RESULTS

In this study 76 asthmatic patients attending the Chest Department , Benha University Hospital , Zagazig University , in the period from November 1997 to October 1998 with age range from five to sixty two years old were subjected to the following parameters :

1- Complete case history taking using the allergy history sheet .

2- Careful chest examination .

3- Plain x- ray to exclude other chest or cardiac diseases .

4-Ventilatory functions before and after bronchdilator to detect reversibility of the bronchial spasm .

5- Stool analysis to exclude parasitic infestations .

6- Skin testing using ten different allergens that are commonly found in the environment , and prepared in Microbiology and Immunlogy department , Benha Faculty of Medicine , Zagazig University .

- Out of these 76 patients 28 patients gave positive skin testing to house dust , 25 of them gave abnormal ventilatory functions and 3 of them gave normal ventilatory functions

- The 25 patients that gave positive skin testing to house dust with altered ventilatory functions were selected to detect the specific IgE levels to house dust allergen .

- Statistical analysis to the information obtained were done using the following :

* Mean (range) (x) : $\frac{\text{summary of values recorded in observation}}{\text{No. of observations}}$

* Standard deviation (SD) : It shows the extent of deviation of observation from their mean .

* t-test : test for significance for small number of observations .

*Z value : test for significant between two percents .

* Sensitivity is the ability of the test to detect truly positive cases :

$$= \frac{\text{Truly + ve}}{\text{Truly +ve + False -ve}}$$

* Specificity is the ability of the test to detect truly negative cases :

$$= \frac{\text{Truly -ve}}{\text{Truly -ve + False +ve}}$$

* Positive predictive value is the proportion of individuals who test positive and indeed are diseased : $= \frac{\text{Truly +ve}}{\text{Truly +ve + False +ve}}$

* Negative predictive value is the proportion of individuals who test negative and indeed are healthy : $= \frac{\text{Truly -ve}}{\text{Truly -ve + False -ve}}$

- All the above parameters gave the following results :

Table (1) : Number and Percentage of cases of bronchial asthma due to atopic causes to non atopic causes :

CASES	NUMBER	PERCENTAGE
Atopic Asthma	33	43.4 %
Non Atopic Asthma	43	56.6 %
Total	76	100 %

This table shows that out of 76 patients (the studied group) , 33 (43.4%) patients were atopic and 43 were non atopic .

Table (2) : relation of sex with results of skin tests in cases of bronchial asthma :

Sex Groups / Skin Test	MALES		FEMALES		TOTAL	
	NO.	%	NO.	%	NO.	%
Positive Skin Test	14	18.5 %	20	26.3 %	34	44.7 %
Negative Skin Test	24	31.5 %	18	23.7 %	42	55.3 %
Total	38	50%	38	50%	76	100 %

This table shows that out of 76 patients (the studied group) , 38 (50%) were males and 38 (50%) were females .

- 14 (18.5%) cases of males were skin test positive to various allergens used and 24 (31.5%) were skin test negative .
- 20 (26.3%) cases of females were skin test positive to various allergens used and 18 (23.7%) were skin test negative .

Table (3) Distribution of age in cases of bronchial asthma :

AGE GROUPS	NO. of cases	%	X	SD	RANGE	
					Min	Max
5-15 years old	17	22.4%	12.56	2.5	5	15
16-25	8	10.5%	19.71	3.49	16	24
26-35	23	30.3%	33.9	2.04	28	35
36-45	12	15.8%	41.3	2.9	36	45
46-55	9	11.8%	51.3	2.56	48	55
more than 55 years old	7	9.2%	57.25	1.5	56	62
Total	76	100%	36.03	0.68	5	62

This table shows that the age distribution in 76 asthmatic patients was as follows :

- 23 (30.3%) cases were the most common age group affected from 26-35 years old .
- 17 (22.4%) cases were in the age group from 5-15 years old .
- 12 (15.8%) cases were in the age group from 36-45 years old .
- 9 (11.8%) cases were in the age group from 46-55 years old .
- 8 (10.5%) cases were in the age group from 16-25 years old .
- 7 (9.2%) cases were in the age group above 55 years old .

