OF PARTHENIUM HYSTEROPHORUS IN PATIENTS WITH CHRONIC ECZEMA

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ABSTRACT

Background: Eczema or contact dermatitis can be endogenous or exogenous and both these are pruritic in nature. Many allergens including plants can cause exogenous eczema.

Patients and methods: Fifty patients presenting with extensive eczematous eruption were enrolled in this quasi experimental study. They were patch tested with fresh crushed extract of flowers, stem and leaves of *Parthenium hysterophorus*. Patch test readings were recorded at 48 hours, 72 hours and 120 hours.

Results: There were more male (88 %) patients as compared to female (12%) with male to female ratio of 7.3:1. Average age of the patients was 56.8 years with S.D ±12.6 years. Similar number of enrolled patients showed (54%) showed positive patch test reactions to fresh crushed extract of flowers, leaves and stem of *Parthenium hysterophorus.*

Conclusion: Flowers, leaves and stem of *Parthenium hysterophorus* have similar allergenic potential in susceptible individuals

Key words: Parthenium hysterophorus, eczematous eruption, patch test..

INTRODUCTION

Eczema is a pruritic inflammatory skin disorders.[1] It can be endogenous in nature or caused by exogenous agents. Exogenous eczema (contact dermatitis) accounts for 4 to 7% of dermatological consultations.[1] The two subtypes of contact dermatitis are allergic and irritant contact dermatitis. Allergic contact dermatitis results from delayed hypersensitivity reaction/cell mediated immunity.[2]

In Pakistan, some patients suffer from recurrent or persistent eczematous eruption. Their eczematous eruption responds to treatment but there is an invariable relapse of dermatitis after sometime. In India, Parthenium hysterophorus causes this type of eczema. Therefore, this present study was designed to see if P. hysterophorus is responsible for eczematous eruption in our patients, as well. Secondly we wanted to elucidate whether only flowers are responsible for this eruption or it is caused by leaves and stem equally or to some extent.

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Parthenium hysterophorus belongs to Compositae family of plants and is responsible for causing allergic contact dermatitis.[3] It is spreading in various countries like USA, China, Australia, India including Pakistan. In our country it is used as filler in bouquets. It has various contact sensitizers like parthenolide, parthenin, ambroisin, cronopillin and embroysin. These are oil soluble oleoresins and are thought to be present throughout the plant.[4]Various solvents can be used to extract these allergens for testing on susceptible patients.[4]

PATIENTS AND METHODS

This study was conducted at Department of Dermatology, Jinnah Hospital/Allama Iqbal Medical College, Lahore. Ethical approval was taken from hospital ethical committee. It was a quasi experimental study. Non-probability convenient sampling technique was used for this study.

Adult patients of either sex having chronic persistent/recurrent nonspecific eczematous eruption were enrolled for this study. Patients having active eczematous skin eruption or those who had taken oral steroids >15mg or immune modulator drugs during previous six weeks, or denuded areas on the back, suffering from chronic diseases like diabetes mellitus, chronic renal failure, chronic liver disease, systemic lupus erythematosus, sarcoidosis, tuberculosis and AIDS were excluded from this study. Pregnant patients were also excluded from this study.

Fifty consecutive patients fulfilling inclusion criteria were enrolled for the study. Informed consent was taken from enrolled patients. History of occupation,

daily routine activities, leisure activities, hobbies, other allergies was also taken. Family history of similar illness and allergies was also recorded.

Fresh crushed extracts of flowers, leaves and stem of Parthenium hysterophorus were used for patch testing. Yellow soft paraffin was used as control. Commercially available IQ chambers were used for patch testing. First reading was taken, half an hour after removal of patches, at 48 hours after application of patches. Further two readings were recorded at 24 hrs and 72 hrs after removal of patches. Patch test results were declared as positive or negative on the basis of third reading that was recorded at 120 hours after application of patches. Patch test readings were interpreted according to International Contact Dermatitis Research Group (ICDRG) criteria.[5]

Data was analyzed with the help of SPSS version 10. A p value ≤ 0.05 was taken as significant where applicable.

RESULTS

All, 50, enrolled patients completed the study. Forty-four (88%) of our enrolled patients were males, while six (12%) patients were females. The male to female ratio was 7.3:1. The age of patients ranged from 44 to 88 years. Majority of our patients were in fifth or sixth decades of life (Figure 1). Average age of the patients was 56.8 years with S.D ± 12.6 years. Among enrolled patients no one gave history of atopy.

Twenty seven (54%) patients showed positive patch test reactions to fresh crushed extract of flowers, leaves and stem of Parthenium hysterophorus. Out of these, 23 patients were male while 4 were female with a male to female ratio of 5.7:1. Severity of patch test reactions increased from 1st reading taken at 48 hours to final reading taken at 120 hours. The number of patients showing extreme positive patch test reaction increased from 48 hours reading (1st reading) to final reading at 120 hours ((Figure 2-4).

