

Frequency of sensitivity to *Parthenium hysterophorus* in patients with chronic extensive eczematous eruption

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Abstract *Background* Eczema is a pruritic skin disorder of exogenous or endogenous nature. Allergic contact dermatitis is of exogenous nature and can be caused by many allergens including plants.

Patients and methods In this quasi-experimental study, 50 patients presenting with extensive eczematous eruption were enrolled. They were patch tested with fresh crushed extract of flowers of *Parthenium hysterophorus*. Three patch test readings were taken at 48 hours, 72 hours and 120 hours. Patch test readings were read according to ICDRG criteria.

Results Forty four (88 %) out of 50 enrolled patients were male while 6 (12%) were female with male to female ratio of 7.3:1. Average age of the patients was 56.8 years with S.D \pm 12.6 years. Fifty four percent of enrolled patients showed positive patch test reactions to fresh crushed extract of flowers of *P. hysterophorus* with a male to female ratio of 5.7:1.

Conclusion *P. hysterophorus* is a leading cause of extensive eczematous eruption of exogenous type in a specific group of patients

Key words

Parthenium hysterophorus, eczematous eruption, patch testing.

Introduction

Eczema is a group of pruritic inflammatory skin disorders resulting from a distinctive reaction of the skin to a range of endogenous and exogenous agents. The most common clinical outcome of exposure to exogenous agents is contact dermatitis that accounts for 4% to 7% of all dermatological consultations.¹ Contact dermatitis can be allergic or irritant in nature.

Allergic contact dermatitis is a type of eczema resulting from delayed hypersensitivity reaction/cell mediated immunity,² which can be localized or generalized.

In Pakistan, a group of patients, generally above 40 years of age suffer from recurrent or persistent eczematous eruption. They respond to treatment but there is an almost invariable recurrence of dermatitis whenever they go back to their own environment. In our neighboring country, India, *Parthenium hysterophorus* is responsible for this type of eczematous eruption. Therefore, this present study was designed to see if *P. hysterophorus* is responsible for eczematous eruption in our patients, as well.

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P. hysterothorus is a member of the Compositae group of plants causing allergic contact dermatitis.³ It is spreading in USA, China, Australia, India as well as urban and rural areas of Pakistan. In Pakistan, it is used in bouquets as filler. The contact sensitizer, parthenolide, is an oil soluble oleoresin present throughout the plant and pollens.⁴ Up to one-third of the oil soluble fraction can be removed with water alone. Parthenolide makes up 0.3% to 1% of the plant weight and is found in other compositae species.⁴ An allergenic sesquiterpene lactone, parthenine, has also been detected in *Parthenium* pollen apart from various other allergens like embroyisin, cronopillin etc.⁴

Patients and methods

This quasi-experimental study was conducted at Department of Dermatology, Jinnah Hospital/Allama Iqbal Medical College, Lahore. Non-probability convenient sampling technique was used for this study.

Patients of either sex, more than 40 years of age, having chronic persistent/recurrent nonspecific eczematous eruption localized to more than one regions of the body, atopic dermatitis like presentation and airborne contact dermatitis were enrolled for this study. Patients who had taken oral steroids >15mg or immunomodulator drugs during previous six weeks, having active eczematous skin eruption or denuded areas on the back, were suffering from chronic diseases like diabetes mellitus, systemic lupus erythematosus, chronic renal failure, chronic liver disease, sarcoidosis, tuberculosis and AIDS were excluded from this study. Similarly, pregnant patients were also excluded from the study.

A total of 50 consecutive patients fulfilling inclusion criteria were enrolled for the study.

Informed consent was taken from patients. Detailed history regarding occupation, daily routine activities, leisure activities, hobbies, other allergies was taken. Family history of similar illness and allergies was also recorded.

Fresh crushed extract of flowers of *P. hysterothorus* was used for patch testing. Yellow soft paraffin was used as control. Standard 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. Two other readings were noted 72 hours and 120 hours after application of patches (24 hrs and 72 hrs after removal of patches). Patch test results were declared as positive or negative on the basis of final reading that was recorded at 120 hours after application of patches. All three 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.

Results

The study was conducted on 50 patients. All 50 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. Vast majority of our patients belonged to fifth or sixth decades of life (**Figure 1**). Average age of the patients was 56.8 years with S.D ± 12.6 years. None of the patients gave history of atopy.

