DISCUSSION
This study was carried out as allergic diseases are one of the important causes of morbidity and also to know the effect of Intestinal parasitemia in allergic disorders and on eosinophil count.

A sample of 55 children consisting of 38 allergic patients and 17 children as control were taken. The children were assessed by skin prick test, Eosinophil count and role of intestinal parasites in allergy.

As age has an effect on skin prick test reactions, so an effort was made to know the effect of age on skin prick test reactions and effect of family history on atopy or allergy.

Out of 38 allergic cases, 23 cases were of childhood asthma/Bronchial asthma, 3 cases of allergic rhinitis, 7 cases of urticaria and 5 cases of rhinitis with bronchial asthma.

Cases diagnosis was based on detailed history, clinical examination and specific investigations like PEFR (Peak expiratory flow rate). PEFR was measured by using Wright's mini peak flow meter. Due attention was given on frequency of attacks, age of onset, history of worm infestations and family history of allergy.

Eosinophil count was done and it was tried to find out its relation with intestinal parasitic infestations and allergic disorders.
Skin prick test was used for allergy testing by using various allergen solutions. The results were read by the use of scale and divider. Buffer solution/histamine was used for positive control and saline for negative control.

Stool examination for ova and cyst was done by light microscopy.

**FAMILY HISTORY OF ALLERGY**

As it was outlined in Table VI positive family history of atopy was found in 39.13% cases of bronchial asthma, 66.6% cases of allergic rhinitis, 14.28% cases of urticaria and 40% cases of rhinitis with bronchial asthma. None of the control group cases have had positive family history in the present study.

Adkinson (1920) in a study of 400 asthmatic patients showed that 48% cases had a positive family history. In 1924, Spain and Cooke observed 58.4% cases with family history of atopy. Bruce (1958) showed that around 50% of patients of asthma had family history of atopy. Lubs (1971) evaluated that risk of atopy was about 33% when both parents were atopic and 24.29% when one parent was atopic, whereas when neither parent was atopic, risk was around 14-25%. Kuehr et al (1993) evaluated that maternal status is more predictive than that of father with regard to child's risk of sensitization.

Pife et al (1981) detected atopy only in 20% cases of asthmatic children studied. Jha et al (1975) in
their study at Varanasi showed 61% cases of asthma, 45% cases of rhinitis and 76.5% cases of asthma with rhinitis had family history as compared with present study which showed these values as 39.13%, 66.6% and 40% respectively. Out of 7 our cases of urticaria, 1 had positive family history.

Helpern (1985) observed that at least half of all children presenting with urticaria were atopic. In present study only 14.28% cases of urticaria had a positive family history, which is also in concordance with Champion's observations who also observed that there was no solid evidence that patients with history of atopy had increased incidence of chronic urticaria. Kuehr et al (1992) also observed parental atopy, low gestational age, and male gender as independent risk factor for sensitization to serum allergens at school age.

EOSINOPHIL COUNTS IN VARIOUS CLINICAL GROUPS

In present study, the average eosinophil count of allergic disorders was 69.43% as compared with 11.76% of control group, which is statistically significant (p < 0.001). Thus the eosinophil count was higher in allergic cases as compared with control in the present study.

Stickney et al (1944) showed that eosinophilia was one important finding in patients with allergic disorders likewise the present study also showed eosinophilia in various allergic groups of disorders. As type I hypersensitivity reactions mediated by IgE; is of greatest interest
to allergist, and as eosinophil derived molecules of potent biologic activity may contribute to tissue injury in IgE mediated diseases.

<table>
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<th>Mediator</th>
<th>Actions</th>
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<tr>
<td>Eosinophil chemotactic factor of anaphylaxis (ELF-A)(preformed)</td>
<td>Chemotactic attraction and deactivation of eosinophils. Increase in eosinophil complement receptors.</td>
</tr>
</tbody>
</table>

As presented in table III, patients with bronchial asthma, allergic rhinitis had mean eosinophil count of 8% while patients with rhinitis and bronchial asthma had 7%. Acharya (1983) also reported eosinophilia of 10-14% in his study on childhood asthma.

In our study around 73.91% of cases of bronchial asthma were having absolute eosinophil count more than 250 cells/cumm. Cases with urticaria had 57.14% and those with allergic rhinitis had 66.67%, while 80% cases of rhinitis with bronchial asthma showed eosinophilia. In control group eosinophilia was seen in 11.76% cases. Eosinophilia was highest in cases with rhinitis and bronchial asthma mean count being 790 cells/cumm.

Lowell (1967) and Sharma (1974) in their study also reported eosinophilia in majority of cases of bronchial asthma. In present study 17 out of 23 cases of bronchial asthma (73.91%) had eosinophilia, while previous studies on asthma patients (Sharma, 1974; Arshad et al., 1981 and Saxena, 1983) reported eosinophilia in 71.8%, 56% and 45.13% cases respectively.
Some author's are of opinion that eosinophil count may be decreased as a result of intercurrent infections and as stress and corticosteroids causes eosinopenia (Lowel, 1967). But normal results should have obtained 2-3 times before it is concluded that eosinophilia not present (Nelson, 1983).

