UNIT NO. 2

ACUTE SEVERE ASTHMA

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Acute severe asthma is a medical emergency, yet it is an eminently treatable and preventable disease. Early detection, effective treatment and long-term prevention of subsequent acute attacks are the key steps in management of acute asthma.

What is acute severe asthma?

Assume that any asthmatic patient who turns up unscheduled at your clinic with symptoms and signs consistent with acute airways obstruction (i.e. wheeze, cough, chest tightness) which you think must be relieved immediately (usually with nebulized bronchodilator drugs) has acute severe asthma. When patients turn up for acute care, their asthma symptoms have obviously escalated beyond the usual levels. This is a clear indication that the disease is out of control. Furthermore, in the vast majority of cases, quick reliever self-medication that has been administered failed to provide the usual symptomatic respite. This is thus a dangerous situation since (1) the disease has acutely exacerbated, (2) first line medication has failed and (3) the patient is concerned enough to come up for rescue therapy.

All asthma deaths are preceded by symptomatic exacerbations, so failure to detect life-threatening diseases and the failure to give prompt and effective treatment puts patients at risk of death. Many studies have shown that, during an acute asthma attack, clinical signs and symptoms are not reliable indicators of severity which is best measured by pulmonary function testing (i.e FEV1) or in the more severe cases, arterial blood gas analysis. The peak expiratory flow rate (PEFR) measured by a portable device is a useful test. But accurate PEFR evaluation need to be expressed as percent predicted and thus, corrected for age, height and sex (or previous know best PEFR during disease remission) and marked off from a normogram. Thus, for practical purposes it is best to manage ALL acute exacerbations as if they were potentially life-threatening episodes.

How should I treat it?

With bronchodilator drugs to quickly relief the severe airways obstruction (Table 1), the most effective treatment is short acting beta agonists by inhalation. The usual treatment in Singapore is 5 mg salbutamol in saline solution delivered via a hand held nebulizer and *repeated* 2-4 times. This regimen will control acute asthma symptoms in about 2/3 of cases. Randomized studies have shown that adding *repeated* doses of an anti-cholinergic agent (e.g 5 mcg ipratropium bromide) to this regimen will improve pulmonary function faster in more severe asthma and also reduce the need for hospital admissions by 30% to 60% and number of patients needed to treat to prevent one admission is 5 to 11. Thus, we also advocate the use of *repeat* nebulizations of ***a combination of salbutamol with ipratropium bromide*** for all patients except the most trivial cases of acute asthma.[4-7]

A *course of oral corticosteroids* will speed up the resolution of airway inflammation and prevent short-term relapse (Table 1).[7] It should be administered immediately and prescribed to ALL patients with an acute asthma exacerbation.[4] A recent case controlled study from Australia concluded for that oral steroids given for acute attacks will reduce the risk of death by 90%.[9] We recommend oral prednisolone of 30-40mg per day (at ~ 4 PM) for 7 to 10 days *with no "tail"*.[4]

A short "burst" of oral prednisolone which is *stopped promptly* is associated with almost no side effects and need not be "covered" with any antibiotics nor anti-ulcer prophylaxis. There is no evidence of increased risk of neither infections nor gastric problems in this setting. The only concern is poor sugar control among diabetics.

Theophyllines do not provide any additional bronchodilator effect on top of the above mentioned treatment in acute severe asthma[10, 11]. Thus, patients who are already taking theophyllines should be allowed to continue, but no additional doses are recommended. Similarly, mucolytic agents and anti-histamines do not help the resolution of acute asthma.

Table 1

Acute Asthma

Recommended treatment

1. Inhaled combination of short acting beta-2 agonist plus anti-cholinergic
   e.g. salbutamol 5 mg plus ipratropium 0.5mg
   To be repeated 2-4 x
2. Oral prednisolone 30-40mg per day for 7-10 days **and stop**
3. Subcutaneous adrenaline 0.5 ml (1:1000) 2-3 x in status asthmaticus
4. Long-term preventive treatment with **inhaled steroids** in persistent asthma*

Not recommended treatment

1. Anti-histamines
2. Antibiotics
3. Mucolytics
4. Increasing dose of oral theophyllines
5. Home nebulization

* Persistent Asthma (see check list & Asthma Steps in MOH CPG 01/2002). Need to use quick reliever MDI L 1 x per week daytime or L 1x per 2 weeks night time

Long term daily inhaled corticosteroids are indicated for these patients

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When do I have to refer?

