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Asthma

Executive summary

Introduction

Asthma is a very common, long-term, inflammatory disease of the airways of the lungs, characterized by variable and recurring symptoms, inflammation, reversible airflow obstruction, and bronchospasm. Symptoms include episodes of wheezing, coughing, chest tightness, and shortness of breath. These episodes may occur a few times a day or a few times per week. Depending on the person, they may become worse at night or with exercise.

It is thought to be caused by a combination of genetic and environmental factors (e.g. exposure to air pollution and allergens). Other potential triggers include medications such as aspirin and beta blockers. Diagnosis is usually based on the pattern of symptoms, response to therapy over time, and spirometry or peak flow

There is no cure for asthma. Symptoms can be prevented by avoiding triggers, such as allergens and irritants, and by the use of inhaled corticosteroids.

Target users

- Doctors
- Nurses

Target area of use

- Gate clinic
- Outpatients
- Ward

Key areas of focus / New additions / Changes

This guideline addresses the management of both acute and chronic asthma. It gives guidance on the immediate management of the acutely ill patient in gate clinic and the ongoing management of such patients on the ward.

It provides an asthma management plan to encourage literate patients to self-manage their asthma.

It advocates the use of inhalers rather than oral medications – given the increased effectiveness and reduced side-effects associated with this treatment.

Limitations

There is no access to arterial blood gases or to intubation for severely ill patients with asthma.

Presenting symptoms and signs

	Life threatening	Acute severe	Moderately exacerbated	Mild
Dyspnoea	At rest	At rest	When talking	With activity
Speech	Mute	Difficult	Difficulty completing sentences	Can complete sentences
Body position	Unable to recline	Unable to recline, restless	Sitting up	Able to recline
Respiratory rate	>30 /min – feeble effort	Often > 25 /min	Increased	
Use of accessory muscles	Paradoxical thoraco-abdominal movements	Increased use	Yes	
Breath sounds	Near silent or silent chest	Loud inspiratory and expiratory wheeze	Loud expiratory wheeze	Moderate wheeze at mid to end expiration
Heart rate	Relative bradycardia < 50/min	Tachycardia > 110 /minute	> 100 /min	< 100 /min
Blood pressure	Hypotension	Normotensive in most cases	Normotensive	Normotensive
Mental status	Confused or drowsy			
PEFR (% of predicted)	< 33%	33-50%	50-80%	> 80%
Oxygen saturation	< 92%	≥ 92%	> 95%	> 95%
ECG	Arrhythmia			

Brittle asthma

Defined by either:

- Wide peak flow variability (> 40% diurnal variation for more than 50% of the time over a period of > 150 days) despite intense therapy
- Sudden severe attacks on a background of apparently well-controlled asthma

Investigations of acute severe asthma

Peak flow – when expressed as a percentage of the patient's previous best value is most useful clinically

Pulse Oximetry – measurement of oxygen saturation with a pulse oximeter is necessary to determine the adequacy of oxygen therapy

Chest x-ray – recommended in patients with:

- Suspected pneumomediastinum or pneumothorax
- Suspected consolidation
- Life-threatening asthma
- Failure to respond to treatment satisfactorily
- Requirement for ventilation.

Arterial blood gases are desirable but not currently available.

Management in Gate Clinic

Anyone with saturations below 92%, very little air entry, poor respiratory effort, reduced conscious level, reduced blood pressure, arrhythmia has life-threatening asthma and ***the doctor should be called to see them immediately.***

Look out for common symptoms and signs of asthma: cough, difficulty with breathing, dyspnea, difficulty speaking in full sentences, sitting up/unable to recline.

Once you suspect asthma, examine for auscultatory wheeze (if life threatening, chest may be silent).

Nebulize immediately if there is anything other than mild asthma with Salbutamol 2.5 mg in children, 5 mg in adults, double diluted with water for injection. Nebulization can be done back to back till the patient feels relief.

Give a course of steroids to all patients with a clear diagnosis of asthma, who do not have signs of severe asthma and who improve after nebulization. Give prednisolone 40 mg OD for 5 days to adults and 2 mg/kg (max 40 mg) OD for 3 days to children.

Also give these patients a salbutamol inhaler with a spacer. Ensure that the patient and their family understand when to use the inhaler and how to use it. Advise them to use the inhaler whenever they are short of breath. Explain that they should always use the spacer to ensure the full dose of medication reaches their lungs and that they do not suffer side effects. If they need to use it more than 3 times in a day, then they should seek medical help. Also advise them to take 10 puffs of the inhaler via the spacer if they become acutely breathless. They should then seek medical help.

Refer to the doctor if:

- you are unsure of the diagnosis
- there is any of fever, weight loss, general body pain, failure to thrive, any unexplained clinical findings, vomiting or chronic productive cough.
- the patient has not improved after nebulization.

Management in OPD

Look out for common symptoms and signs of asthma: cough, difficulty with breathing, dyspnea, difficulty speaking in full sentences, sitting up/unable to recline.

Once you suspect asthma, do a quick assessment: including a quick general examination and a quick respiratory exam (including pulse oximetry).

