

Pitfalls in the Management of Bronchial Asthma

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Introduction

The incidence of asthma continues to rise world wide, doubling over the last 10 years¹. The prevalence of this disease has also increased, affecting 5-6% of general population.¹ The prevalence of asthma in our country is 2.38%.² This figure may actually be an under-estimate due to a tendency to under-diagnose asthma.^{3,4} The armamentarium for treatment of asthma comprises effective pharmacotherapy, good inhalation devices and availability of various guidelines.^{5,6} In spite of this, asthma still remains a poorly controlled disease as has been evidenced by several multinational community based surveys⁷⁻⁹. These surveys have shown that majority of asthmatic patients have a significantly high rate of symptoms alongwith poor symptoms perception, producing a significant impact on all aspects of patients' quality of life. This article discusses the various pitfalls leading to under diagnosis of asthma and its poor control. The **pitfalls** seen commonly in a clinical practice are as follows:-

1. Impractical guidelines.
2. Under-diagnosis of Asthma.
3. Ineffective inhalation therapy.
4. Ignoring concomitant disorder.
5. Ignoring common risk factors/triggers
6. Failure to deliver asthma education.

Impractical Guidelines

There are many guidelines^{5, 6} available for the management and prevention of asthma. The first of these was published by Global Initiative for Asthma (GINA) in 1995 as Global strategy for Asthma Management and prevention and these guidelines are periodically updated to incorporate the several advances in the field of asthma. Although these guidelines have been successfully disseminated to a large extent, yet their implementation has not been so successful in changing clinical practice of asthma.

Pitfalls

- i. Guidelines are too long and complicated which is not conducive to rapid understanding and implementation due to busy schedule of general physicians and general practitioners.
- ii. Guidelines are based on systematic reviews and meta-analyses which are usually funded by pharmaceutical companies and may bias opinion.
- iii. Guidelines don't take into account the variability in the availability and cost of pharmacological treatment across the globe.

Remedies

- i. Guidelines should be abridged and made more practical. There should be more emphasis on

simple diagnostic tool like peak flow meter for confirmation of diagnosis, and recommendation for drug therapy and inhalation device should be based upon the availability and affordability.

- ii. For effective implementation the target audience should include general physicians, GP's and residents who provide primary care to the majority of asthma patients.
- iii. The success of implementation process should be periodically evaluated using variety of assessment tools which provide a consistent and objective assessment of asthma morbidity or control. (e.g. Asthma control¹⁰ or Asthma control questionnaire¹¹).

Under-diagnosis of Asthma

In majority of cases, diagnosis of asthma can be made on the basis of good history and same can be confirmed by demonstrating reversible obstruction on spirometry. Following pitfalls leads to under-diagnosis of asthma which results in increased health burden from the disease.

Pitfalls

- i. **Atypical symptoms.** Chronic cough may be the sole or principal symptom in asthma.¹² Such patients are often labeled as having lower respiratory tract infection and treated with antibiotics and cough suppressants without any relief.
- ii. **Asthma in elderly.** In view of frequent presence of co-morbid diseases like cardiac disease or COPD, which may give rise to asthma like symptoms, poor perception of symptoms and acceptance of dyspnea as being normal in old age, diagnosis of asthma in elderly is frequently missed.
- iii. **Exercise induced bronchoconstriction.** Physical activity is an important cause of asthma symptoms for most patients and for some it is the only cause. The diagnosis of asthma may be missed in cases who develop symptoms only after physical activity unless lung-functions are

tested after exercise.

- iv. **Under utilization of lungs function tests.** Spirometry and peak expiratory flow meter are two commonly used tests for confirming the diagnosis of asthma. By using spirometry, 12% increase in FEV₁, calculated from the pre-bronchodilator value and a 200 ml increase in either FEV₁ or FVC indicates reversible airway obstruction and confirms the diagnosis of asthma. Although spirometry is the preferred method of confirming diagnosis, use of peak flow rate in determining reversibility (20% or more increase from pre-bronchodilator value) or variability of PEF (more than 20% with twice daily readings for 3 or more days in a week for two weeks) is a simple and practical method of confirming diagnosis of asthma. Whenever there is a strong suspicion of asthma based on symptoms but the spirometry is normal, no further attempts are usually made to confirm the diagnosis and patient is labeled as not having bronchial asthma. Underuse of spirometers and peak flow meters due to unavailability and inadequate knowledge about the standardization and interpretation of tests, especially in case of spirometers, lead to under-diagnosis of asthma.

