



CLINICAL AND EPIDEMIOLOGICAL STUDY OF BRONCHIAL ASTHMA IN CHILDREN & ASSESSMENT OF SEVERITY OF ASTHMA AND ITS CORRELATION WITH SERUM IGE LEVELS

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ABSTRACT

AIM - To assess the severity of Asthma; to estimate serum IgE levels and to compare the serum IgE levels in mild, moderate and severe grades of Asthma.

METHOD- The study population included 75 children from those attending the outpatient as well as those admitted in the department of pediatrics of GMKMCH Salem with symptoms and sign suggestive of bronchial asthma. Severity of asthma was assessed by clinical history and peak flowmetry and the cases were categorized into intermittent mild, moderate and severe grades of asthma based on global initiative for Asthma guidelines. Using Pathozyme Omega Diagnostics IgE Elisa kit serum IgE levels were measured.

RESULT- Serum IgE levels were increased in all 4 categories of asthma patients when compared to normal control groups. As the severity of asthma increased, the serum IgE levels also significantly increased.

CONCLUSION- IgE has found to play a predominant role both in the prevalence and severity of asthma

KEYWORDS : Asthma, IGE, Severity

AIM OF THE STUDY

1. To assess the severity of Asthma clinically and by peak flowmetry and to compare the serum IgE levels in mild, moderate and severe grades of Asthma.

OBJECTIVE OF STUDY

1. To assess the severity of Asthma clinically and by peak flowmetry and estimate serum IgE levels in Asthmatic children.
2. To compare the serum IgE levels in mild, moderate and severe grades of Asthma
3. To study the association of various epidemiological factor to severity of asthma

TYPE OF STUDY-descriptive Study

PLACE OF STUDY

Department of Pediatrics; Govt. Mohan Kumaramangalam Medical college hospital, Salem – 636001

PERIOD OF STUDY

October 2016 To September 2017

STUDY JUSTIFICATION:

Estimation of serum IgE levels and assessment of severity helps in effective management of asthmatic children. Based, on this study, Anti-IgE therapy will be beneficial as disease modifying agent in moderate to severe asthmatics

SAMPLE SIZE:

All children during the period attending op of gov. mohan kumaramangalam medical college satisfying inclusion criteria.

INCLUSION CRITERIA

Children between 5-12 years of both sexes with symptoms and signs suggestive of asthma.

EXCLUSION CRITERIA

1. Asthmatic who had taken bronchodilator within 24 hrs prior to assessment.
2. Chronic respiratory diseases other than asthma
3. Children with history suggestive of worm infestation.
4. Immunocompromised children.

SOFTWARE STUDY: SPSS

MATERIALS AND METHODS

The study population included 75 children from those attending the outpatient as well as those admitted in the department of pediatrics of Government Mohan Kumaramangalam Medical College Hospital, Salem with symptoms and sign suggestive of bronchial asthma.

Detailed history was taken regarding patients name, age, sex, duration, frequency of symptoms and severity of exacerbations. All cases were provided with a respiratory questionnaire which included questions on respiratory symptoms, passive smoking, family history and previous medical history. Age and sex matched 75 health volunteers were taken as control group.

The study was approved by ethical committee and informed consent was obtained from all cases and controls. Peak flowmetry was carried out in all children, as there was difficulty in obtaining an acceptable FVC curve by spirometry. Severity of asthma was assessed by clinical history and peak flowmetry and the cases were categorized into intermittent mild, moderate and severe grades of asthma based on global initiative for Asthma guidelines.

After taking necessary aseptic precautions, blood samples were collected from each patient. The samples were left undisturbed for about half an hour to allow for clot formation. After complete formation of clot, the samples were centrifuged to separate the serum. The centrifuged samples were stored at -20 °C till the analysis was done.

Using Pathozyme Omega Diagnostics IgE Elisa kit serum IgE levels were measured.