EOSINOPHIL COUNT AND ITS RELATION WITH INTESTINAL PARASITIC INFESTATIONS

It was noticed in present study that the cases who were suffering from parasitic infection showed a higher eosinophil count. In 7 cases of urticaria eosinophil percentage (mean) was 5. Stool examination was done in 4 cases, out of these 2 cases were positive for protozoal infestation. Among these 2 cases one case had absolute eosinophil count more than 250 cells/cumm (Table III and V).

Thus it seems that eosinophil count is increased in cases suffering from parasitic infection/infestation.

SKIN PRICK TEST REACTION

In the Western countries, erythema forms the major parameter for positivity (Norman 1980 and King et al, 1962), but Agarwal (1982) suggested to measure wheal in Indians as erythema on skin was not intense and also as the general complexion of Indians is dark. In the present study both flare and wheal were measured.

In the present study, skin testing was done by modified prick method as positive skin tests obtained by

The use of histamine in skin prick testing was recommended for optimal evaluation of allergen hypersensitivity (Nelson, 1983 and Malling, 1984). In the present study histamine was used as a positive control. It has been demonstrated that histamine reactivity was lower in infants and elderly. Brociek (1985) has proposed that reactivity to histamine increased until adulthood was reached and decreased after 50 years. Lessof et al (1980) was of opinion that since size of skin prick test reaction to histamine varied with age, the interpretation of skin prick tests should not only take into account the wheal size but rather a ratio between histamine induced and allergen induced wheals. That's why in present study this ratio was used for interpretation of results.

In the present study out of 11 cases of asthma who showed reactivity to one or more allergens, 7(63.6%) were resident of urban area while 2(18.1%) were of rural area. Residency in urban areas was an indicator of increased reactivity as proved by multivariate analysis (Garger, 1986). Linna (1974) also found in his study that skin reactivity was more in urban dwellers. Breborowicz
et al (1994) showed that living in urban as compared with rural areas, is associated with an increased prevalence of respiratory symptoms and sensitization to allergens.

It has been asked whether circadian rhythm affects the skin prick test results. Reinberg et al (1985) showed maximum skin reactivity between 7-11 pm and minimum at 7 a.m.. Lee et al (1977) confirmed these findings and suggested that false negative readings could be the result of early morning hours testing. In present study the skin testing was done between 10 a.m. to 1.0 p.m., as this was the O.P.D. time and follow up of patients could not be done in evening hours, this was neither too early nor too late.

HISTAMINE RESPONSE AT VARIOUS AGES

In our study, in asthma cases, histamine reactivity showed an increasing trend as the age advances (Table IV). In asthma cases maximum reactivity was 31 mm in 7 years old including both flare and wheal with multiple pseudopodia. Brociek et al (1985) observed increased histamine reactivity from infancy to adulthood. Same observations were of the Barbee et al (1981). Present study has also the same results.

Skin prick test was done in a 7 month old male child suspected suffering from milk allergy. The child showed pin point erythema at the prick sites of milk, saline and histamine. The size was around 1 mm. This
confirmed the observations that skin test reactivity to 
histamine was lower in infants when compared with adults 

Meinert and Frischer et al (1994) suggested 
that the ratio of criterion, which relates the size of 
the allergen wheal to the size of histamine wheal, is the 
most appropriate SPT criterion because it is not affected 
by growth of allergen wheals in childhood and it appears 
to compensate for possible observer bias.

**PRICK TEST IN RESPIRATORY ALLERGY**

In present study, there were 23 cases of asthma 
and prick test was done in 18 cases. Out of 18 cases 
11 (61.11%) were positive (Table VIII). Sethi et al (1986) 
reported positive allergy test in 41.27% cases of asthma. 
Shivpuri and Singh (1965) reported positive response in 
32.5% cases of bronchial asthma both adults and children. 
Bronchial allergy cases mostly gave positive reaction to 
more than one group of allergen. Single allergen sensi-
tivity was seen in few cases only (Table X). So it was 
concluded that bronchial allergy occurred usually due to 
multiple allergens.

study

In the presented above 9 (40.91%) cases of respi-
ratry allergy were found positively reacting to dust 
allergens (Table X). The second commonest allergen was 
of insects (27.27%).

Pherwani et al (1985) found 81.25% cases allergic 
to insects. The second common allergen was dust (71.9%)
in their study. In present study higher incidence of dust allergy could be explained on the basis of environment of Bundelkhand which is dry and a similar situation was noticed by Jha et al (1975) from Varanasi.

In our study, 2 (9.09%) cases gave positive reaction to fungus. Pherwani et al (1985) showed 40.6% positive cases to fungus.

PEFR was measured by Wright's mini peak flow meter. In 15(78.91%) out of 19 cases of bronchial asthma PEFR was measured (Table XII). The peak expiratory flow rate showed a decreased values in all age groups. When they were compared with control subjects.