Remedies

- i. Cough variant asthma (CVA) must be considered as one of the causes of chronic cough. The presence of triggers like cold air exposure, exercise, inhalation of aerosols are important clues to cough variant asthma. Since spirometry and peak flow monitoring are usually normal in CVA, the diagnosis usually depends on proper history, exclusion of other causes of CVA, demonstration of BHR by methacholine challenge whenever available and finally by giving a therapeutic trial with inhaled bronchodilators with or without steroids.
- ii. In elderly patients one must take proper history, thorough clinical examination, ECG, Chest X-ray, 2-D-Echo and spirometry to rule out

other co morbid diseases mimicking asthma like cardiac failure or COPD.

- iii. Whenever there is a history of asthma symptoms triggered only by exercise, exercise testing with baseline spirometry followed by post exercise spirometry (8 minute running protocol) can establish the diagnosis of exercise induced bronchoconstriction.
- iv. Peak flow meter, which is inexpensive, portable and easy to use, should be utilized by all doctors who are managing bronchial asthma. Patients in whom symptoms of bronchial asthma are present but spirometry and peak flow rates are normal, one can confirm the diagnosis by finding out the variability of more than 20%.

Ineffective inhalation therapy

Since inhalation route is the most effective method of delivering anti asthma drugs, most of which are available in inhaled form, inhalation therapy is a corner stone of management of bronchial asthma. The inhalation therapy was used by minority of patients few years back^{13,14} but now over a period of time this therapy is being increasingly used by majority of patients.^{15,16} However, this therapy has not been effective in controlling asthma because of following pitfalls:-

Pitfalls

- i. **Under use of inhaled corticosteroids (ICS)**
Although inhaled glucocorticosteroids are currently the most effective anti-inflammatory medications for the treatment of persistent asthma, yet there has been an under use of this drug by doctors. In a study by Rabe and colleagues⁹, patients with mild asthma used short-acting β_2 agonists (SABA's) more than ICS and in patients with moderate and even severe asthma, less than one third of patients were taking ICS. In another study from this country,¹⁵ (56.6%) patients were on inhaled steroids and out of which 62 cases (86.1%) were taking it in the low dosage range, less than 500 μg m / day of BDP or equivalent,
- and 36% of patients discontinued inhaled steroids after using it for periods varying between 2-4 weeks for reasons being "not effective" and "containing steroids". The reasons for under use of ICSs are simple lack of information about the role of ICSs in asthma and "corticosteroid phobia"¹⁷ among patients and doctors.
- ii. **Over use of short-acting β_2 agonists (SABAs)**
Patients with asthma over use SABAs because these provide immediate relief. In a study by Barthwal et al¹⁵, all (150) patients were on SABAs, out of which 74 (58.3%) were taking it on regular basis and 53 (41.7%) as on demand basis. SABA's should be used only 'as on need basis' at the lowest frequency. Regular use of β_2 agonists, apart from more side effects, may enhance early and late response to allergens leading to decreased control of asthma.¹⁸
- iii. **Incorrect inhalation technique.** Selecting the right inhalation device and ensuring the correct inhalation technique is a very important requisite for optimum control of asthma. A significant number of patients use inhaler devices incorrectly. In a study by Crompton and colleagues¹⁹, 21% of patients were able to use MDI correctly after reading the package insert and 52% were able to use it correctly after receiving instructions. By contrast, 89% of patients were able to use a drug powder inhaler (DPI) correctly following instructions. In a similar study¹⁵ from this country, inhalation technique using MDI was incorrect in 64% of cases whereas in case of DPI (rotahaler) the technique was incorrect in only 25.9% of cases. These studies suggest that DPI may be a better device than MDI but the correct choice of inhalation device differs from patient to patient. For correct use of these devices, proper demonstration need to be given by doctors and para medical staff and the technique has to be repeatedly counter checked for its correctness.