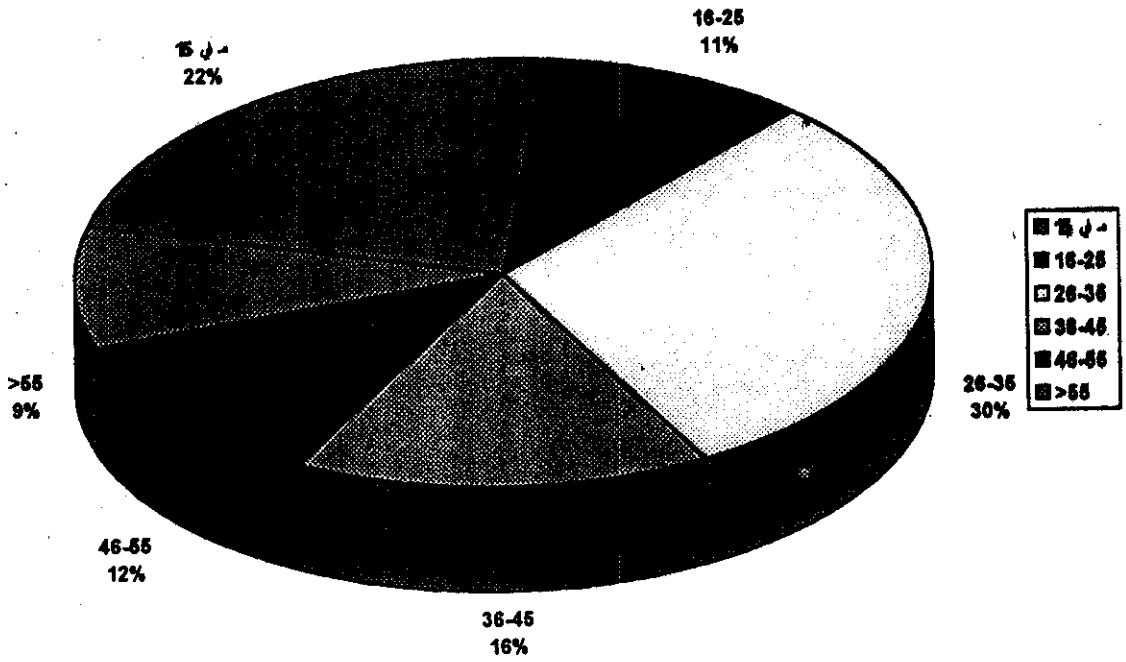

Fig (1) : represents the distribution of age in cases of bronchial asthma .

Table (4) : Clinical Parameters of cases of bronchial asthma :

Clinical Parameters		Number	Percentage
Duration of illness	< 5 years	29	38.1%
	5-10 years	33	43.4%
	>10 years	14	18.4%
Symptoms	Dyspnea	70	90.9 %
	Wheezes	71	93.4 %
	Cough	66	86.8 %
	Expectoration	50	65.7 %
Other Allergies	Nasal	30	39.4 %
	Skin	15	19.7 %
	Eye	12	15.7 %
	Food	10	13.1 %
Family History		10	13.1 %
Seasonal Variation	Winter	50	65.7 %
	Summer	15	19.7 %
	Spring	54	71.05 %
	Autumn	43	56.5 %
Diurnal Variation	Night	60	78.9 %
	Morning	13	17.1 %
Precipitating Factors	Infection	77	100 %
	Food	10	13.1 %
	Drug	3	3.9 %
	Exercise	30	39.4 %
	Smoking	50	65.7 %
	Change of weather	77	100 %
	Emotions	33	43.4 %

This table shows that :- Most patients have more than one symptoms .

- Dyspnea and wheezes are the most common symptoms in these patients.
- Most patients have allergies other than asthma .
- Seasonal variation play an important role in bronchial asthma .
- Most patients develop asthma at night .
- Most patients have more than one precipitating factor and the most common precipitating factor are infection and change in the weather .

