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Research Article

**STUDY TO DETERMINE THE PARTHENIUM  
HYSTEROPHORUS SENSITIVITY AND ITS FREQUENCY  
AMONG PATIENTS WITH CHRONIC EXTENSIVE  
ECZEMATOUS ERUPTION****Dr. Syed Bilal Ahmed\*, Dr. Zafarullah\*, Dr. Sajida Jabeen\*, Dr. Kaleemullah Kakar\***

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**Abstract:**

*Eczema is an itchy skin disease of endogenous or exogenous in nature. Allergens are the main cause allergic contact dermatitis including plants that is exogenous in nature.*

**Objective:** *The aim of the study was to conclude the Parthenium hysterophorus sensitivity and its frequency among patients with chronic extensive eczematous eruption.*

**Study Design:** *A quasi-experimental study.*

**Place and Duration:** *In the Dermatology department of Sandeman Provincial Hospital Quetta for Six months duration from January 2019 to June 2019.*

**Methods:** *Fifty patients with extensive eczematous rashes were included in this analysis. Tested with patch with freshly crushed Parthenium hysterophorus flower extract. Three patch test readings were performed at 48 hours, 72 hours and 120 hours. Patch test readings were read according to ICDRG criteria.*

**Results:** *Of the 50 patients enrolled, 40 (88%) were male and 6 (12%) female / male / female ratio was 7.3: 1. 56.8 years was the patients mean age with SD  $\pm$  12.6 years. Fifty-four percent of the patients participated in the patch test showed a positive reaction to fresh P. hysterophorus flower extract with a male / female ratio of 5.7: 1.*

**Conclusion:** *P. hysterophorus is an important cause of exogenous eczematous eruption in a particular group of patients.*

**Keywords:** *Parthenium hysterophorus, eczematous rash, patch test.*

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**INTRODUCTION:**

Eczema is a group of pruritic inflammatory skin diseases resulting from a different skin reaction to various endogenous and exogenous agents<sup>1-3</sup>. The most common clinical outcome of exposure to exogenous agents is contact dermatitis, which accounts for 4% to 8% of total consultations of dermatology<sup>4-5</sup>. Contact dermatitis may be allergic or irritating in nature. Allergic contact dermatitis is a type of eczema resulting from delayed hypersensitivity / cellular immune reaction that can be localized or generalized<sup>6</sup>. In Pakistan, a group of patients, usually over 40 years of age, suffer from recurrent or persistent eczematous rashes<sup>7</sup>. They respond to treatment, but there is a recurrence of dermatitis that does not change almost every time they return to their environment<sup>8</sup>. In neighboring India, *Parthenium hysterophorus* is responsible for such eczema eruptions. Therefore, this study was designed to see whether *P. hysterophorus* is responsible for eczematous rash in our patients. *P. hysterophorus* is a member of the Compositae plant group, which causes allergic contact dermatitis<sup>9</sup>. It is spreading in urban and rural areas of the United States, China, Australia, India and Pakistan. Used as filler in bouquets in Pakistan. The contact sensitizer is parthenolide, an oil-soluble oleoresin found in pollens and throughout the plant<sup>10</sup>. Up to 1/3<sup>rd</sup> of the oil-soluble fraction can be extracted with water only. Parthenolide represents 0.3 to 1% by weight of the plant and is found in other types of compounds. A sesquiterpene lactone that is an allergen, parthenine found in *Parthenium* pollen together from different supplementary allergens like cronopillin and embroysin etc.