Principle of the Test:

Test sera were applied to specific monoclonal anti IgE antibody coated micro titration wells and incubated with Zero buffer. When human IgE is present in the test sample, it will combine with the antibody on the well. Residual test sample and IgE antibody are washed with the addition of Horse raddish peroxidase enzyme. IgE molecules get sandwiched between the enzyme linked antibodies and solid phase. When a substrate is added, those wells with IgE produce a colour absorbance which is measured at 450nm. The

concentration of IGE is directly proportional to the intensity of colour.

RESULT.

Table. 1 Distribution According to Severity

Severity of Asthma	No. of cases	Percentage
Intermittent	21	28%
Mild Persistent	16	21%
Moderate persistent	24	32%
Severe persistent	16	19%
Total	75	100%

Table 2 Serum IgE levels in Control groups and Cases.

Groups	No. of cases	Average IgE (IU/ml)
Control	75	89.90
Intermittent	21	206.19
Mild	16	501.25
Moderate	24	815.83
Severe	16	1099.3

IgE levels were elevated in cases compared to controls. Severe asthmatics had high serum IgE levels and low levels were found in Intermittent category.

Table.3

S. No	Variables (N=75)	n	%	P Value	Inference	
1	Duration of disease	<4 years	31	41	0.00	Significant association Present
		>4 years	44	59		
2	Sex	Male	46	61	0.26	No Significant association
		Female	29	39		
3	Family History	1	27	36	0.00	Significant association Present
		2	13	17		
		3	5	7		
4	H/o Passive smoking	4	30	40	0.00	Significant association Present
		1	42	56		
		2	33	44		
5	Duration of breast feeding	1	31	41	0.00	Significant association Present
		2	44	59		
6	Personal H/O Allergic conjunctivitis	1	21	28	0.37	No Significant association
		2	54	72		
7	Personal H/O Allergic rhinitis	1	11	15	0.00	Significant association Present
		2	64	85		
8	Personal H/O Atopic eczema	1	46	61	0.00	Significant association Present
		2	29	39		
[Analysis done through Epi Info 6 Version 3.3.2 Software						

Table 22 :Association between IgE values and Clinical grading of Asthma

Clinical grading	n	Mean IgE value	Minimum Ig E Value	Maximum Ig E value	p value*
INTERMITTENT	21	206.1905	70	640	0.00
MILD	16	501.25	465	830	
MODERATE	24	815.8333	795	1170	
SEVERE	14	1099.2857	1040	1220	

*Kruskal-Wallis H test for two groups
Inference :Mean value of Ig E is significantly associated with clinical grading of asthma

Discussion

Asthma is a chronic inflammatory disease of airways with increasing number of hospitalizations in young children worldwide. It poses a significant burden to the patient, family, health care systems and government. With advancement in management protocols and health education there has been a dramatic reduction in morbidity and mortality.

We studied 75 cases with symptoms and signs suggestive of

asthma, who were attending the Outpatient as well as admitted in the Department of Pediatrics of Government Mohan Kumaramangalam Medical College Hospital, Salem from our observations are discussed below.

1. Age Distribution

The proportion of cases in 5-8 years and 9-12 years were 49% and 51% respectively. In our study the prevalence of cases in both age groups were almost equal.

2. Sex Distribution

Among 75 cases 46 were male children and 29 were female children, which corresponds to 61% and 39% respectively. This shows that male are more affected than girls..

3. Distribution according to severity

Children were categorized into intermittent, mild, moderate and severe grades of asthma based on global initiative for asthma guides. The proportion of cases in different categories were 28% , 21% , 32% and 14% respectively. The prevalence of children with moderate asthma was found to be higher

4. Age wise distribution according to severity

In our study between 5-8 years the proportion of cases in Intermittent, mild, moderate and severe grades were 35%, 13%, 30% and 22% respectively. Majority of children in this age group were found to have intermittent asthma. In 9-12 years the proportions of cases in different categories were 21%, 29% 34% and 16% respectively. Most of the children in this age group belonged to moderate category.