Table (5) :Incidence of Positive Skin Test for the Most Common Allergens in 76 Cases suffering from Bronchial Asthma :

ALLERGEN USED	NO. of +ve skin test cases	%
1- House Dust	28	82.3 %
2- Hay Dust	10	29.4 %
3- Cotton Dust	10	29.4 %
4- Pollen	11	32.3 %
5- Mixed Fungi	3	8.8 %
6- Wool	-	0 %
7- Goat Hair	1	2.9 %
8- Dog Hair	-	0 %
9- Rabbit Hair	-	0 %
10- Mixed Feathers	-	0 %
more than one Allergen	14	41.2 %
Controls (-ve for all allergens)	10	

Out of 76 asthmatic patients , the present study revealed that :

- House dust is the most common allergen giving positive skin test in 28 (82.3%) patients .
- 11 (32.3%) patients gave positive skin test to pollen allergen .
- 10 (29.4%) patients gave positive skin test to each of hay and cotton dust allergens .
- 3 (8.8%) patients gave positive skin test to fungal allergen .
- only one (2.9%) patients gave positive skin test to goat hair allergen .
- 14 (41.2%) patients gave positive skin test to more than one allergen .

Fig (2) :Incidence of positive skin test for the most common allergen in the studied group

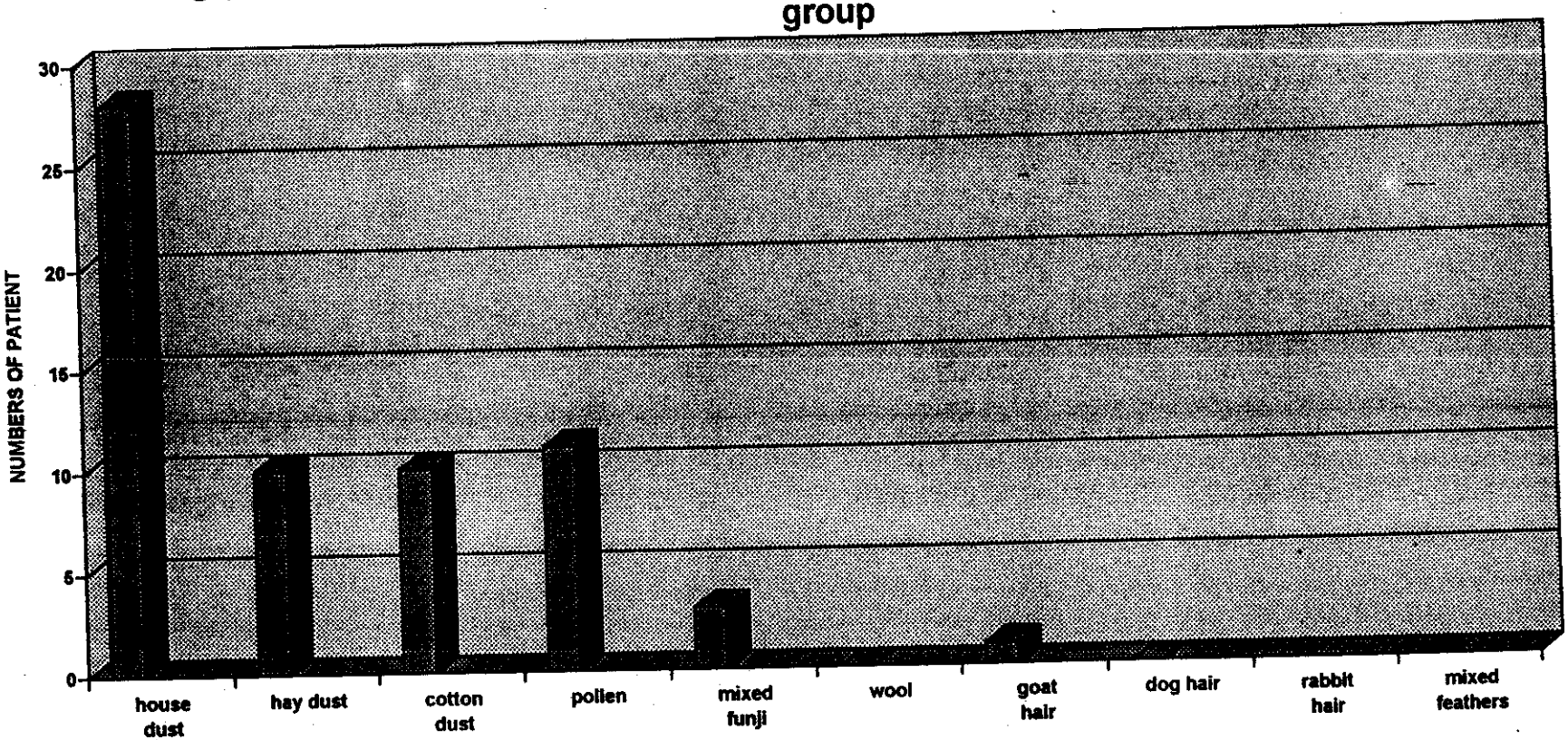

Table (6) : Grades of Skin Test in 25 asthmatic patients due to house dust versus control group :

Grades of skin tests	Skin Test							
	NO.	%	X	SD	t	P	Range	
							Min	Max
Grade 4	3	8 %	18.66	2.3	3.3	<0.05 (S)	16	20
Grade 3	7	20 %	15	0	4.9	< 0.01 (HS)	15	15
Grade 2	7	20 %	12	0.5	4.28	< 0.01 (HS)	11	13
Grade 1	8	22 %	10	0	6.5	<0.05 (S)	10	10
Negative (controls)	10	29.2 %	5	1.58				

The present study revealed that :

(A) 10 (29.2%) patients have randomly been chosen from those who gave negative skin test and served as a control group .

(B) Out of 25 patients giving positive skin test to house dust allergen , the present study revealed that :

- 3 (8%) patients gave grade 4 skin test .
