LEADING ARTICLE

SEVERE ASTHMA

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THE DISEASE

Disease definition of asthma has for long relied on the clinical observation of episodic variable airflow limitation with improvement spontaneously or following appropriate therapy.

Recently, some authors proposed that the presence of airway hyper-responsiveness should be included in the definition of asthma as it was unlikely that asthma was present if bronchial hyper-reactivity was not. The reverse, however, is not so in that bronchial hyper-reactivity does exist in conditions other than asthma, as the hyper-reactivity is partly a consequence of inflammation (1).

Severity of asthma is usually graded on the frequency of attacks and the percentage falls in the peak flow readings or Forced Expiratory Volume in one second measurements (FEV_1). Turner-Warwick also observed the "brittle" pattern where marked, rapid swings in the airway obstruction put such patients at increased risk of dying (2).

The best management of status asthmaticus is its prevention. The proper management of asthma in remission should prevent its deterioration to status asthmaticus. Patient compliance to therapy and patient education about asthma are essential prerequisites in the battle to keep the patient symptom-free. All said and done, there is still a small group who are at high risk of going into status asthmaticus.

Status Asthmaticus

In this issue of the Journal, the intensive care management of such patients is reported. There is the expertise to properly reverse the acute bronchospasm, maintain assisted ventilation and treat the complications of asthma. However, despite all this, there is mortality. Two of the 18 patients with status asthmaticus died and both died from hypoxic brain damage following severe acute airways obstruction and respiratory arrest. Patients with asthma should be educated to realise when their illness is of such severity that immediate hospitalisation is necessary. The lack of symptoms related to airflow obstruction does not mean mild asthma.

Patient Education

Asthmatic patients and their relatives should be educated regarding certain features. First, the illness can deteriorate very rapidly and this is exemplified in the brittle asthmatics who, seemingly well in the day, are gasping for breath in the dead of the night. Such patients should self-monitor the peak flows at home and take action once the readings show a downward trend. It may be too late to await the onset of symptoms. Second, the patient should have a regular doctor who knows how "brittle" his asthma is. Good peak flow measurements fall outside the usual criteria used by Accident & Emergency Departments for admission but a "brittle" asthmatic cannot afford the luxury of waiting till the readings are a little lower. And his doctor should know this also. Third, the use of glucocorticoids is not to be feared or abhorred. Being aware of the potential adverse effects should allow its judicious use and it can be life-saving in asthmatics if started early and in large doses. The adverse and feared ill- effects are the result more often of prolonged duration of use at high doses. Short courses of "pulse" oral steroids are more beneficial than harmful (3). Fourth, bronchodilators remain symptomatic therapy for asthma. In as much as the disease causes bronchoconstriction and airflow limitation and air trapping, bronchodilators do the reverse. Increasing use of bronchodilators by the patient in the face of deteriorating asthma (as objectively measured by peak flows) means that symptomatic therapy alone is insufficient and its continued use is dangerous. The false sense of security that since bronchodilators are used, the patient is receiving treatment and can wait, often results in hypoxic brain damage following respiratory arrest.

Chronic Asthma

Another point brought out in the article is the group with "irreversible" and hence chronic airway obstruction. A re-look at the definition of asthma emphasizes the "reversibility" of the airway obstruction, defined in the respiratory function laboratory as bronchodilation of 15% or more in FEV_1 from the baseline reading. There is no mention about the FEV_1 ever returning to its normal predicted value for that patient. In the absence of permanent lung damage from any cause, the asthmatic should sometime in the future return his FEV_1 to normal values. Today, it is increasingly recognised that some patients do not show this despite long periods of follow-up. They tend to be older women. Two possible explanations for this are: one, it is not easy to find older men who are not cigarette smokers and therefore who have some degree of chronic obstructive lung disease which is by definition, not "reversible"; and two, it takes time for asthma to become chronic and "irreversible".

The proposal is that chronic asthma and the "irreversible" component (increasing inability of the FEV_1 for example, to normalise) is the long-term sequel of airway inflammation. The latter, over time, if not treated or inadequately treated, will lead to fibrotic changes and structural narrowing of airways. Easy reversibility of airways is a function of muscle relaxation (rapid) and resolution of acute inflammation in the airways (slower) with oedema and inflammatory cells slowly dissipating. Once there is some fibrosis it is not difficult to understand why the flow readings cannot normalise.

CONCLUSION

The definition of asthma today should include the newer

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concepts of bronchial hyper-reactivity and airway inflammation. Not to address these two pathophysiological mechanisms is to undertreat some asthmatics perhaps with serious long-term consequences of chronicity and "irreversibility" of their asthma.

Status asthmaticus must be prevented. Self home-monitoring of peak flows in those at higher risk of status asthmaticus should be encouraged to enable patients and relatives to seek help early, even before symptoms arise.

"Maintain open lines of communciation between patient and physician. Promote positive patient-physician interaction. Use maintenance anti-inflammatory medications. Caution against abuse of beta agonists. Monitor daily peak expiratory flow rates in patients prone to severe attacks of asthma. Encourage patients to report progressive symptoms or peak expiratory flow rates less than 200 l/min. For asthma uncontrolled by bronchodilators and inhaled anti-inflammatory medications, treat promptly with systemic corticosteroids." (4)

There are more and more papers supporting the use of methylprednisolone in acute asthma. Oral methylprednisolone is as useful as intravenous (5). Methylprednisolone is beneficial in childhood status asthmaticus (6) and the message is that prompt use of methylprednisolone in the emergency treatment of severe asthma can prevent significant morbidity, reduce the number of hospitalisations and effect substantial savings in health care costs (7).

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