**MATERIALS AND METHODS:**

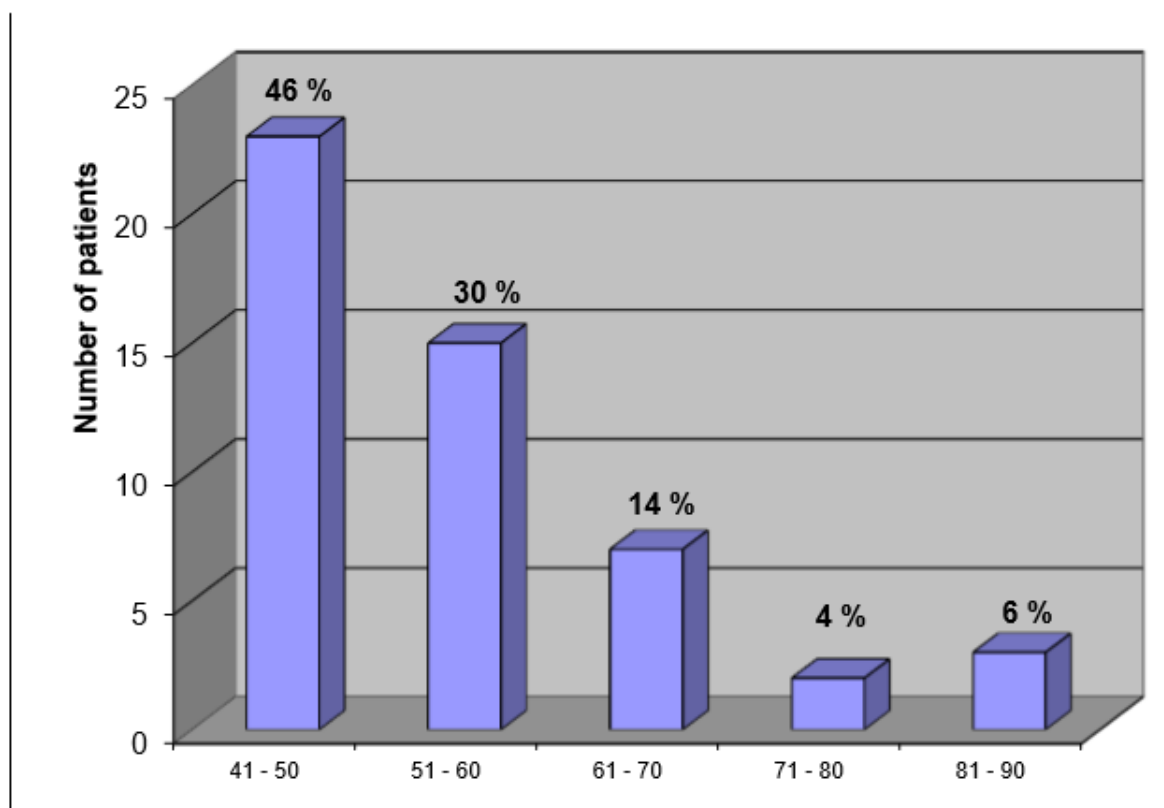
This quasi-experimental study with Non-probability convenient sampling technique was held in the Dermatology department of Services Hospital Lahore for Six months duration from January 2019 to June 2019. Patients of any sex over 40 years with chronic persistent / recurrent nonspecific eczematous rash in more than one body included

atopic dermatitis as presentation and air contact dermatitis for this study. Patients receiving active eczematous skin rash or bare back oral steroids > 15 mg or immunomodulatory drugs for the past six weeks suffered from chronic diseases such as systemic lupus erythematosus, DM, chronic kidney disease and chronic liver disease, AIDS, tuberculosis and sarcoidosis, were not included in this study. Similarly, pregnant patients were excluded from the study. A total of 50 consecutive individuals who meet the criteria of selection were involved in this analysis. From all patients; informed consent was obtained. Detailed information about occupancy, daily routine activities, leisure activities, hobbies and other allergies were obtained. The family had a similar history of illness and allergy was also recorded.

Freshly crushed *P. hysterophorus* flower extract was used for patch testing. Yellow soft paraffin was used as control. For patch testing; Standard IQ chambers were used. The first reading was taken 48 hours after the patch was applied and half an hour after the patches were removed. Two further readings were observed 72 hours and 120 hours after the patch (24 hours and 72 hours after patches removal). The results of the patch test were declared positive or negative based on the last readings recorded 120 hours after the patches were applied. The interpretation of results were compiled according to the criteria International Contact Dermatitis Research Group. Data were analyzed with the help of SPSS 18.0 version. P value was accepted as 0.05.