Patients who appear critically ill and in near exhaustion from respiratory distress have *near fatal asthma* and should not be treated primarily in the clinic but should be transferred to the emergency department immediately.

Patients who do not respond promptly to or deteriorate despite the first line treatment described above have *status asthmaticus* and should also be referred to the hospital.

While waiting for the ambulance, patients with near fatal asthma and status asthmaticus should be treated with nebulized combination bronchodilator drug therapy plus oral prednisolone as described above. In addition, a parental administration of beta-adrenergic medication may be warranted in these patients with critically airflow obstruction who may not be able to inhale the aerosolized medication adequately. Repeat doses of subcutaneous adrenaline (0.5 ml of 1: 1,000) may be considered in this setting at 15-20 minute intervals. Supplementary oxygen should also be indicated.[3]

If the PEFR after treatment is to be used as criteria, most guidelines recommend a PEFR level of 70% -80% of predicted or personal best before it is safe to discharge patients from the clinic. [3]

Patients with *high risk asthma* should also be seen by a specialist even though they appear to respond to intensive treatment for acute asthma in the clinic.

What is high risk asthma?

These are patients who are likely to get acute severe asthma attacks in the near future and are in danger of dying from these episodes (Table 2). Studies of asthma deaths have consistently pointed to prior acute asthma exacerbations, inadequate preventive treatment and poor perception of asthma severity by both patients and their doctors as major remediable risk factors for asthma death. The majority of asthma deaths can be prevented if only the patients are managed appropriately.

Table 2

High Risk Asthma: referral to a specialist should be considered

Current asthma severity
Active symptoms which need quick relief with MDIs
1. O 1 unit of short acting -agonists MDI per month
2. Symptomatic despite L 1000 mcg of inhaled steroids per day
3. Unable to discontinue oral prednisolone at ANY dose

Poor asthma control
1. O 2 oral steroid bursts for acute asthma per year
2. O 2 clinic nebulizations per year
3. O 2 emergency visits per year
4. O 2 hospitalization per year

Near Fatal Asthma
1. Loss of consciousness during an attack
2. Previous tracheal intubations
3. Previous ICU admissions

The 2 clear indicators of risk are (a) severe current asthma symptoms and (b) poor asthma control. Severe current asthma leads to excessive use of quick relief rescue medication, usually in the form of short acting beta-agonists drugs via metered dose inhalers (MDI). Patients who have persistent asthma symptoms despite taking inhaled or oral steroids are especially at high risk. Poor asthma control results in repeated and unscheduled visits for acute asthma exacerbations even though patients may be apparently well in between attacks.

Patients with a history of near fatal asthma are always considered high risk and should be managed very cautiously. Near fatal asthma may be defined as a history of syncope during a prior asthma attack, previous intubations or ICU admissions for asthma.

Role of home nebulization for acute asthma

There is no role for unsupervised nebulization with bronchodilator drugs at home in the acute treatment of asthma. This form of treatment will result in over reliance on quick relief drugs and give patients a false sense of security. It is a potentially risky strategy that has been associated previously with asthma deaths. We discourage its use.

Preventing the next acute attack

The best risk factor for an acute severe asthma attack is the history of a previous attack. Thus, an acute asthma attack presents the doctor with an opportunity to initiate preventive treatment of future attacks. A short burst of oral prednisolone, as recommended above, is the most cost-effective way of preventing short-term relapse. A meta-analysis have shown that this will reduce the risk of asthma relapse from 15%-20% to 5%-10%.[8] However, the benefit (and risk of adverse effects) of oral steroids in asthma prevention disappear once they have been discontinued. Thus, for the majority of patients, long-term prevention therapy needs to be instituted at the same time as the oral steroids. Furthermore, recent research has shown that it is during the recovery period from an acute attack that patients are most receptive to education on better asthma prevention.

Learning Points:

- Assume ALL asthmatic patients who turn up unscheduled at your clinic with exacerbation of asthma as acute severe asthma
- The most effective treatment for acute severe asthma is short acting beta2 agonist by inhalation.
- There is no place of home nebulisation for acute asthma
- Administer a course of oral corticosteroids to ALL patients with an acute asthma.

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