Twenty seven (54%) patients showed positive patch test reactions with fresh crushed extract of flowers of *P. hysterothorus*. Out of these 23

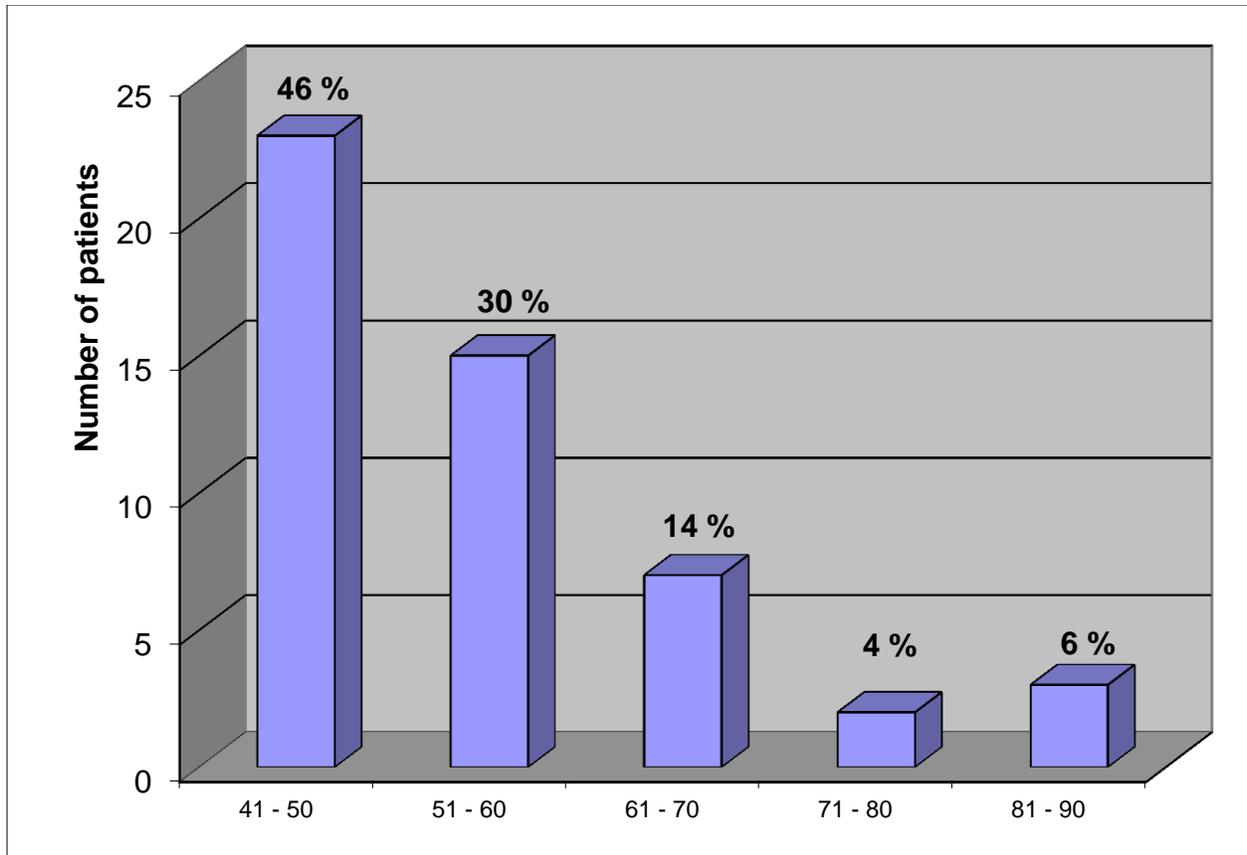


Figure 1 Age distribution of patients (years).

