HOUSE DUST MITES AND POLLENS AS RISK FACTORS IN ALLERGIC MANIFESTATIONS

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ABSTRACT
House dust mites and pollens play a major role in parthenogenesis of allergic disorders particularly asthma and rhinitis. The most commonly found house dust mites are *Dermatophagoides farinae*, *Dermatophagoides pteronyssinus* and *Blomia tropicalis*. *Parthenium hystrophorus*, *Morus alba*, *Ageratum* spp, *Cannabis sativa*, *Pennisetum typhoides*, *Amaranthus*, *Xanthium strumarium*, *Chenopodium album*, *Eucalyptus* spp, *Chenopodium murale*, *Asphodelus* spp, *Imperata cylindrica* and *Brassica compestris* were the major pollens found in North India. During present study, 400 patients with allergic manifestations who visited ENT department of Rajindra hospital, Patiala from 2013 to 2015 were considered. The patients were divided into 7 groups based on clinical findings 1) Allergic rhinitis 2) Asthma 3) Allergic rhinitis and Asthma 4) Dermatitis 5) Allergic rhinitis and Dermatitis 6) Asthma and Dermatitis and 7) Control. Of the 400 patients, skin prick tests were performed on 165 patients falling in these 7 groups. Based on positivity to skin test and sensitivity to the antigens individuals were also categorized into 7 groups. The results of investigations and skin tests have been discussed in this paper. According to our observation maximum number of patients was sensitive to dust mites followed by dust mites and pollens only.

KEYWORDS : Asthma, Allergic rhinitis, House dust mites, Pollens, Dermatitis

The aerobiologists and allergologists have been working for the last many years to find out the allergenic potentials of dust mites, fungal spores and pollens (Agashe and Vinay, 1980; Tilak, 1982; Van-Hage et al., 1987). All these aeroallergens are found in close environment of man and their role vary with the environmental conditions such as climatic factors and degree of exposure (Deschildre, 1999 and Melson and Brinchl, 2001). Indoor levels of allergens play a major role in the development of sensitization and triggering asthmatic attacks in children as worked out by Flaherty et al. (1984), Samson (1985). House dust mites, in particular *Dermatophagoides pteronyssinus* and *D. farinae* have been shown to play an important role in the parthenogenesis of asthma and atopic diseases. (Plattis-Mill and De Weck, 1989; Plattis-Mill, 1992 and Peat et al., 1996). Mite allergen level of $>2\mu g/g$ of dust (100 mites per gram) is considered as risk level for sensitization and symptoms of asthma (Munir 1998 and Dreberg 1998).

Similarly pollens are another risk factor for allergy. Although they are the problems in outdoor allergy but considerable amount of pollens are present in indoor environment. Most airborne tree pollens are shed during spring and early summer, grass pollens during midsummer, weed pollens during late summer and rain fall. When pollens are released in large number they produce allergic problems such as allergic rhinitis and hay fever.

Several epidemiological and diagnostic studies have reported an increasing prevalence of allergic reactivity to these allergens (Semik- Orzech et. al., 2008). However, the exact prevalence of allergic sensitization is not known, mainly due to lack of standardized allergen extracts and due to overwhelming number of allergenic species that are able to elicit IgE mediated reactions. The effective in vivo and in vitro diagnosis of allergies is based on availability of well-characterized allergen preparation (Kurup et. al., 2000). The present study is aimed at determining the prevalence of IgE mediated allergy to dust mites and pollens as well as contribution of sensitization to these aeroallergens with respect to allergic manifestations.

MATERIALS AND METHODS
A retro prospective study was conducted on 400 patients who visited ENT department of Rajindra hospital, Patiala from 2013 to 2015. All patients were subjected to full ENT examination. Patients were selected based on symptoms of sneezing, watery rhinorrhoea, nasal obstruction, eye symptoms (in the form of redness, watering of eyes and itching), itching of nose, throat and ear and any