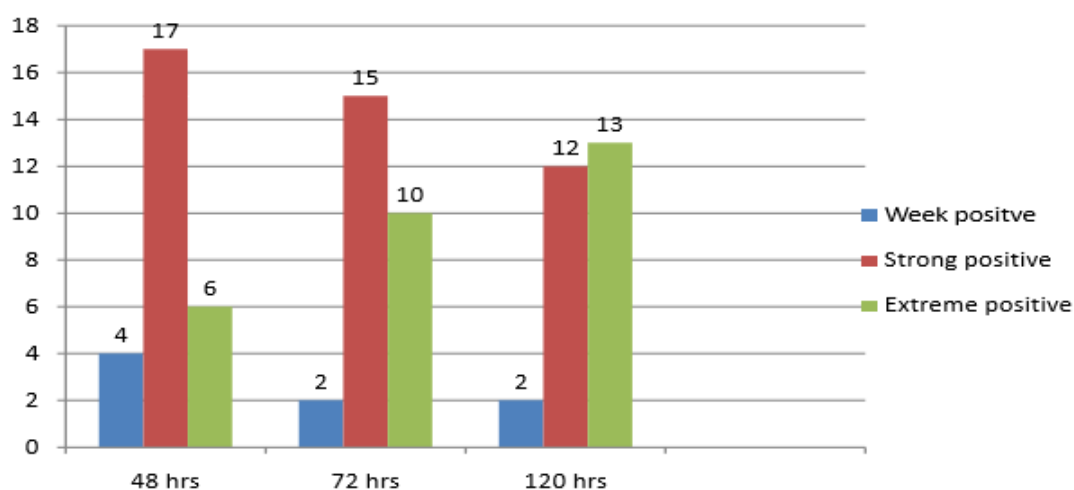
**RESULTS:**

The study was performed in 50 patients. Fifty patients completed the study. Forty-four (88%) patients were male and six (12%) patients were female. 7.3: 1 was the male / female ratio. 44 to 88 years was the patient's age range. The majority of our patients belong to the fifth or sixth decade of life (Figure 1).  $56.8 \pm$  was the patients mean age with  $\pm 12.6$  SD. None of the patients had a history of atopy.



**Figure 1** Age distribution of patients (years).

Twenty-seven (54%) patients showed positive reaction to patch test with freshly crushed *P. hysterophorus* flower extract. These 23 patients were males female were four with 5.7:1 ratio. The severity of the patch test reactions increased from the first reading noted at 48 hours until the last taken at 120 hours. Six patients showed extremely positive patch test reactions at 48 hours. At 120 hours, the number of patients who overreacted to the patch test increased to 13. Figure 2 shows the number of patients showing varying degrees of positive reaction severity to the patch test at 48 hours, 72 hours and 120 hours respectively.



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

### DISCUSSION:

*P. hysterophorus* is a member of a group of plants that cause allergic contact dermatitis. Allergic

potential, as mentioned earlier, has been reported in many countries of the world. Localized and spread contact may cause allergic dermatitis<sup>11</sup>. In this study,

more than half of the registered patients showed a positive reaction to the freshly crushed flower extract of *P.hysterophorus* in the patch test. Male patients had more positive response to patch test with a ratio of 5.7: 1 compared to women. This finding contradicts the observation of Sudhashree and colleagues who reported a relationship in Bangalore, India which show Male / female 0.7: 1.7 ratio. Bajaj et al in India, Allahabad observed the male / female ratio to be 1.3: 1. The reason for this inequality in the positive patch test reactions according to gender in our study may be due to two reasons. First, the number of female patients was lower in this study than in male patients. Second, our male population is primarily responsible for earning bread and butter for their families. Therefore, the chances of exposure, susceptibility, and subsequent eczematous eruption are greater in the male population than in women<sup>12</sup>. Three quarters of our registered patients were in the fifth and sixth decade of life. The design of our study is the reason why 75% of our patients are in this age group because we only hire patients over 40 years of age.

Positive reactions to the patch test with *Parthenium* were observed in 54% of our patients. Bajaj and his colleagues in Allahabad, India, reported positive responses to patch testing with *P. hysterophorus* in 14.5% of patients in retrospective studies<sup>13</sup>. In this study, a relatively low percentage of the positive reaction to the patch test with *P. hysterophorus* may be due to the fact that less than half of the patients clinically suggesting *Parthenium* dermatitis have been tested for *P. hysterophorus*; fear very strong positive reactions<sup>14</sup>. On the contrary, we patched all of our patients with fresh *P. hysterophorus* extract. Therefore, all patients susceptible to *P. hysterophorus* showed a positive reaction with *Parthenium* extract on patch test. Thirteen of our 27 patients who were susceptible to *Parthenium* showed extremely positive patch reactions to the third reading at 120 hours. However, these patients were successfully treated with topical steroid creams. A local study by Nadeem et al. In Lahore, Pakistan showed a 76.5% positive result in a patch test with *P. hysterophorus*. This study was conducted in a free health camp with patients from a nearby rural community. On the other hand, we get sick from all over Punjab<sup>15</sup>. The reason for this high percentage of disease, which showed a positive reaction to patch testing in both studies, may be that most of our patients may belong to the same region in the Punjab region where the study was conducted.

### CONCLUSION:

*P. hysterophorus* is the leading cause of common eczema rashes in patients over 40 years of age.

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