Swaminathan et al (1993) in their study found that pulmonary function test are useful in assessing the response degree of airway obstruction, in measuring response of airway to inhaled allergens, chemicals or exercise in assessing the response to therapeutic agents, and in evaluating the long term course of disease.

Test of significance 't' test was applied. This observation shows that there is a relationship between PEFR and bronchial asthma (p <0.05).

**INSECTS AND ALLERGY**

In this study, 6(27.27%) cases gave positive response to insects allergen, Mosquitoes were the common among insect allergens in present study. Pherwani et al (1985) noticed the insect allergy in following sequence:
First by cockroach allergens followed by mosquitoes, housefly and D. farinae allergens. Shankar (1974) noticed the order as house fly, mosquitoes and cockroach allergens.

**DUST IN BRONCHIAL ALLERGY**

Nine (40.91%) cases of bronchial allergy in present study gave positive results to dust. Among dust house dust (35.71%) was the commonest. Next common dust was cotton dust (21.42%) and wheat dust (17.85%) (Table XI). Jha et al (1975) also noticed that house dust allergy was more common, similar to that seen in present study. Shankar et al (1979) reported highest positivity rate with cotton dust.

Sethi et al (1986) reported highest positivity rate with rice dust. Comparison of results of dusts allergy reported by different investigators on bronchial allergy in percentage as given below:

<table>
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<tr>
<th>Authors</th>
<th>Dust</th>
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<tbody>
<tr>
<td></td>
<td>House</td>
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<tr>
<td>Present study</td>
<td>35.71</td>
</tr>
<tr>
<td>Pherwani et al (1985) Bombay</td>
<td>31.25</td>
</tr>
<tr>
<td>Sethi et al (1975) Raipur</td>
<td>42.00</td>
</tr>
<tr>
<td>Jha et al (1975) Varanasi</td>
<td>34.80</td>
</tr>
<tr>
<td>Shankar et al (1979) Gwalior</td>
<td>3.50</td>
</tr>
</tbody>
</table>

The variations in dust allergy as shown by various workers could be possibly explained on the environmental factors.
CORRELATION OF INTESTINAL PARASITIC INFESTATIONS WITH SKIN PRICK TEST

In our study, out of 38 cases, skin prick test was done in 29 allergic cases and it was tried to find out a relation between intestinal parasitic infestation and skin prick test positivity (Table V).

In bronchial asthma, stool examination was done in 18 cases. Out of these 18 cases, 13 (72.2%) cases showed a negative stool result, but among these 8 (61.5%) cases were positive to skin prick tests.

The remaining 5 (27.8%) cases who showed a positive stool examination result, the skin prick test was positive in 3 cases (60%).

In allergic rhinitis patients stool examination was done in 2 cases. None of them was positive on stool examination, but among these 2 cases, one case showed positive skin prick test.

In urticaria stool examination was done in 4 cases, 2 showed positive result and 2 showed negative result, and among these, one case each was positive for skin prick test.

But in cases of bronchial asthma associated with allergic rhinitis even though stool examination was negative yet the skin prick test was positive in one case. Jarrett (1972) suggested that potentiation of allergy as a result of parasitic infestation. Twarog (1983) opined that parasitic infestations should be considered in individuals having urticaria, specially in those who came from an
endemic area, had peripheral eosinophilia and who had elevated IgE.

Out of 7 stool positive cases 4 (57.14%) were positive for skin prick test and out of 20 stool negative cases 11 (55%) showed a positive SPT (p 70.05) and difference is highly insignificant, which implies that there is no relation with skin prick test positivity or negativity with stool parasitemia.

**FOOD AND ALLERGENS**

In present study 2 out of 7 (28.57%) of urticaria were positive for food allergen, one each for Dal Urad and Egg (Table VIII). But positive reaction to food allergens in bronchial allergy was not observed. Pherwani et al (1985) reported 61.5% cases positive to one or more food allergens in asthma.

One infant was diagnosed as a case having allergy to milk. Hofman et al (1992) also found food allergens as causative factors of respiratory, skin and gastrointestinal allergy confirmed by skin prick test.

**POLLENS IN RESPIRATORY ALLERGY**

The pollens used in the present study were ten viz. Adhatoda vasica, Amaranthus hybridus, Artemisia scoporia, Brassica Campestris, Chenopodium album, Holoptelia integrifolia, Parthenium hysterophorus, Prosopis juliflora, Sorghum vulgare, Suaeda fructicosa. Five (22.73%) cases gave positive reaction to pollens. Positive reaction to
pollen of *parthenium hysterophorus* was commonest in the present study. Out of 5 pollens sensitive cases, 3 gave positive reaction to this pollen. This can be understood by knowing that there is high growth of *parthenium* in Bundelkhand region.

Pherwani et al (1985) noticed in their study that pollen of *Amaranthus spinosus* and *coccus nuciferus* were most common followed by *Parthenium*, giving the positive results, in the area of Bombay.