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The total serum IgE levels were also detected with ImmunoCAP phadia 100 (Thermo Fisher Scientific, USA) of the patients who were positive for one or more allergens. Based on clinical findings and investigations done, patients were categorized into seven groups: 1. Allergic rhinitis 2. Asthma 3. Allergic rhinitis and Asthma 4. Dermatitis 5. Allergic rhinitis and Dermatitis 6. Asthma and Dermatitis 7. Normal as control. Skin prick tests were performed on 165 individuals. Based on positivity to skin tests and sensitivity to antigens individuals were categorized into 4 groups: 1. Positive towards dust mites 2. Positive towards pollens 3. Positive towards pollen and dust mites and 4. Negative to all of them. Patients were excluded from the study if they had clinical features of vasomotor rhinitis, COPD, if they had received treatment of corticosteroid or the other immunosuppressive therapy during preceding 6 months, if they had elevated IgE levels caused by another disease or if they had ever received allergen immunotherapy.

Data Analysis

Data was analyzed statistically by using chi square to see whether the two attributes taken are independent or dependent. It has been calculated at two levels, at 0.05% level it was considered significant and at 0.01% levels was considered highly significant.

Table 1: Descriptive Characteristics of Patients Who Visited the ENT Department

<table>
<thead>
<tr>
<th></th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Individuals</td>
<td>225 (56.25%)</td>
<td>175 (43.8%)</td>
<td>400</td>
</tr>
<tr>
<td>Age of Individuals (Mean ± S.D)</td>
<td>36.5 ± 17.4*</td>
<td>35.4 ± 17.8*</td>
<td>35.9 ± 17.6*</td>
</tr>
</tbody>
</table>

*p<0.01 was considered to be significant

Total Patients on Whom Skin Prick Tests Were Conduct 165 (41.25%)

Positive Results for Skin Prick Tests
160 Patients (96.96%)

Negative Results for Skin Prick Tests

Table 2: Gender and Age of Individuals Selected for Skin Prick Tests

<table>
<thead>
<tr>
<th></th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Individuals</td>
<td>90 (54.54%)</td>
<td>75 (45.45%)</td>
<td>165</td>
</tr>
<tr>
<td>Age of Individuals (Mean ± S.D)</td>
<td>35.3 ± 16.5*</td>
<td>34.5 ± 16.8*</td>
<td>34.9 ± 16.5*</td>
</tr>
</tbody>
</table>

*p<0.01 was considered to be significant
Table 3: Number, Percentage and Age of Individuals Sensitive to Different Allergens

<table>
<thead>
<tr>
<th>Allergens</th>
<th>Number</th>
<th>Percentage</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>62</td>
<td>37.58</td>
<td>34.3 ± 16.5</td>
</tr>
<tr>
<td>DM/P</td>
<td>50</td>
<td>30.30</td>
<td>35.4 ± 16.8</td>
</tr>
<tr>
<td>P</td>
<td>48</td>
<td>29.09</td>
<td>34.4 ± 16.7</td>
</tr>
<tr>
<td>Nill</td>
<td>5</td>
<td>3.03</td>
<td>34.3 ± 16.5</td>
</tr>
</tbody>
</table>

Table 4: Prevalence of Patients to Allergen Sensitivity

<table>
<thead>
<tr>
<th>Allergens Disorders</th>
<th>Sensitive to dust mites No.</th>
<th>Sensitive to dust mites and pollens No.</th>
<th>Sensitive pollens No.</th>
<th>Total No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>3.12</td>
</tr>
<tr>
<td>Asthma</td>
<td>13</td>
<td>11</td>
<td>10</td>
<td>34</td>
<td>21.25</td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>12</td>
<td>10</td>
<td>11</td>
<td>33</td>
<td>20.62</td>
</tr>
<tr>
<td>Allergic rhinitis and asthma</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>23</td>
<td>14.4</td>
</tr>
<tr>
<td>Dermatitis</td>
<td>10</td>
<td>8</td>
<td>7</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>Asthma and Dermatitis</td>
<td>08</td>
<td>7</td>
<td>7</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>50</td>
<td>48</td>
<td>160</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5: Number of Individuals Sensitized to Different Type of Dust Mites

<table>
<thead>
<tr>
<th>Dust mites</th>
<th>Number of Individuals</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. farinae</td>
<td>86</td>
<td>52.12</td>
</tr>
<tr>
<td>D. pteronyssinus</td>
<td>72</td>
<td>43.64</td>
</tr>
<tr>
<td>G. destructor</td>
<td>64</td>
<td>38.79</td>
</tr>
<tr>
<td>T. putrescentiae</td>
<td>62</td>
<td>37.56</td>
</tr>
<tr>
<td>A. siro</td>
<td>57</td>
<td>34.55</td>
</tr>
</tbody>
</table>

RESULTS

Of the 400 subjects selected for the present study 225 were males (56.25%) and 175 were females (43.8%). Skin prick tests were performed only on 165 subjects of these 165 subjects whose history was suggestive of allergy. Of these 160 subjects were found to be sensitized for one or more allergens. History of where 5 subjects did not give any response to the allergens (Table 1) though their history was suggestive of allergy.

