Clinical Diagnosis of Asthma in Children

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Abstract: Background: Asthma is the most common chronic respiratory disorder in childhood. Asthmatic attacks are described and classified according to the type of wheezing to Non-atopic and Atopic asthma (IgE mediated wheezing). Objective: The aim is to determine the onset of clinical diagnosis in relation to clinical presentation and of asthma in children in Jaafar Ibn-oaf and Ibrahim Malik teaching hospitals in Khartoum Capital of Sudan from May-July 2013. Materials and Methods: This was a descriptive cross-sectional hospital-based study. A 16-item self-administered questionnaire was distributed to 111 asthmatic patients at the largest two hospitals in Khartoum state. Participants were selected using convenience sampling method. Results: 111 questionnaires were analyzed. The common age of onset of symptoms is < 1 year 38.7%, > 2 years 38.7% and 1-2 years 22.5%.the common age of diagnosis is 1-2 years 30.6%, <1 year 28.8%, >3 years 26.1%, 2-3 years 14.4%.the common symptoms is cough 94.6%, SOB 94.6 %, wheezes 82 %, fever 61.3%, rhinorthe 47.7%, refuse feeding and or drinking 60.4%.The most common aggravating factors are allergen 71.2 %, ARI 60.4%, cold 39.6%, irritants 30.6%, exercise 15.3% and drugs 3.6%.And there is strong family history of asthma and other allergies. Conclusion: there is over-diagnosis of asthma due to the symptoms which mimic other respiratory infections. Common symptoms of asthma are cough, SOB and wheezes. And common aggravating factors are irritants and ARI.

Keywords: Asthma, Sudanese, bronchiolitis, children

1. Introduction

Asthma is the most common chronic respiratory disorder in childhood. Asthma is a disorder that causes the airways of the lungs to swell and narrow, leading to wheezing, shortness of breath, chest tightness, and coughing. Atopy is an inherited predisposition to sensitization to allergens, and is present in up to 40% of children, most of whom are asymptomatic. Atopic children are at increased risk of allergic disease. Diagnosis is usually made on a history of recurrent wheeze, with exacerbation usually precipitated by viral respiratory infection. Recording peak expiratory flow rate (PEFR) may be useful most children over 5 years of age can use a peak flow meter. Asthma results in increased variability in peak flow, both diurnal variability (morning PEFR usually lower than evening PEFR) and day-to-day variability. There may also be bronchodilator responsiveness, where PEFR will increase by more than 10-15% after inhaling a bronchodilator. Often response to treatment is the most helpful investigation.

In atopic asthma the lung function is normal at birth, but recurrent wheeze develops with allergic sensitization, with increased blood IgE and positive skin prick tests to common allergens. Atopic wheezers have persistence of symptoms and have decreased lung function later in childhood. Risk factors for the development of atopic wheeze (asthma) are family history of asthma or allergy and a history of eczema, while exposure to tobacco smoke or prematurity are not risk factors.

Diagnosing asthma in young children is difficult because children often cough and wheeze with colds and chest infections, but this is not necessarily asthma. Young children have very small, narrow airways and on average have a 6 –8 colds per year, usually between September and March. Some physicians are reluctant to give a diagnosis of asthma to young infants as other conditions can be responsible for the asthma like symptoms. Children and toddlers can wheeze when they have viral infections. Bronchiolitis is another very common cause of wheeze in children. First episodes of cough, runny nose and fever that happen in cold/flu season-fall/winter/early spring is likely not asthma. If your child has several more episodes of wheeze and cough, it is likely to be asthma. The common cold triggers 90% of asthma attacks in children, compared to 40% in adults. Since there is no
diagnostic test available for children younger than 6 years of age, making a diagnosis in this age group is more difficult than in older children. Over the age of about 6 years it is possible for a child to have a spirometer test. This is a simple test that measures a child's airflow through the large and small airways. Results reveal if the child's airflow can be improved with medication. Reversibility of airway obstruction is a key feature of asthma. If administering a bronchodilator reverses airway narrowing significantly, the diagnosis is probably asthma.

In Previous Study was done where 958 asthmatic children the median age of onset of asthmatic symptoms was 3.0 years old (2.0-4.0 IQR), with the peak between 1 to 3. And The diagnosis may be based on the subject's self-reporting of symptoms or by stringent clinical criteria as used by Yunginger. Morgan's study, showed that 79% of children with persistent asthma at 16 years old had their onset of asthma before pre-school age, with asthma had symptoms before 6 year of age. In contrast to Yunginger's which showed that the median age of onset of asthma was 3 year for males and 8 year for female children.

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Data management and analysis: Data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) V.19.0

3. Ethical Approval

Ethical approval was taken from the hospitals. Participants in this study were all briefed about the purpose of the study and their verbal consent was taken. Privacy and confidentiality have been assured.

4. Results

A total of 120 asthmatic patients participated in the study. Of these, 5 were excluded because they did not meet the inclusion criteria and 4 were excluded because they did not provide answers. Thus, the final analysis was based on the data collected from 111 asthmatic patients.