iv. **Poor compliance.** Asthma patients are frequently non compliant with treatment because of several drug related and non-drug related factors. Drug-related factors include: difficulty using inhaler device, complicated treatment regimens, side effects esp. corticosteroid phobia, costs and availability of drugs; non drug factors are due to social, cultural or religious causes and include: patients do not like being labeled as asthma misconceptions about inhaler devices (like causing dependency and to be used as a last resort in treatment), lack of basic education resulting in poor understanding of instructions. All these factors result in non-compliance with therapy thereby leading to poor control of disease. In a recently conducted Global Asthma Physician and Patient (GAPP) survey,²⁰ designed to uncover asthma attitudes and treatment practices among physicians and patients, four top reasons for non-compliance with treatment are:-belief that they do not need to take medication if their symptom go away, forget to take their medications, concern about side effects and belief that they do not need to take their medication so often.

Remedies

Since ICS are currently the most effective anti-inflammatory medication for the treatment of asthma following points must be remembered by physicians and GP's:-

- i. Knowledge about correct indications, various types of ICS and their equipotent dosages and safety profile.
- ii. All attempts should be made to reduce the side effects of ICS by using newer ICS, use of spacer with pMDIs and rinsing of mouth after each inhalation. Several comparative studies²¹⁻²³ have demonstrated that ciclesonide, budesonide and fluticasone propionate at equipotent doses have less systemic effects.
- iii. Current evidence suggests that in adults, systemic effects of ICS are not a problem at doses of 400 µgm or less of budesonide or

equivalent daily.²⁴ Hence the physician should aim for lowest possible dose for maintaining optimum control.

- iv. Patients must be informed about the importance of using ICS and their safety profile.
- v. When asthma is not controlled with medium dosages of ICS, then addition of long-acting β_2 agonist (LABAs) in a combination inhaler improves symptoms score, decrease nocturnal asthma, decreases the use of SABAs, reduces the number of exacerbation and achieves clinical control of asthma at a lower dose of ICS than ICS given alone.²⁴ These combination inhalers also increase compliance since they are more convenient for patients. However, there is a word of caution while using these combination inhalers. Since these are being increasingly used in treatment of asthma, there is a tendency to continue using the same fixed dose combination even after asthma is controlled and no attempt is made to down titration of steroid dose to minimum.²⁵ However, down titration to minimum dose with fixed dose combination inhalers is another problem since most of the combination inhalers with lower doses of ICS are not available.
- vi. SABAs must be prescribed as on demand basis and patients should be informed about the side effects of using SABAs on regular basis.
- vii. Selection of correct inhalation device should be based on age and ability to learn the correct inhalation technique. In younger (less than 6 years) patients, MDI with spacer with face mask or mouth piece is the preferred device. Older children and adults may use either MDI with spacer or DPI depending upon the ability to learn the inhalation technique. What matters most for ensuring correct inhalation technique is the demonstration of correct technique by doctor or para medical staff and counter checking it at each follow up.
- viii. For improving compliance, treatment regimen should be simple and wherever possible should

include combination inhaler, patients should be educated about the disease, significance of ICS, as on demand use of SABAs and correct inhalation technique.

Ignoring concomitant disorders

In patients who do not show adequate control of disease in spite of optimization of inhalation therapy, one should investigate the presence of comorbidities which lead to poor control like allergic rhinitis, sinusitis, gastro esophageal reflux and obstructive sleep apnea (OSA).

In one study²⁶ of 478 patients with allergic asthma, 99% of adults and 93% of the adolescents had concomitant allergic rhinitis. The prevalence of sinusitis in asthmatic has been reported to range from 40% to 75%²⁷. Gastroesophageal reflux (GERD), and OSA also aggravate asthma leading to inadequate control of symptom. Hence ignoring these concomitant disorders can lead to poor asthma control. The control of disease becomes better once these concomitant disorders are managed well.