Of the 165 subjects 90 (54.54%) were males in the age group of 34.3 ± 16.5 and 75 (45.45%) in the 34.5 ± 16.8 were females (Table 2).

It has been observed that of the 165 positive subjects 62 i.e. 37.58% were sensitive to dust mites only, 50 i.e. 30.30% were sensitive to dust mite and pollens, 48 i.e. 129.09% were sensitive to pollens only, 3.03% did not show sensitivity to any of the allergen. According to our observation maximum number of patients were sensitive to dust mites only followed by dust mites and pollens and pollens only (Table 3).

It has been observed from that patient with asthma and allergic rhinitis showed greater sensitivity than patients with other conditions. Statistically there is no dependence on allergen type and disease (Table 4).

From dust mites, allergens of *Dermatophagoids farinae*, *Dermatophagoids pteronyssinus*, Glycyphagus destructor, Tyrophagus putrescentiae and Acarus siro were selected. It has been observed that 52.12% were sensitized...
**Figure 1: Screening for Contributory Factors**

Primary reason for coming to Allergy & Asthma Specialists:

Check your main symptoms - those that prompted your visit here:

<table>
<thead>
<tr>
<th>Head or Nose</th>
<th>Chest</th>
<th>Skin</th>
<th>Insect Stings</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Sneezing</td>
<td>○ Cough</td>
<td>○ Eczema</td>
<td>○ Hives</td>
</tr>
<tr>
<td>○ Post nasal drainage</td>
<td>○ Shortness of Breath</td>
<td>○ Swelling</td>
<td>○ Shortness of Breath</td>
</tr>
<tr>
<td>○ Nose Blocking</td>
<td>○ Hoarseness</td>
<td>○ Hives</td>
<td>○ Itching</td>
</tr>
<tr>
<td>○ Runny Nose</td>
<td>○ Wheezing</td>
<td>○ Itching</td>
<td>○ Swelling</td>
</tr>
<tr>
<td>○ Sinus Infection</td>
<td>○ Chest Infection</td>
<td>○ Hives</td>
<td>○ Dizziness</td>
</tr>
<tr>
<td>○ Sore Throat</td>
<td>○ Voice Loss</td>
<td>○ Itching</td>
<td>○ Fainting</td>
</tr>
<tr>
<td>○ Ear Blocking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○ Headache</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○ Snoring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○ Nosebleeds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○ Eye Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How many years have you suffered from the chief complaints of:

<table>
<thead>
<tr>
<th>Head or Nose symptoms</th>
<th>Chest symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________</td>
<td>________________</td>
</tr>
</tbody>
</table>

Skin symptoms: ________________  Insect Sting reactions: ________________

Please indicate Pattern of symptoms:

<table>
<thead>
<tr>
<th>Year rounds, no seasonal change</th>
<th>Year rounds, worse seasonally</th>
<th>Seasonally only</th>
</tr>
</thead>
<tbody>
<tr>
<td>________</td>
<td>________</td>
<td>________</td>
</tr>
</tbody>
</table>

If seasonal, list months: _______________________________________________________

Are your symptoms worse at night?  O Yes  O No

Do you note increased symptoms from any of the following?

