Improving access and quality of Asthma care in Kenya: the promise of the new Kenya National Asthma Guidelines

Chakaya J.M.
Outline

• Burden of Disease
• Basic Pathophysiology
• Diagnosis
• Treatment
• Service Organization: the Practical Approach to Lung
• Monitoring and Evaluation
Disease Burden
Epidemiologic Studies

• **International Study of Asthma and Allergic Disease in Childhood**

  o 1995: Wheeze in the last 12 months among 13-14 year old
    • Nairobi 17.1%; Eldoret 10.4%

  o 2000: Wheeze in the last 12 months among 13-13 year
    • Nairobi 18%; Eldoret 13%

• Ait-Khaled N, Odhiambo J, Pearce N. Allergy. 2007 Mar;62(3):247-58
But.............

• No population based studies on children under 10 and adults over 14

• No data on burden of asthma routinely managed in regular health services

• Quality of care and treatment outcomes also unknown
Asthma: A multi factorial disease

- **Non Modifiable Factors**
  - Gender: early M>F; Later F>M
  - Atopy
  - AHR

- **Modifiable Factors**
  - Allergen Exposure
  - Infections and Infestations
  - Breastfeeding
  - Air pollution
  - HIV infection
  - Occupational Exposures
  - Tobacco smoking including environmental tobacco smoke (passive smoking)
Asthma pathophysiology

Smooth muscle dysfunction
- Bronchoconstriction
- Bronchial hyper-reactivity
- Hyperplasia
- Inflammatory mediator release

Airway inflammation
- Inflammatory cell infiltration/activation
- Mucosal oedema
- Cellular proliferation
- Epithelial damage
- Basement membrane thickening

Symptoms \ exacerbations
The Asthma Paradigm

**Participating Cells**
- Airway Epithelial Cells
- Antigen Presenting Cells
- T – Lymphocytes
- Eosinophils
- Mast Cells
- Airway smooth muscles
- Endothelium
- Fibroblasts and Myofibroblast

**Mediator Soup**
- Chemokines
- Cytokines
- Cystenyl Leukotrienes
- Nitric Oxide
- Prostaglanding D2
- Others

**Effects**
- Broncho-constriction
- Vascular leakage
- Increased airway secretions
- Airway Hyper responsiveness
Asthma Diagnosis
Diagnostic Step 1

• Listen to the patient
  • Is there recurrent or episodic wheeze, cough, chest tightness or shortness of breath?
  • Are the symptoms particularly troublesome at night or early morning?
  • Are the symptoms triggered by factors such as dust, cold exposure, strong smells or exercise?
  • Is there a consistent response to asthma specific treatment?
Diagnostic Step 2

• Obtain a lung function Test (measure FVC, FEV1 and PEF)
  • Is there airflow limitation (FEV1/FVC% less than 70?)
  • Is there a bronchodilator response (FEV1 or PEF improved by greater that 12% or 15%, 30 minutes after inhalation of a short acting bronchodilator)?
  • Measure PEF variability ( wide swings in the PEF between morning and evening or when at work and off work)
Diagnosis Step 3

• Measure airway hyperresponsiveness.

  o Does the FEV1 drop below 20% with only small doses of an inhaled bronchoconstrictor such as methacholine, histamine or with exercise?
Consider Asthma Mimics

- Hyperventilation syndrome and panic attacks
- Upper airways obstruction and inhaled foreign bodies
- Vocal cord dysfunction
- Other forms of airways obstruction especially Chronic Obstructive Pulmonary Disease (COPD)
- Non pulmonary causes of symptoms especially left ventricular failure
- Non obstructive forms of lung disease such as diffuse parenchymal lung disease
## Lung Function Testing in Kenya: the aspiration

<table>
<thead>
<tr>
<th>Level</th>
<th>Facility</th>
<th>Available Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Community Units</td>
<td>Awareness/Referrals</td>
</tr>
<tr>
<td>2</td>
<td>Dispensary</td>
<td>Peak Expiratory Flow</td>
</tr>
<tr>
<td>3</td>
<td>Health Centre</td>
<td>PEF and Basic Spirometry</td>
</tr>
<tr>
<td>4</td>
<td>Sub and District Hospital</td>
<td>PEF, Spirometry, airway resistance and airway hyperresponsiveness</td>
</tr>
<tr>
<td>5</td>
<td>Regional Hospitals</td>
<td>Above plus lung volumes and capacities, gas transfer</td>
</tr>
<tr>
<td>6</td>
<td>Referral Hospitals</td>
<td>Above plus complex imaging and invasive tests</td>
</tr>
</tbody>
</table>
Treatment of Asthma
Figure 4.3-2.

Management Approach Based On Control
For Children Older Than 5 Years, Adolescents and Adults

<table>
<thead>
<tr>
<th>Level of Control</th>
<th>Treatment Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled</td>
<td>Maintain and find lowest controlling step</td>
</tr>
<tr>
<td>Partly controlled</td>
<td>Consider stepping up to gain control</td>
</tr>
<tr>
<td>Uncontrolled</td>
<td>Step up until controlled</td>
</tr>
<tr>
<td>Exacerbation</td>
<td>Treat as exacerbation</td>
</tr>
</tbody>
</table>

Treatment Steps

Step 1
Asthma education
Environmental control

As needed rapid-acting $\beta_2$-agonist

<table>
<thead>
<tr>
<th>Controller options ***</th>
<th>As needed rapid-acting $\beta_2$-agonist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select one</td>
</tr>
<tr>
<td>Low-dose inhaled ICS*</td>
<td></td>
</tr>
<tr>
<td>Leukotriene modifier **</td>
<td></td>
</tr>
<tr>
<td>Low-dose ICS plus leukotriene modifier</td>
<td></td>
</tr>
<tr>
<td>Low-dose ICS plus sustained release theophylline</td>
<td></td>
</tr>
</tbody>
</table>

*ICS: Inhaled Corticosteroids
**Leukotriene modifiers include leukotriene receptor antagonists such as montelukast or zafirlukast.
***Controller options include medications that control asthma symptoms, such as inhaled corticosteroids, long-acting $\beta_2$-agonists, leukotriene modifiers, and other controller medications.
Organization of Care
The Practical Approach to Lung Health

- Goal – improve quality of care and outcomes of patients presenting with respiratory symptoms at the primary health care setting

- Based on syndromic management

- Anchored on Standardization of Care

- Focuses on recognition and management of serious acute respiratory infections (pneumonia) and chronic lung disease (TB, Asthma and COPD)
Conclusion

• Asthma
  • A common disease but burden of disease poorly characterized in Kenya
  • Common sense approaches can diagnose and treat to control, most cases of asthma
  • Approaches such as PAL may improve recognition, treatment and outcomes of patients with asthma