- 7 (20%) patients gave grade 3 skin test .
- 7 (20%) patients gave grade 2 skin test .
- 8 (22%) patients gave grade 1 skin test .

Table (7) : Grades of Specific IgE to house dust allergen in 25 asthmatic patients :

Grades of specific IgE	Specific IgE to house dust allergen		
	NO.	%	X
Very High	3	12 %	1.56
High	7	28 %	0.54
Moderate	6	24 %	0.133
Mild	4	16 %	0.097
Equivocal	3	12 %	0.064
Absent	2	8 %	0.039

Out of 25 asthmatic patients who gave positive skin test to house dust allergen and whom are tested for IgE specific for house dust , the present study revealed that :

- 3 cases (12%) gave very high levels of specific IgE .
- 7 cases (28%) gave high levels of specific IgE .
- 6 cases (24%) gave moderate levels of specific IgE .
- 4 cases (16%) gave mild levels of specific IgE .
- 3 cases (12%) gave equivocal levels of specific IgE .
- 2 cases (8%) gave undetectable levels of specific IgE .

Table (8) : Comparison between the validity and the predictive value of reference test (specific IgE) and screening test (Intradermal skin test) in 25 asthmatic patients :

Reference test / Screening test	Specific IgE							
	Positive		Negative		Total		Z	P
	NO.	%	NO.	%	NO.	%		
Skin test								
Positive	23	92%	2	8%	25	100%	4.2	P < 0.05
Negative	0	0%	0	0%	0	0%	0	P >0.05
Total	23	92%	2	8%	25	100%		

Out of 25 asthmatic patients who gave positive skin test to house dust allergen and whom are tested for IgE specific for house dust , the present study revealed that :

- 23 cases (92%) had positive skin test to house dust allergen and positive specific IgE results .
- 2 cases (8%) had positive skin test to house dust allergen and negative specific IgE results .

Sensitivity of Intradermal Skin Test = 89.2 %

Specificity of Intradermal Skin Test = 83.3 %

Positive predictive value of intradermal skin test = 92 % .