<table>
<thead>
<tr>
<th>Allergens</th>
<th>Irritants</th>
<th>Ingestants</th>
<th>Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Dead Grass</td>
<td>○ Soap</td>
<td>○ Drugs</td>
<td>○ Cold fronts</td>
</tr>
<tr>
<td>○ Mown Grass</td>
<td>○ Perfumes</td>
<td>○ Alcoholic Beverages</td>
<td>○ Windy Days</td>
</tr>
<tr>
<td>○ Hay</td>
<td>○ Cleaning agents</td>
<td>○ Foods</td>
<td>○ Damp weather</td>
</tr>
<tr>
<td>○ Dead Leaves</td>
<td>○ Detergents</td>
<td></td>
<td>○ Temperature change</td>
</tr>
<tr>
<td>○ House Dust</td>
<td>○ Smoke</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

...to be cont..
Please check the ones that best describe your home:

- House (Age ___)  ○ Apartment  ○ City  ○ Country
- Do you have a basement?  ○ Yes  ○ No
- Type of heating system:  ○ Central  ○ Floor  ○ Electric  ○ Other
- Type of pillow:  ○ Synthetic  ○ Down
- Type of mattress:  ○ Conventional  ○ Waterbed
- Do you have stuffed animals?  ○ Yes  ○ No
- Do you have carpet in your home?  ○ Yes  ○ No
- Are your symptoms worse anywhere in your home?  ○ Yes  ○ No
- Location: ______
- Do you have pets at home?  ○ Yes  ○ No
- What kind: ______
- Are your pets kept:  ○ Inside  ○ Outside
- Are your symptoms worse at your work place/school?  ○ Yes  ○ No
- Have your symptoms been so severe as to cause you to miss work or school?  ○ Yes  ○ No
- If so, how many days? ______
- Has travel affected your symptoms?  ○ Yes  ○ No
- Do you have hobbies that expose you to allergens or irritants?  ○ Yes  ○ No
- If yes, explain briefly: ____________________________________________

List medicines you use for relief of allergy symptoms (including nose drops and sprays):
____________________________________________________________________________________________
____________________________________________________________________________________________

List other drugs you take for any reason. (include all over the counter drugs, creams, suppositories, eyedrops, etc.):
____________________________________________________________________________________________
____________________________________________________________________________________________

Can you take Aspirin?  ○ Yes  ○ No
- Are you allergic to any medications?  ○ Yes  ○ No
- If yes, please list: ____________________________________________
- What type of reaction occurs? ____________________________________________
- Have you ever taken hypo-sensitization shots (allergy shots) before?  ○ Yes  ○ No
- Have you ever had a sinus x-ray?  ○ Yes  ○ No  If yes, when? ______
- Where? _________________________

GILL ET AL.: HOUSE DUST MITES AND POLLENS AS RISK FACTORS IN ALLERGIC...
Have you ever had a chest x-ray?  
- Yes  
- No  
If yes, when?  
Where?

Do you smoke?  
- Yes  
- No  
If yes, how many packs per day?  
How long?

Have you ever smoked?  
- Yes  
- No  
If yes, how many packs per day?  
How long?

Does anyone you live with smoke?  
- Yes  
- No  
If yes, who?

Are you exposed to smoke at work or school?  
- Yes  
- No

Is there a history of any of the following in your family?  
- Asthma  
- Eczema  
- Hives  
- Hay fever  
- Nasal polyps  
If so, which family member?

Have you ever been treated in an emergency room?  
- Yes  
- No  
If yes, how many times?
For what were you treated?

List hospitalization in order of most recent:

<table>
<thead>
<tr>
<th>Cause of Hospitalization</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________________</td>
<td>____</td>
</tr>
<tr>
<td>________________________</td>
<td>____</td>
</tr>
<tr>
<td>________________________</td>
<td>____</td>
</tr>
</tbody>
</table>

Circle any of following that you might have had:

- Stomach ulcer  
- Glaucoma  
- High Blood Pressure  
- Diabetes

Circle any of problems that you might have had with the following:

- Blood  
- Bones  
- Head  
- Nervous system  
- Urinary tract

List any medical problems you have not noted above:

