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Original Article

Star weed *(Parthenium hysterophorus)* allergy in Allergic Rhinosinusitis patients as determined by Skin Prick test

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ABSTRACT

Star weed is herbaceous plant growing freely in whole of Indian country side. This plant produces large quantities of white pollen, which many people are allergic to. This study seeks to examine the prevalence of Star weed *(Parthenium hysterophorus)* allergy in a subset of Allergic Rhinosinusitis patients who attend ENT Clinic, as determined by a Skin Prick test.

1. Introduction

Star weed *(Parthenium hysterophorus)* is a ubiquitous weed growing freely in Indian countryside and road side. (10) Many people have become sensitized and allergic to the copious amounts of white pollen regularly produced and aerogenically released by this plant. In addition it also produces a toxin "parthenin" which leads to Contact dermatitis in humans and cattle. (8) The association between the pollen of this plant and Allergic rhinitis has not been studied in India.

2. Materials and Methods

Preparation of "Standardized antigen concentrate"

An aqueous extract of Star weed *(Parthenium hysterophorus)* white pollen was used for performing the skin prick test. This was prepared by mixing 300grams of pollen to 1 liter of distilled water. This solution was then homogenized by gently heating for 10 minutes at 80 degree Celsius. This was the

"Standardized antigen concentrate". (9) This was diluted to 1:20 times weight per volume and used for Skin prick test.

Patient criteria

Patients were selected for the test, by a questionnaire for screening subset of cases who were suffering from Allergic Rhinosinusitis. Clinical evaluation was done in all selected cases.

Age less than 14 years and more than 65 years were excluded from the study. Due to risky nature of the test, following cases were excluded from testing.

1. Patients who took Beta-blockers were totally excluded from study.

2. All hypertensive patients were checked Blood pressure twice to ascertain normalcy, before proceeding to test.

3. Heart disease patients were completely excluded from study.

4. Diabetes and Immuno-suppressed were excluded, due risk from skin prick.

Testing precaution

Emergency resuscitation equipment was kept ready to revive the patient in case of Anaphylactic shock from Skin prick test. Adrenaline, Hydrocortisone, Anti Histamines, Intravenous access devices, and emergency resuscitation equipment. (9)

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1. In order to establish standardization test, female patients' comfort and ease of reading the outcome, this Test was done only on volar surface of forearm; other parts like thigh and upper back were avoided

2. A small drop of Antigen concentrate was placed on the skin. A regular 24 gauge hypodermic needle was used to "tent up" or elevate the skin via the drop of antigen, taking care to avoid bleeding of puncture of the deeper subcutaneous layer or the dermis.

3. Response was checked after 20 minutes.

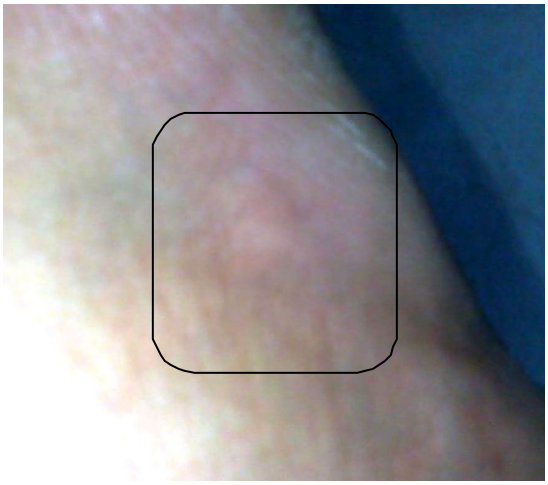
4. Dip method of testing where antigen is picked up on tip of needle, was not used. Glycerination of Antigen concentrate deemed necessary was found to be cumbersome, hence avoided.

5. Tested area was kept immobile for 20 minutes.

6. Negative control was a 10% solution of glycerin.

Fig 1. A flare reaction to Skin prick antigen test- Negative Skin Prick test

Fig 2. A wheal response more than 3mm



Outcome of the test

1. Positive - A wheal response more than 3mm in size, after 20 minutes was considered positive.

2. Negative - No response at the test site. Flare / Congestion was taken as negative

Results

The outcome of the test is tabulated in the following table

Table 1 : Outcomes of the Skin prick test for Parthenium hysterophorus pollen allergy

Operative findings	Allergic Rhino sinusitis	Normal ENT patients	Total
Test positive >3mm wheal	67	51	98
Test negative <3 mm wheal Flare	33	49	102
	100	100	200Chi sq =5.291 >>> 3.841 at P value 5% significance

Statistical check

A chi square test was set up with null hypothesis [H0] that, there is no difference in observed positive response between Allergic Rhinosinusitis patient and normal patient. Chi square test was validated without Yates correction because none of the cell has a value less than 4. The standard chi square test was found to give a value of 5.291.The test has a 1 X 1 degree of freedom; the P value of at 5% (0.05) significance, given in table is 3.841, which is greater than study Chi square value. This difference has not arisen out of a statistical error, and there is a statistically significant association between Allergic Rhinosinusitis and Star weed allergy.

Discussion

Allergic Rhino sinusitis is triggered by a variety of factors in day today use. Most people are allergic to House-mites, animal dander or food colorants. Parthenium hysterophorus is an herbaceous weed growing freely in Indian countryside. It belongs to the family Compositae and a native of tropical zones of America (7).It is commonly known in Hindi as "Gajar Ghas" meaning Carrot grass. Author has personally seen the weed in most of the Indian states. The flowering season of the weed peaks around January – March where copious amounts of pollen are released. Most of the people get exposed to this pollen, become Immuno-sensitized then develop an immune reaction to the proteins in the pollen.

Fig 3 and 4 Parthenium hysterophorus- a herbaceous weed found growing freely in Indian Countryside, Fig 4 : This shows the star shaped white inflorescence which gets its name. shows star shaped flower from which it gets its name – Star weed

Parthenium is a major contributor in the suffering of Allergic Rhinosinusitis patients. Since there is a single airway from nose to alveoli, it is also likely to have a hand in the pathogenesis of Asthma. This remains to be studied. Eradication of the weed may offer some respite in sufferers of Hay fever and Asthma.

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