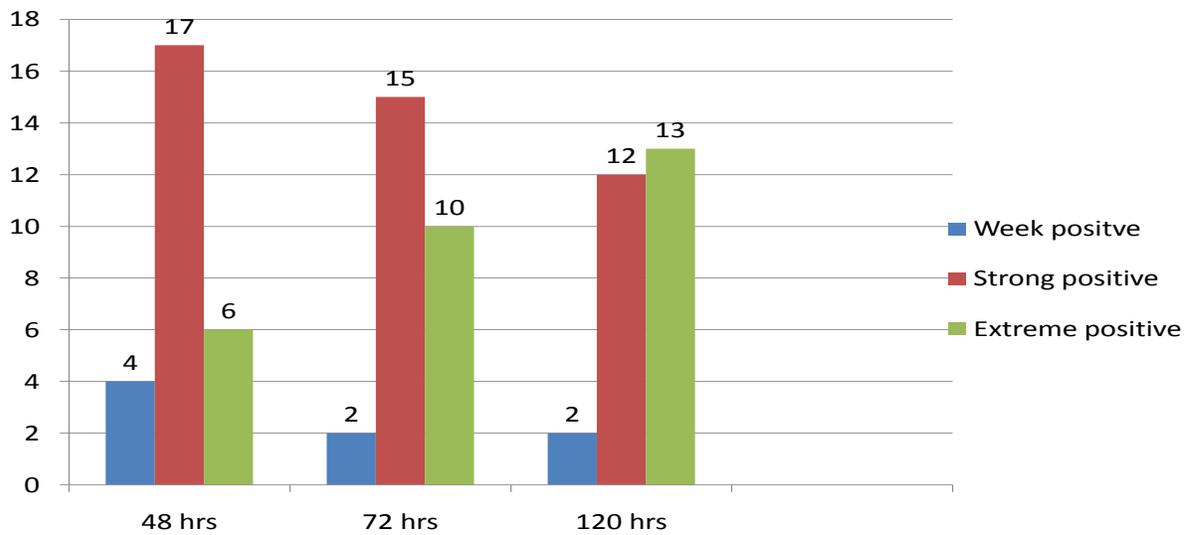


Figure 2 Number of patients showing various grades of severity of positive patch test reactions at 48 hrs, 72 hrs and 120 hrs.

patients were males while 4 were females 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. Six patients showed extreme positive patch test reactions at 48 hours. At 120 hours the number of patients showing extreme positive patch test reactions increased to 13. Number of patients showing various grades of severity of positive patch test reactions at 48 hours, 72 hours and 120 hours are shown in **Figure 2**.

Discussion

P. hysterothorus is a member of compositae group of plants causing allergic contact dermatitis.⁶ Its allergenic potential has been reported from many countries of the world as already mentioned. It can cause localized as well as disseminated allergic contact dermatitis.

In this study, more than half of enrolled patients showed positive patch test reactions to fresh crushed extract of flowers of *P. hysterothorus*. A higher number of male patients had positive patch test reactions as compared to females with a male to female ratio of 5.7:1. This finding is in contrast to the observation of Sudhashree and his colleagues from Bangalore, India, who reported male to female ratio of 0.7:1.⁷ Bajaj *et al.*⁸ from Allahabad, India, observed male to female ratio of 1.3:1. The reason for this disparity of positive patch test reactions between sexes in our study compared to the two referred studies could be because of two reasons. First, number of female patients in the present study was less as compared to male patients. Second, our male population is mostly responsible for earning bread and butter for their families. Therefore, the chances of exposure, sensitization and subsequent 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. Our study design is the reason for 75% of our patients being in this age group, because we enrolled only those patients who were more than 40 years old.

Positive patch test reactions with *Parthenium* were seen in 54% of our patients. Bajaj and his colleagues from Allahabad, India, in their retrospective study reported positive patch test reactions with *P. hysterothorus* in 14.5% of their patients.⁸ The reason for comparatively lower percentage of positive patch test reaction with *P. hysterothorus* in this referred study could be that less than half of the clinically suggestive patients of *Parthenium* dermatitis were patch tested with *P. hysterothorus* due to fear of very strong positive reactions. On the contrary, we patch tested all our enrolled patients with fresh extract of flowers of *P. hysterothorus*. Therefore, all our patients who were sensitive to *P. hysterothorus* showed positive patch test reactions with 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.*⁹ in Lahore, Pakistan, showed 76.5% positive patch test results with *P. hysterothorus*. This study was conducted in a free medical camp on patients from a close rural community. On the other hand we enrolled patients from all over Punjab province. The reason for this high percentage of patients showing positive patch test reactions in the two studies could be because most of our patients might belong to the same area of Punjab where the referred study was conducted. The other reason could be the fact that patients enrolled in the two studies might be living in

similar environmental conditions with almost similar chances of exposure to *P. hysterothorus*.

Conclusion

P. hysterothorus is the leading cause of extensive eczematous eruption in patients who are more than 40 years of age.

Recommendations

The study population should include patients of all ages to see if *P. hysterothorus* is responsible for extensive eczematous eruption in patients from other age groups as well.

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