---

**Table 6: Number of Individuals Sensitized to Different Type of Pollens**

<table>
<thead>
<tr>
<th>Pollens</th>
<th>Number of Individuals</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Parthenium hystophorus</em></td>
<td>69</td>
<td>41.82</td>
</tr>
<tr>
<td><em>Morus alba</em></td>
<td>58</td>
<td>35.15</td>
</tr>
<tr>
<td><em>Ageratum sp.</em></td>
<td>57</td>
<td>34.55</td>
</tr>
<tr>
<td><em>Cannabis sativa</em></td>
<td>52</td>
<td>31.52</td>
</tr>
<tr>
<td><em>Pennisetum typhoides</em></td>
<td>52</td>
<td>31.52</td>
</tr>
<tr>
<td><em>Amaranthus spinosus</em></td>
<td>51</td>
<td>30.91</td>
</tr>
<tr>
<td><em>Xanthium strumarium</em></td>
<td>51</td>
<td>30.91</td>
</tr>
<tr>
<td><em>Chenopodium album</em></td>
<td>49</td>
<td>29.69</td>
</tr>
<tr>
<td><em>Imperata cylindrica</em></td>
<td>47</td>
<td>28.48</td>
</tr>
<tr>
<td><em>Chenopodium murale</em></td>
<td>46</td>
<td>27.88</td>
</tr>
<tr>
<td><em>Asphodelus sp.</em></td>
<td>37</td>
<td>22.42</td>
</tr>
<tr>
<td><em>Eucalyptus sp.</em></td>
<td>36</td>
<td>21.82</td>
</tr>
<tr>
<td><em>Brassica campestris</em></td>
<td>35</td>
<td>21.21</td>
</tr>
</tbody>
</table>
### Figure 2: Allergens Used for Allergy Testing

<table>
<thead>
<tr>
<th>TREES PRICK ID</th>
<th>WEEDS PRICK ID</th>
<th>MOLDS PRICK ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxelder-Maple</td>
<td>Ragweed Mix</td>
<td>Birch Mix</td>
</tr>
<tr>
<td>Sycamore</td>
<td>English Plantain</td>
<td>Cedar, Mountain</td>
</tr>
<tr>
<td>Hackberry</td>
<td>Russian Thistle</td>
<td>Pine Mix</td>
</tr>
<tr>
<td>Walnut</td>
<td>Lambs Quarter</td>
<td>Meadow Fescue</td>
</tr>
<tr>
<td>Elm</td>
<td>Careless-Pigweed</td>
<td>Johnson</td>
</tr>
<tr>
<td>Oak Mix</td>
<td>Marshelder-Poverty</td>
<td>Timothy</td>
</tr>
<tr>
<td>Pecan</td>
<td>Dock, Sorrel</td>
<td>Bahia</td>
</tr>
<tr>
<td>Willow</td>
<td>Cocklebur</td>
<td>Kentucky Blue</td>
</tr>
<tr>
<td>Ash</td>
<td>Mugwort</td>
<td></td>
</tr>
<tr>
<td>Beech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cottonwood</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**ALLERGEN TESTING**

Name: ________________________ Date: ________________________

MEDICATION WHICH MAY AFFECT TESTING

Date of Birth: __________ Sex: __________

MEDICATION DATE OF LAST DOSE

Location of Test(s): ____________________________

---

**TREES PRICK ID**

- Boxelder-Maple
- Sycamore
- Hackberry
- Walnut
- Elm
- Oak Mix
- Pecan
- Willow
- Ash
- Beech
- Cottonwood

**WEEDS PRICK ID**

- Ragweed Mix
- English Plantain
- Russian Thistle
- Lambs Quarter
- Careless-Pigweed
- Marshelder-Poverty
- Dock, Sorrel
- Cocklebur
- Mugwort

**MOLDS PRICK ID**

- Birch Mix
- Cedar, Mountain
- Pine Mix
- Meadow Fescue
- Johnson
- Timothy
- Bahia
- Kentucky Blue
- Redtop

**ENVIRONMENTALS PRICK ID**

- Dust Mite F.
- Dust Mite P.
- Cat 1 (Hair)
- Cat 2 (Pelt)
- Dog

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to be cont..
of D. farinae. 43.64% were sensitized to D. pteronyssinus. 38.79% were sensitized to G. destructor, 37.56% were sensitized to T. putrescentiae, and 34.55% were sensitized to A. siro (Table 5).

