

CHILDHOOD ASTHMA AND GROWTH

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Abstract

Background: Asthma is an Umbrella term, which involves reversible airway obstruction caused by different mechanisms. It's the most common chronic disease of childhood. The prevalence, morbidity and mortality of asthma have increased during last two decades without obvious specific causes. The hyper responsiveness manifest itself as bronchoconstriction following URTI, exercise, strong odor or irritant fumes, tobacco smoke, cold air, drugs...etc.

Does asthma affect growth of the patient? If it is any relation of that to severity of asthma?

Aim: To study growth parameters of asthmatics i.e weight, height and head circumference and to show any effect of asthma on growth and relation of that to severity of asthma.

Subjects & Methods: A total number of 110 asthmatic patients subjected to study of growth parameters (weight, height and head circumference) and put these measurements on centile chart with assessment of severity of asthma according to specific clinical criteria and study

of growth failure in relation to severity of asthma had been done.

Results: The results show that 16.28% of mild asthmatic patients have weight on 10th centile while 44.18% on 50th centile and 39.5% on 90th centile. In moderate asthma 12.24% of patients on 10th centile for weight, 67.34% of patients on the 50th centile and 20.4% about 90th centile.

In severe asthmatics 50% were on 10th centile and 38.8% on 50th centile and 11.11% about 90th centile. By statistical analysis by chi square there is decrease of weight of asthmatics with increase severity of asthma ($P < 0.05$) i.e there is a growth failure in asthma (mainly the weight) but no significant decrease in height and head circumference). The more severe the asthma the more negative correlation to growth.

Conclusion: Chronic asthma affects the growth of asthmatic patients especially in moderate to severe asthma.

Key words: asthma, growth, severity

Iraqi J Med Sci, 2004; Vol.3(2): 175-178

Introduction

Asthma defined as reversible airway obstruction due to hyper- reactivity of the airway¹. It's the most common chronic disease in childhood. Both small (<2mm) and large (>2mm) airways involved to varying degree in this hyper reactivity².

Asthma in fact an umbrella term which may brought about by different mechanisms, bronchoconstriction, mucosal edema and thick viscid secretion are three main pathological factors share together in narrowing of the airways³.

The hyper responsiveness manifest itself as airway obstruction following triggering factors which are URTI, exercise, strong odors or irritant fumes, tobacco smoke, cold air, drugs (e.g. NSAID) and other predisposing factors which differ from patient to another⁴.

The prevalence, morbidity and mortality of asthma have increased during the last two

decades, without specific causes, its responsible for significant proportion of school days lost because of chronic illness⁴.

Asthma is a complex disorder involving autonomic, immunologic, infectious, endocrine and psychological factors.

Does asthma affect growth of the patient? And if it's is there any relation to severity. This question to be discussed by this study.

Subjects & Methods

A cross sectional study done from August 2001 to August 2002 which a total number of 110 asthmatic patients subjected to study regarding growth parameters i.e weight, height and head circumference for each patient and put those on centile chart and compared them with 10th, 50th and 90th centiles.

Also these patients assessed clinically for severity of asthma according to following criteria:

Mild Asthma: patients with mild asthma have less frequency of attacks, good exercise tolerance, good school attendance, little or no interruption of sleep and good response to

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Received 17th February 2004; Accepted 21st June 2004.

treatment. They have normal chest- X ray and no hyper inflation of the chest and patient is symptoms free between the attacks.

Moderate asthma: Children of moderate asthma have more frequent attacks than the mild disease and often have cough and mild wheezing between more sever exacerbations, school attendance may be impaired, exercise tolerance is diminished and child may lose sleep at night during attack, such children will generally require continuous rather than intermittent bronchodilator therapy and sometimes steroid to control the symptoms. Hyperinflation may be evident clinically and roentgenographically.

Sever asthma: Children with sever asthma have daily wheezing and more frequent and more sever exacerbations and require recurrent hospitalization which is rarely required for mild or moderate asthma. They miss significant days of school, have their sleep interrupted by asthma and have poor exercise tolerance.

They have chest deformity as a result of chronic hyperinflation. Bronchodilator required continuously and steroid regularly. The correlation of the growth parameters with the severity of asthma analyzed by Chi square. For each asthmatic patient we compare the severity of asthma with the centile for weight, height and head circumference.

Results

The results showed that the weight of the patients (16.28%) which are labeled as mild asthma is about 10th centile and 19 patients (44.18%) are about 50th centile and 17 patients (39.5%) are about 90 centile (Table 1, Figure 1). While the patient's moderate asthma, 6 patients (12.24%) with weight about 10th centile and 33 patients (67.34%) their weight on 50th centile and 10 patients (20.4%), their weight on 90 centile (Table 1, Figure 1).

Table 1: Correlation of severity of asthma with weight centile

Percentile	Mild	Moderate	Severe
10 th	7 (16.28%)	6 (12.24%)	9 (50%)
50 th	19 (44.18%)	33 (67.34%)	7 (38.88%)
90 th	17 (39.5%)	10 (20.4%)	2 (11.11%)
Total	43	49	18

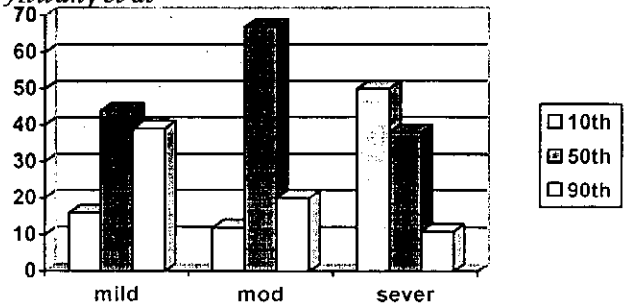


Figure 1: Weight centile in relation to severity of asthma

Regarding the patients with severe asthma, 9 patients (50%) were on the 10th centile for weight and 7 patients (38.88%) were on the 50th percentile and 2 patients (11.11%) about the 90th centile (Table 1, Figure 1).