Remedies

- i. During initial evaluation of asthma, the presence of these concomitant disorders should be found out by proper history.
- ii. When asthma becomes difficult to control in spite of optimum therapy, one should investigate the presence of sinusitis and GERD which may not present with significant symptom.

Ignoring common risk factors/triggers

Asthma exacerbation may be caused by a variety of triggers like allergens, pollutants, food and food additives and drugs. One must evaluate asthma patients for these risk factors especially when the control of disease is suboptimal in spite of optimal therapy. Following are the common risk factors:

- a. **Indoor allergies:** - Domestic mites, furred animals, cockroaches, fungi growing on the walls of house due to water seepage and humidity.

- b. **Outdoor allergies:** - Pollens and molds
- c. **Indoor air pollutants:** - Environmental tobacco smoke (ETS), nitric oxide, nitrogen oxides, carbon monoxides, carbon dioxide and formaldehyde.
- d. **Outdoor air pollutants:** - Ozone, nitrogen oxides, acidic aerosols and particulate matter.
- e. **Food and food additives:** - Sulfites, monosodium glutamate, yellow dye tartrazine and benzoate.
- f. **Drugs:** Aspirin and other NSAID's, β - blockers.

Remedies

Because many asthma patients react to multiple risk factors that are ubiquitous in the environment, avoiding all these factors is usually impractical. However following measures should be taken to reduce the exposure to triggers especially in the indoor environment:-

- i. Encase mattresses and pillow in impermeable covers.
- ii. Removal of carpeting and soft toys at least from the bed room.
- iii. Removal of pet from the house or at least from bed room.
- iv. No indoor smoking.
- v. Vacuum cleaning wherever possible.

Failure to deliver asthma education

Asthma education is an integral part of asthma management and all guidelines strongly recommend it. Asthma education comprises of informing patients about the disease, its causes, difference between relievers and controllers, correct use of inhaler devices, monitoring of disease, home management of acute exacerbation and steps to reduce the exposure to risk factors. Asthma education can be provided through information booklets, videos, demonstration and personal interaction. By not providing asthma education, patients compliance with treatment and optimum control cannot be achieved.

Remedies

- i. Asthma education should be an integral part of asthma management plan.
- ii. Methods of delivering education should be simple and easy to understand.
- iii. The common problem of not finding time by busy practitioner can be sorted out by training para medical staff who can easily deliver most of the components of asthma education.

Key Points to remember

1. Asthma management remains far from satisfactory in spite of advances in the pharmacotherapy and inhalation devices.
2. Common pitfalls in managing asthma can easily be overcome by proper evaluation, simple lung function tests and imparting asthma education.
3. Atypical presentations like cough variant asthma, co morbid diseases in elderly, exercise induced bronchoconstriction should always be kept in mind.
4. Peak flowmeter, although not a substitute for spirometry, is a convenient and cheaper screening test and should be used by all doctors in confirming asthma by demonstrating reversible obstruction and variability.
5. Importance of using ICS regularly and SABAs as on demand basis should be emphasized to patients.
6. Correct inhalation technique should be demonstrated and should be regularly counter checked.
7. In difficult to control asthma, concomitant diseases like allergic rhinitis, sinusitis, GERD and OSA should always be kept in mind.
8. Patients should be educated regarding avoidance of common risk factors like allergens, pollutants, especially from the indoor environment.
9. Asthma education should be an integral part of asthma management plan.

Summary

In spite of significant development in the fields of pharmacotherapy and inhalation devices, the morbidity and mortality from bronchial asthma continues to rise. There are many pitfalls in management of asthma, like impractical guidelines, under-diagnosis of asthma, ineffective inhalation therapy, ignoring concomitant disorders and risk factors and failure to deliver asthma education. These pitfalls can be easily overcome by dissemination and implementation of practical knowledge among physicians and general practitioners, who initially manage majority of cases of asthma. This article discusses all these pitfalls and their remedial measures

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