Send for nebulization and/or admission as necessary. If stable after nebulization, consider managing as outpatient with short follow-up period.

Stable asthma management

For patients with stable asthma use the asthma action plan to help them manage their asthma in the long run.

Give these patients a salbutamol inhaler with a spacer. Ensure that the patient and their family understand when to use the inhaler and how to use it. Advise them to use the inhaler whenever they are short of breath. Explain that they should always use the spacer to ensure the full dose of medication reaches their lungs and that they do not

suffer side effects. If they need to use it more than 3 times in a day, then they should seek medical help. Also advise them to take 10 puffs of the inhaler via the spacer if they become acutely breathless. They should then seek medical help.

Management on the ward

Admit the patient if:

- Respiratory fatigue and suspected airway infection
- Presence of pneumothorax
- Hypotensive
- History of status epilepticus
- Persisting or worsening hypoxia
- Drowsiness and confusion
- Exhaustion, feeble respiratory effort
- ECG abnormalities (supraventricular arrhythmias, multifocal atria tachycardia, conduction disturbances, ventricular ectopics).

Move to acute care room or emergency bed and give continuous humidified oxygen.

- Every 15 minutes monitor pulse oximetry and vital signs electronically.
- Rehydrate if dehydrated or hypotensive using 0.9% Normal Saline at maintenance level.
- Nebulise with Salbutamol (5 mg in 5 mls of Normal saline or 2.5 mg for children).
- IV Hydrocortisone 200 mg 6 hourly or Oral Prednisolone 30-50 mg PO.

Consider giving a single dose of IV Magnesium Sulphate (1.2-2 g IV MgSO₄ in 100ml 0.9% saline over 20 minutes) for patients with acute severe asthma that have not had a good initial *response to inhaled bronchodilator therapy or have life threatening or near fatal asthma.*

Subcutaneous adrenaline (1: 10,000 solution) 0.1 – 0.3 ml in the young and 1 ml in the adult can be used for those that do not respond despite all the measures above.

Remember to exclude anaphylaxis and tension pneumothorax.

Intravenous aminophylline

In acute asthma, the use of aminophylline is not likely to result in any additional bronchodilation compared to standard immediate treatment with nebulised β_2 -agonist bronchodilators and oral steroids. Some patients with near fatal asthma or life threatening asthma with a poor response to initial therapy may gain additional benefit from iv aminophylline.




Give a single iv dose of aminophylline 5 mg/kg over 30 minutes only if the patient has not received oral theophylline or aminophylline within the last 24 hours.

Add 500 mg aminophylline (20 ml volume to 500 ml 0.9% saline after removing 20 ml from the bag of saline (concentration: 500 mg in 500ml = 1 mg/ml). Run the infusion for 30 minutes.

Do not use a maintenance infusion unless it is absolutely necessary as we cannot measure aminophylline levels.

Consider intubation if in **impending respiratory failure** – no sedation to be given

ASTHMA ACTION PLAN

Name:	My Asthma Severity:
 <p style="text-align: center;">GO</p> <p>I feel good No cough or wheeze I can work, sleep & play without symptoms</p> <p>My peak flow number is above _____</p>	<p>Green Zone : Asthma in good Control</p> <ol style="list-style-type: none"> 1. Take your asthma preventer inhaler everyday: Seretide/ Beclomethasone inhaler 2 puffs twice a day (gargle with warm water after) 2. Avoid your triggers as much as possible 3. If you are about to do something really physically demanding, use Salbutamol inhaler 2 puffs 15 minutes before starting and 2 puffs during the activity if you have symptoms.
 <p style="text-align: center;">SLOW</p> <p>I have any one of these:</p> <ul style="list-style-type: none"> • I do not feel good • Cough or wheeze • Chest feels tight • Waking up at night • Difficulty working, playing or sleeping <p>My peak flow number is between _____ and _____</p>	<p>Yellow Zone: Asthma is getting worse</p> <ol style="list-style-type: none"> 1. Keep taking your green zone inhalers. 2. Start your reliever/rescue inhaler Salbutamol Inhaler 2 puffs every 20 minutes for up to one hour. Then every 4 hours for 24-48 hours. 3. If you do not return to the green zone in 12 hours, or you get worse, start taking Prednisolone 40 mg once daily for 5 days. 4. If you stay in yellow zone for more than 12 hours, go to the clinic ASAP.
 <p style="text-align: center;">STOP</p> <p>I have any one of the following:</p> <ul style="list-style-type: none"> • Very short of breath. Cannot sleep, walk, work, talk or play • Severe wheezing, coughing hard • Chest tightness • Blueness of skin of lips, tiredness due to effort of breathing <p>My peak flow number is less than _____</p>	<p>Red Zone-Medical Alert- Get Help FAST!!</p> <ol style="list-style-type: none"> 1. Take reliever immediately or get nebulised every 10-15 minutes. 2. Get to health facility FAST.

References

Asthma: diagnosis, monitoring and chronic asthma management, NICE NG80, November 2017.
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