The statistical analysis of these data by qui square showed that there is decrease of weight of the patient with the increase of severity of asthma (P < 0.05).

The results of the height of the mild asthmatic patients showed that 12 patients (29.9%) were about 10th centile, 18 patients (41.86%) were on the 50th centile and 13 patients (30.23%) on the 90th centile table 2 figure 2 while patients with moderate asthma, 8 of those (16.32%) were about 10th centile and 20 (40.8%) patients were on 50th and 21 (42.86%) were on 90th centile (Table 2, Figure 2).

Table 2: correlation of severity of asthma with height centile

Percentile	Mild	Moderate	Severe
10 th	12 (29.9%)	8 (16.32%)	5 (27.7%)
50 th	18 (41.86%)	20 (40.8%)	7 (38.88%)
90 th	13 (30.23%)	21 (42.86%)	6 (33.3%)
Total	43	49	18

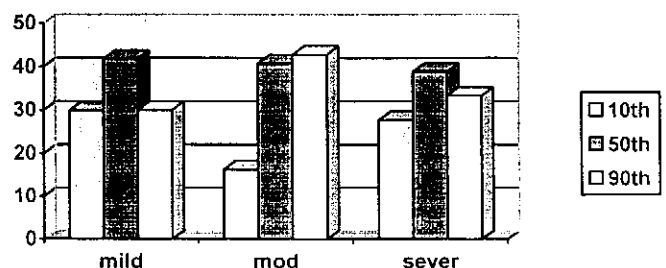


Figure 2: Height centile in relation to severity of asthma

The results of head circumference showed that 5 patients of mild asthma (11.6%) were on 10th and 22 (51.16%) patients were on 50th and 16 (37.2%) patients were on 90th centile (Table 3, Figure 3) while 5 patients of moderate asthma (10.2%) were about 10th and 22 (44.89%) patients were on 59th centile and 22 (44.89%) were on 90th centile (Table 3, Figure 3).

While 5 patients of sever asthma (27.7%) were on 10th centile and 6 patients (33.3%) were on 50th and 7 patients (38.8%) were on 90th centile (Table 3, Figure 3).

Table 3: Correlation of severity of asthma with head circumference centile

Percentile	Mild	Moderate	Severe
10 th	5 (11.6%)	5 (10.2%)	5 (27.7%)
50 th	22 (51.16%)	22 (44.89%)	6 (33.3%)
90 th	16 (37.2%)	22 (44.89%)	6 (38.8%)
Total	43	49	18

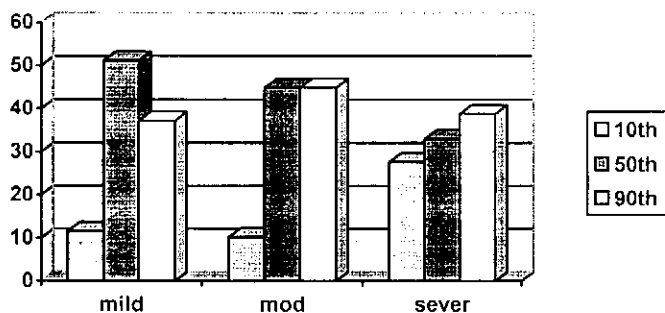


Figure3: Head circumference centile in relation to severity of asthma

By analysis of those data of height and head circumference by qui square, we found no significant decrease of height and head circumference with increase of severity of asthma in this sample of patients ($P > 0.05$).

Discussion

1. The results of the study showed growth failure (mainly weight) of the patient correlate with the severity of asthma, the more severe the asthma (i.e moderate to sever) the more failure to thrive.
2. The failure to gain weight in severe asthmatic goes with the fact that the weight is first to be affected in any chronic disease, followed by height then the head circumference.

3. The non-significant correlation of height and head circumference with the severity of asthma in this study may be due to short duration for the study and may need more longer follow up to manifest.

4. The growth failure in asthmatics has many causes, It may be due to disease itself or may be due to treatment (mainly steroid) and this is so difficult to estimate because usually those patients received steroid frequently.

Many studies worldwide discussed this issue: Abrom⁵ estimated that any chronic lung disease leads to growth failure and delayed development. Baum et al⁶ showed that asthma affect growth and the more sever the asthma the more negative growth. Kloditz⁷ showed that asthmatics have tendency to retard growth and hyposomia in childhood and also estimated that B2 agonist decrease growth hormone (GH) secretion. Sharek and Bergman⁸, Fernando et al. showed that inhaled steroid leads to decrease growth.

Kisson et al. showed that steroid affect growth of the asthmatic patients. Silver-stain et al.¹⁰ showed that adult height of asthmatics is not significantly different from peers. Patel et al. showed that growth impairment is temporary and reversible.

Conclusions

- * Chronic asthma affects growth of the patient mainly the moderate to sever type.
- * Mild asthmatic has the chance to grow as peers.
- * Height and head circumference is not significantly affected by asthma.

Causes of growth failure of asthma are difficult to be estimated because the variety of causes that affect growth of asthmatics which needs more specific sophisticated studies.

Recommendations

1. Measurements of growth parameters are important in asthmatic patients because it correlate with severity of asthma, so there measurements should be included in the follow up of asthmatics.
2. Good control of asthma in children may give good chance for better growth.
3. The steroids is still highly recommended in moderate to severe asthma regardless of possibility of growth suppression that is because of risk-benefit ratio of sever asthma which may

danger the life of the asthmatics and a lot of studies showed that the growth failure is reversible in asthma i.e normal adult growth may be catch up as his normal peers.

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