Age and gender distribution of the study population

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>67</td>
<td>60.4%</td>
</tr>
<tr>
<td>Female</td>
<td>44</td>
<td>39.6%</td>
</tr>
</tbody>
</table>

More males (60.4%) than females (39.6%) employed at the two hospitals participated in this study.

Common age presented to hospitals under-study is 1-5 years 59%.
The age of onset of symptoms was categorized into <1 year 38.7 % (n=43), 1-2 years 22.5 % (n=25) and >2 years 38.7 % (n=43).

Figure 2: Mother’s level of education.

Figure 3: Age of onset of symptoms

Figure 4: Relationship between mother level of education and age of onset of symptoms.
The common age of diagnosis of asthma is categorized into <1 year 28.8%(n=32), 1-2 years 30.6%(n=34), 2-3 years 14.4%(n=16) and >3 years 26.1%(n=29).

**Table 2** showing the Frequency of admission prior to final diagnosis

<table>
<thead>
<tr>
<th>Frequency of admission prior to diagnosis</th>
<th>Total</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std.Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>053</td>
<td>111</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>2.98</td>
<td>2.438</td>
</tr>
</tbody>
</table>

**Figure 7:** Relationship between age of onset of symptoms and age of diagnosis
Common symptoms of asthma in children

Table 3: Showing common symptoms of asthma in children.

<table>
<thead>
<tr>
<th>Common symptoms</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>105</td>
<td>94.6%</td>
</tr>
<tr>
<td>Wheezes</td>
<td>91</td>
<td>82%</td>
</tr>
<tr>
<td>Fever</td>
<td>68</td>
<td>61.3%</td>
</tr>
<tr>
<td>SOB</td>
<td>105</td>
<td>94.6%</td>
</tr>
<tr>
<td>Rhinorrhea</td>
<td>53</td>
<td>47.7%</td>
</tr>
<tr>
<td>Refuse feeding and or drinking</td>
<td>67</td>
<td>60.4%</td>
</tr>
</tbody>
</table>

Common aggravating factors

Table 4: Showing common aggravating factors.

<table>
<thead>
<tr>
<th>Common aggravating factors</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARI</td>
<td>67</td>
<td>60.4%</td>
</tr>
<tr>
<td>Cold air</td>
<td>44</td>
<td>39.6%</td>
</tr>
<tr>
<td>Exercise</td>
<td>17</td>
<td>15.3%</td>
</tr>
<tr>
<td>Drugs</td>
<td>4</td>
<td>3.6%</td>
</tr>
<tr>
<td>Irritants</td>
<td>34</td>
<td>30.6%</td>
</tr>
<tr>
<td>Allergen</td>
<td>79</td>
<td>71.2%</td>
</tr>
</tbody>
</table>

Personal and family history of atopy and other allergies

Figure 10 showing personal history of atopy.

64% with no history of personal atopy.

Figure 11 showing family history of asthma and other allergies.

73% asthmatic patients have family history of asthma and other allergies.

5. Discussion

Results of hospitals understudy is 59.5% presented at age 1-5 years this is suggesting the hypothesis of over-diagnosis as all this patient are not confirmed as asthmatic patients and diagnosed only clinically, in contrast to 22.5% presented at age 6-9 years and 18% presented at age 10-16 years which suggest also younger children has more asthmatic attacks that bring them to hospitals. According to previous researches(1) hypersensitivity is more in male and our study suggesting this hypothesis. Male to female ratio is 67:44. Among mothers primary education has highest percentage 25.2% ,secondary education 23.4% graduate 22.5% . And when compare mother level of education in relation to age of onset of symptoms we found that among children less than 1 year the age of onset of symptoms is inversely proportional with mother level of education as level of education increase the number of onset of symptoms decreases and vice versa we can explain this by ignorance of low level of education to caring which is most probably due to hypersensitivity rather than asthma. Contrary children with onset of symptoms more than two years is directly proportional with mother level of education explained by older aged are getting towards confirmation of asthma, as the child is more exposed to the risk factors by himself rather than by his mother. Thus we can conclude there is no relation between onsets of symptoms in older age with mother’s level of education. Our study show that 39% presented at < 1 year, 22% presented at 1-2 years and 39% presented at > 2 years. In contrast to (Study was done where 958 asthmatic children who fulfilled the inclusion criteria are, but 16 of them were
6. Conclusion

- The common age of onset of symptoms is <1 years and > 2 years.
- The common age of diagnosis is 1-2 years.
- There is over-diagnosis of asthma in children under 2 years.
- The common symptoms are cough, SOB and wheezes.
- The common aggravating factors are irritants and ARI.
- High family history of asthma and other allergies suggest strong genetic association.

7. Acknowledgment

The authors would like to thank all who volunteered to participate in the study.

8. Conflicts of interest

There are no conflicts of interest

References


[15] Kramer MS, Kakuma R. Maternal dietary antigen avoidance during pregnancy or lactation, or both.