5. Serum IgE levels based on Severity

In our study the mean IgE levels in controls and different grades of asthma were 89.90, 206.19, 501.25, 815.83 and 1099.3 correspondingly. Serum IgE levels were increased in all 4 categories of asthma patients when compared to normal control groups. As the severity of asthma increased, the serum IgE levels also significantly increased. Patients with severe bronchial asthma had higher IgE levels, than intermittent, mild and moderate grades.

Serum IgE levels based on Age and Sex

In our study IgE levels was found to be similar in both age groups and both sexes. Eventhough the proportion of cases were high in males, the serum IgE levels did not differ significantly in both sexes. Male preponderance in our study may be related to the airway anatomy than to serum IgE levels.

Familial Predisposition

In our study family history of asthma was present in 60% of the study population. 36% of children had either one of the parent with asthma, 13% of children had one of their grandparents with asthma and around 7% of children had one of the parent as well as one of the grand parent with asthma. There are numerous studies that has revealed that asthma has a strong genetic influence.

In our study also we have found that there is a strong association between parent and grand parent status with the risk of development of asthma which is comparable to previous studies. Also the serum IgE levels in this study were higher in children who had parents and grand parents with asthma. This reflects that the severity was high in this group.

Passive smoking

In our study among 75 cases, 40 children had exposure to tobacco smoke. The severity of asthma and serum IgE levels was found to be higher in these children compared to those without a history of passive smoking. Passive smoking influences on the severity of asthma by increasing the bronchial responsiveness.

Personal History of Atopy:

In our study the Proportion of cases with history of allergic conjunctivitis, rhinitis and eczema were 41%, 61% and 16% respectively.

The severity was more in children with eczema who had elevated levels of serum IgE compared to allergic rhinitis and conjunctivitis. But Majority of children had history of allergic rhinitis. It has been estimated that around 50-70% of children with atopic eczema subsequently develop asthma. In our study there is strong correlation between eczema and severity of asthma.

Breast feeding

In our study, 31 (41.4%) cases were breastfed for more than 6 months and 44 (58.6%) were breastfed for less than 6 months.

Serum IgE levels were low in children who received breast feeding for more than 6 months. This reveals the protective role of breast feeding in the development of asthma.

Duration of the Disease:

In our study number of children with duration of asthma were < 4 years were 49 (65.34%) and duration > 4 years were 26 (34.66%). Average IgE levels in children with duration of asthma less than 4 years was 520.8IU/ml and in children with duration more than 4 years it was 838.46 IU/ml. The severity was high in children who had symptoms for more than 4 years..

CONCLUSION

Atopy, passive smoking, family history and duration of breast feeding remains the major risk factors in childhood asthma.

There is strong correlation between atopy and severity of asthma.

Especially severity is more in children with atopic eczema.

Therefore early and effective management of Atopy could reduce the severity of asthma.

Children with persistent exposure to passive smoking and with positive family history have severe asthma. These children should take necessary precautions to avoid the triggering factors that may contribute to morbidity.

Exclusive and prolonged breast feeding plays a vital role in decreasing the severity of asthma.

Insisting and promoting exclusive breast feeding for a period of 6 months and continuing it for long periods along with supplementary feeds could significantly reduce the severity of asthma in children.

Longer the duration of Asthma, the severity is more. Identifying the disease earlier and avoidance of triggering factors can reduce the frequent exacerbations.

IgE has found to play a predominant role both in the prevalence and severity of asthma. Estimation of serum IgE levels and assessment of severity helps in effective management of asthmatic children.

Based, on this study, Anti-IgE therapy will be beneficial as disease modifying agent in moderate to severe asthmatics. But further studies are needed to prove its effectiveness in children.

There are numerous studies in Adults concerning asthma and serum IgE levels, but there are only very few studies in children. Our study will be valuable in the management of children with asthma and in reducing the morbidity and mortality.

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