Negative predictive value of intradermal skin test = 100 %

Sensitivity of specific IgE = 92%

Specificity of specific IgE = 100%

Positive predictive value of specific IgE = 100%

Negative predictive value of specific IgE = 83.33%

Table (9) : Grade of Intradermal Skin test positivity to house dust versus allergen specific IgE class among 25 asthmatic patients :

Tested Groups	No. of patients	Grade of ID Skin Test	EAST Class of Specific IgE	Level of Specific IgE
Bronchial asthmatic	3	+4	4	Very high
	7	+3	3	High
	6	+2	2	Moderate
	1	+2	1	Low
	3	+1	1	Low
	3	+1	1/0	Equivocal
	2	+1	0	Absent (undetectable)

Out of 25 asthmatic patients who gave positive skin test to house dust allergen and whom are tested for IgE specific for house dust , the present study revealed that :

- 3 patients gave grade 4 skin test and EAST class 4 specific IgE .
- 7 patients gave grade 3 skin test and EAST class 3 specific IgE .
- 6 patients gave grade 2 skin test and EAST class 2 specific IgE .
- 1 patient gave grade 2 skin test and EAST class 1 specific IgE .
- 3 patients gave grade 1 skin test and EAST class 1 specific IgE .
- 3 patients gave grade 1 skin test and EAST class 1/0 specific IgE .
- 2 patients gave grade 1 skin test and EAST class 0 specific IgE .

The results of intradermal skin test and specific IgE level are highly correlated (significant) .

Table (10) : Specific IgE level versus ventilatory functions in 25 house dust asthmatic patients :

Level of Specific IgE	Ventilatory Functions							
	Mild obstruction		Moderate obstruction		Severe obstruction		Total	
	NO.	%	NO.	%	NO.	%	NO.	%
Very high	0	0 %	0	0%	3	37.5%	3	13.04%
High	0	0 %	2	25%	5	62.5%	7	30.4%
Moderate	0	0%	6	75%	0	0%	6	26.08%
Low	4	44.4%	0	0%	0	0%	4	17.39%
Equivocal	3	33.3%	0	0%	0	0%	3	13.04%
Absent	2	22.3%	0	0%	0	0%	2	0%
Total	9	100%	8	100%	8	100%	25	100%

Out of 25 asthmatic patients who gave positive skin test to house dust allergen and whom are tested for IgE specific for house dust , the present study revealed that :

- 9 cases with mild obstruction , out of them 4 cases (44.4%) had low level of specific IgE , 3 cases (33.3%) had equivocal level of specific IgE , and 2 cases (22.3%) had undetectable level of specific IgE .
- 8 cases with moderate obstruction , out of them 2 cases (25%) had high level of specific IgE , and 6 cases (75%) had moderate level of specific IgE .
- 8 cases with severe obstruction , out of them 3 cases (37.5%) had very high level of specific IgE , and 5 cases (62.5%) had high level of specific IgE .

Table (11) : Intradermal Skin test to 25 house dust positive asthmatic patients versus ventilatory functions :

Grade of Skin Test	Ventilatory Functions							
	Mild obstruction		Moderate obstruction		Severe obstruction		Total	
	NO.	%	NO.	%	NO.	%	NO.	%
4	0	0%	0	0%	3	30%	3	7.5%
3	0	0%	2	15.4%	5	50%	7	17.5%
2	0	0%	7	53.8%	0	0%	7	17.5%
1	7	58.3%	1	7.6%	0	0%	8	32.5%
Negative (control)	5	41.7%	3	23.2%	2	20%	10	25%
Total	12	100%	13	100%	10	100%	35	100%

Out of 25 asthmatic patients who gave positive skin test to house dust allergen and 10 control patients, the present study revealed that :

- 12 cases with mild obstruction , out of them 7 cases (58.3%) gave grade 1 skin test and 5 cases (41.7%) gave negative skin test .
- 13 cases with moderate obstruction , out of them 2 cases (15.4%) gave grade 3 skin test , 7 cases (53.8%) gave grade 2 skin test , 1 case (7.6%) gave grade 1 skin test and 3 cases (23.2%) gave negative skin test .
- 10 cases with severe obstruction , out of them 3 cases (30%) gave grade 4 skin test , 5 cases (50%) gave 3 skin test , 2 case (20%) gave negative skin test .