From the pollens, allergens of *Parthenium hystophorus*, *Morus alba*, *Ageratum spp*, *Cannabis sativa*, *Pennisetum typhoides*, *Amaranthus*, *Xanthium strumarium*, *Chenopodium album*, *Imperata cylindrica*, *Chenopodium murale*, *Asphodelus spp*, *Eucalyptus spp* and *Brassica compestris* were selected. It has been observed that 41.82% were sensitized to *Parthenium hystophorus*, 35.15% were sensitized to *Morus alba*, 34.55% were sensitized to *Ageratum spp*, 31.52% were sensitized to *Cannabis sativa*, 31.52% were sensitized to *Pennisetum typhoides*, 30.91% were sensitized to *Amaranthus spp*, 30.91% were sensitized to *Xanthium strumarium*, 29.69% were sensitized to *Chenopodium album*, 28.48% were sensitized to *Imperata cylindrica*, 27.88% were sensitized to *Chenopodium murale*, 22.42% were sensitized to *Asphodelus spp*, 21.82% were sensitized to *Eucalyptus spp* and 21.21% were sensitized to *Brassica compestris* (Table 6).

Total IgE levels were detected in the patients with AR, Asthma and both AR and asthma. Total IgE levels were found to be higher in individuals who were sensitive to pollens followed by dust mites in all categories of allergy patients (Allergic rhinitis, Asthma and Both). IgE levels were significantly high in the patients who were sensitive to all the allergens i.e. pollens and dust mites (Table 7).

**DISCUSSION**

Dust mite and pollen antigens play an important role in the position of allergies. Indoor level of these allergens plays a major role in the development of sensitization and triggering asthmatic attack.
Immunoglobulin E specific antigens (allergens) induces type 1 hypersensitivity (allergic) respiratory reaction in sensitized subjects causing rhinitis or asthma (Horner et al., Hebling, 1995). The qualitative knowledge of these allergens in a given region is of great importance and concerned as they cause several respiratory diseases and skin diseases when inhaled. The present study intended to explore the clinical profile of the individuals who were sensitized to different type of aeroallergens and to find out their relation with skin test. The overall incidence of allergy to various allergens in our study was found to be significant. The incidence of allergy to dust mites allergen sensitivity has been found to be the most significant (37.58%) followed by and pollens only (29.09%).

Skin prick test was found to be most reliable and available method for allergen sensitivity. (Bapna and Mathur, 1990). In which SPT was accepted as gold standard, in vitro testing has proved less sensitive. Reported sensitivities has ranged from 4% to 92.2%, present studies showed that skin test positivity was 96.97% in properly selected cases. The present studies demonstrate if the case has been selected properly after taking thorough history and preliminary basic investigation of the patient, the incidence of positivity of skin prick tests appears to be quite high. Among the individuals who were sensitized to allergens, 37.58% of the individuals were sensitized to dust mites, 30.30% were sensitive toward pollens and dust mites, 29.09% were sensitive to pollens.

The role of mites in causing allergies however remained vaguely defined for a long time till Spieksma and Boezman (1967) suggested that the mite Dermatophagoides pteronyssinus, which is commonly found in house dust, was chief cause of its allergenicity. Studies by Miyamato et al., (1968) and Mithchell et al.
According to them Eucalyptus sp. did not show any markedly positive skin reaction among the patients of nasobronchial allergy. In present study the antigenic extract of Morus alba and Ageratum sp. showed high incidence of allergenicity i.e. 41.82%, 35.15% and 34.55% respectively. These findings are in accordance with Agashe et al. 1983; Malik et al. 1990. Whereas these findings are in contrary to the observations made by Rajkumar, 2003; Boral et al. 2004; Chauhan and Goyal, 2006 from other parts of the country where they registered moderate skin reactivity to Parthenium hystrophorus and Morus alba. 

The role of the different pollen allergens varies with environment conditions, such as climatic factors, pollution and degree of exposure. The knowledge on diurnal, seasonal and annual fluctuations in airborne pollen in any geographical area is essential for effective diagnosis and treatment of pollen allergy. Because of change in the climatic conditions, observation on diurnal and seasonal prevalence becomes very important (D'Amato et al. 2002). Therefore a continuous monitoring of aerial pollen diversity is important.

In Conclusion, the present study was intended to identify Dust mites and pollens that are responsible for allergic rhinitis and asthma in the population of north India. Proper history taking followed by skin tests, total/specific IgE in vitro tests, fungal culture in specific cases are helpful in the diagnosis of allergic manifestations and their treatment.

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