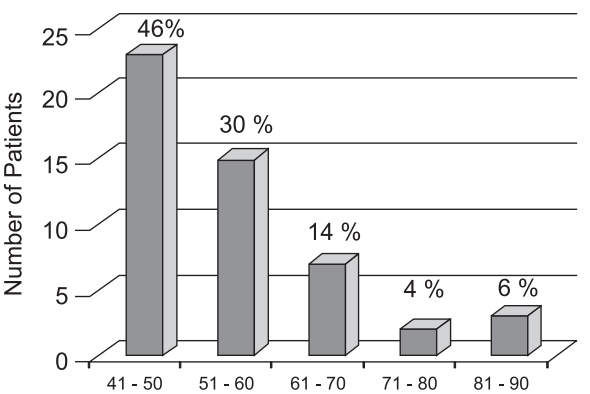

Fig 1: Age of patients in years

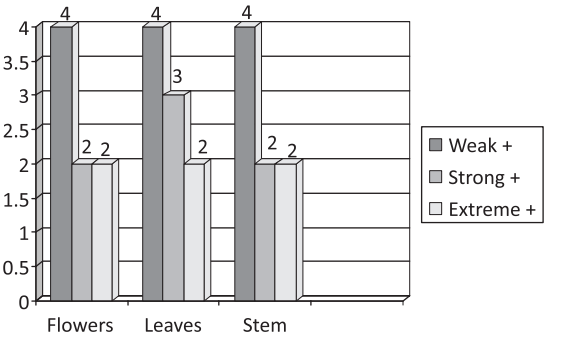

Fig 2: Patch test results at 48 hours with fresh crushed extracts of flowers, leaves and stem of Parthenium Hysterophorus

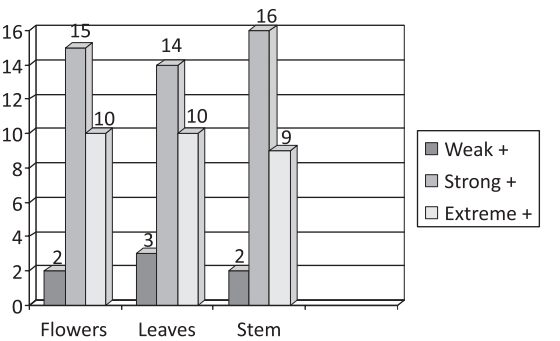

Fig 3: Patch test results at 72 hours with fresh crushed extracts of flowers, leaves and stem of Parthenium Hysterophorus

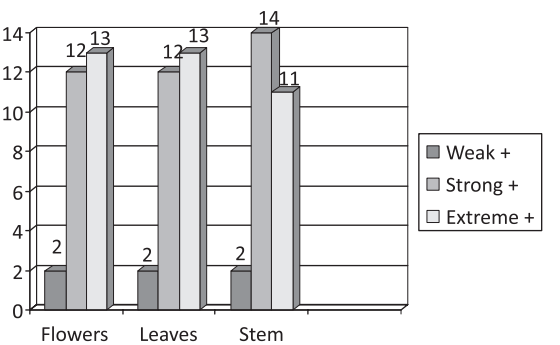

Fig 4: Patch test results at 120 hours with fresh crushed extracts of flowers, leaves and stem of Parthenium Hysterophorus

DISCUSSION

Parthenium hysterophorus is a member of compositae group of plants. [6] It causes allergic contact dermatitis in sensitized individuals.[6] As already mentioned, many countries of the world have reported its allergenic potential. It can cause both localized and disseminated allergic contact dermatitis.

In our study, more than half of enrolled patients showed positive patch test reactions to fresh crushed extract of flowers, stem and leaves of Parthenium

hysterophorus. More number of male patients showed positive patch test reactions as compared to females with a male to female ratio of 5.7:1. This finding is in contrast to international literature that reported male to female ratio of 0.7:1.[7] In another Indian study male to female ratio was reported as 1.3:1. The reason for this sexual disparity in positive patch test reactions between our study and the two referred studies could be dual. First, number of male patients in our study was more as compared to female patients. Second, our male population is mostly responsible for earning livelihood for their families. Hence, the chances of exposure, sensitization and thus eczematous eruption are more in our male population as compared to females.

Three fourth of our enrolled patients were in the 5th and 6th decades of their lives. The reason for this is again the above one. Adults are mostly responsible for earning livelihood. Therefore they get sensitized to this plant and elicit eczematization in later life.

Positive patch test reactions to flowers, leaves and stem of Parthenium hysterophorus were seen in 54% of our patients. All three parts of the plant showed comparable positive patch test reactions because all parts of the plant have similar allergenic potential.[5] An Indian study reported positive patch test reactions with Parthenium hysterophorus in 14.5% of their patients.[8] The reason for comparatively lower percentage of positive patch test reaction with Parthenium hysterophorus in this referred study could be that less than half of the clinically suggestive patients of Parthenium dermatitis were patch tested with Parthenium hysterophorus due to fear of very strong positive reactions. However we performed patch test on all our enrolled patients with fresh extract of flowers, leaves and stem of Parthenium hysterophorus. Therefore, all enrolled patients who were sensitive to Parthenium hysterophorus showed positive patch test reactions with the fresh crushed extract of Parthenium. Thirteen out of our 27 Parthenium sensitive patients showed extreme positive patch test reactions on third reading at 120 hrs. However, these patients were treated successfully with topical steroid creams. A local study conducted by Nadeem et al. in Lahore, Pakistan, showed 76.5% positive patch test results with P. hysterophorus. [9] This study was conducted in a free medical camp on patients from a rural community. However we enrolled patients from all over Punjab province. The reason for positive patch test reactions in high percentage of patients could be that the enrolled patients might be living in similar environmental conditions. Therefore they have similar chances of exposure to Parthenium hysterophorus.

CONCLUSION

Flowers, leaves and stem of Parthenium hysterophorus have comparable allergenic potential.

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