

## Review Article

# Improper Inhalation Technique-A Barrier to Good Asthma Control

RC Barman<sup>1</sup>, MMSU Islam<sup>2</sup>, R Saha<sup>3</sup>, T Alam<sup>4</sup>, SY Ali<sup>5</sup>, MY Ali<sup>6</sup>

### Abstract

Bronchial Asthma (BA) is a chronic airway disorder with significant morbidity and mortality but due to recent advances in the field of medicine most patients with BA can have complete symptom control and live a normal life. There are various routes of drug delivery for asthma control but among them aerosol inhalation is considered the optimal route. A number of pressured Metered Dose Inhalers (MDI) & Dry Powder Inhalers (DPI) are available for this purpose. However inhalation of therapeutic aerosols is not without difficulty, it requires precise instructions on the inhaler maneuvers, which is different from spontaneous normal breathing. Also, the characteristics of the inhaler device have to be suitable for the user. Available data indicate that, lack of knowledge demonstrated by health professionals & patients on the inhalation maneuvers & handling of inhalers resulting in a reduction of therapeutic benefit. The paper reviews the literature concerning the fundamental aspects of inhaler devices, inhalation maneuvers & device selection, in an attempt to increase the knowledge of and to optimize the clinical use of therapeutic inhalers. As a result of which Asthmatics can be kept under good control.

**Key words:** Bronchial Asthma, MDI, DPI, Inhalation technique, Rotahaler, Cozyhaler.

### Introduction :

Around 300 million people in the world currently have asthma and by 2025 it has been estimated that a further 100 million people will be affected<sup>1</sup>. But due to advances in the field of medicine, great progress has been achieved in the treatment of asthma. Current evidence based guidelines suggest that most patients with asthma can have complete control and live a normal life unrestricted by symptoms or side effects of treatment. Asthma symptoms can be controlled with the appropriate treatment regime. Good asthma control according to Global Initiative for Asthma (GINA) means that any person sufferings from asthma has no daytime symptoms, no nighttime awakening due to asthma, no need for rescue medication, no exacerbation, no limitation of activity including exercise and nearly normal lung function<sup>2</sup>. Although many clinical trials

have shown that good control can be achieved in most patients and this is not the situation in most audits of large groups in real life outside trials<sup>3</sup>. In a US study, nearly three quarters of 60,000 patients showed lack of control of asthma and over three quarters had their activities limited in the previous week<sup>4</sup>. Although it is possible to achieve good control of asthma and patients would prefer to be symptom free, this is not always achieved. There are various reason for inadequate asthma control among them improper inhalation technique is very important and correctable one.

### Assessment of symptom control:

It is a difficult job to assess symptom control in BA. However, various questionnaires have been developed to produce a standard approach to assessment of symptoms control. The Royal College of physicians has devised three questions recommended as an audit tool by the British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN)<sup>5</sup>.

The questions are

1. Have you had difficulty sleeping because of asthma symptoms (including cough)?
2. Have had your usual asthma symptoms during the day (cough, wheeze, chest tightness<sup>1</sup> or breathlessness)? And
3. Has your asthma interfered with your normal activities (for example, housework, work, school)?

### Barrier of Asthma control:

Followings are the barriers to achieve good asthma control:

1. Incorrect / under diagnosis.

1. Dr. Rakhil Chandra Barman, DTCD, Assistant Professor, Dept. of Respiratory Medicine, FMC, Faridpur.

2. Dr. M.M. Shahin-Ul-Islam, FCPS (Medicine), MD (Gastroenterology), Assistant professor, Dept. of Gastroenterology, FMC, Faridpur.

3. Dr. Radheshyam Saha, FCPS (Medicine), MD (Neurology), Assistant professor, Dept. of Neurology, FMC, Faridpur.

4. Dr. Towhid Alam, FCPS (Medicine), Assistant professor, Dept. of Medicine, FMC, Faridpur.

5. Dr. SK. Yunus Ali, MD (Cardiology), DTCD, Assistant professor, Dept. of Cardiology, FMC, Faridpur.

6. Dr. Md. Yusuf Ali, FCPS (Medicine), Associate professor & Head, Dept. of Medicine, FMC, Faridpur.

### Address of correspondence

Dr. Rakhil Chandra Barman, DTCD, Assistant Professor, Dept. of Respiratory Medicine, FMC, Faridpur. Mob: +88-0171-8476748, E-mail: rakhilbarman@yahoo.com.

2. Side effects of drugs or worries about such effects.
3. Improper inhalation technique.
4. Lack of belief/ trust in treatment.
5. Lack of insight into illness.
6. Poor patient provider relationship.
7. Inadequate follow up and discharge planning.
8. Lack of institutional asthma care centre.
9. Complexity of treatment.
10. Environmental hazards.

### **Optimum route of delivery of asthma medication:**

Asthma is the disease of lungs and it makes sense to apply the medication to the lungs rather than the whole body. A variety of delivery devices have been developed for this reason viz.-MDI, Nebuliser, Rotahaler, Cozyhaler etc. In asthma management the choice of delivery device or the right delivery device used wrongly, may be only reason that some patient's gets out of control. For this reason the BTS/SIGN guidelines (2005) recommend that inhalers should only be prescribed after patients have received training in their use. Inhaler technique should be assessed to ensure that the individual can demonstrate satisfactory technique. The physician should teach each patient the correct technique when therapy is started and should check again on follow up examination of patients to obtain maximum benefit from aerosol therapy. If the technique is poor, the patient will not get the maximum benefit from treatment. There is also misuse or wastage of drugs. This is why the patient should be taught how to inhale the medicine correctly. The instructions should be repeated often. Each time the patient visits the health facility, the patient should perform the technique in front of the healthcare provider to check that the correct technique is being used. The difficulty of technique is the need for coordination between the patient's hand to press on the base of the inhaler so that the aerosol penetrates deeply into the airways and does not exit via the nose. Written instruction alone is inadequate in teaching correct inhalation technique. Verbal instruction and technique assessment are essential for patients to achieve proper technique<sup>6</sup>. Even with optimal technique only 10% to 30% of medication in a MDI actually reaches the patient lungs<sup>7</sup>. All patients taking inhaled corticosteroids should use large volume spacer. A spacer ensures maximum delivery of the medication into the lower respiratory tract with minimal deposition of the medication in the upper airway. In addition, the use of spacer is easier for the patient because there is no need for coordination between breathing and movement of the hand to press the base of the inhaler. The healthcare provider should check that the patient perform each of the steps correctly when using the spacer. The pharmacists, nurses and other healthcare providers of Bangladesh have minimum knowledge or training about the inhalation technique. So, all of them including family member need to be trained adequately.

### **Correct use of various devices to ensure adequate drug delivery<sup>8</sup>:**

#### ***Correct technique for using MDI without spacer:***

1. Take the cap off inhaler mouthpiece.

2. Shake the inhaler.
3. Hold the inhaler upright.
4. Breathe out.
5. Place the inhaler mouthpiece between the lips (and the teeth); keep the tongue from obstructing the mouthpiece.
6. Trigger the inhaler while breathing in deeply and slowly.
7. Continue to inhale until the lungs are full.
8. Hold the breath while counting to 10.
9. Breathe out slowly.

#### ***Correct technique for using MDI with spacer (inhalation chamber):***

1. Take the cap off inhaler mouthpiece.
2. Shake the inhaler.
3. Connect MDI mouthpiece to the back of the spacer.
4. Put spacer's mouthpiece between teeth & close the lip around it.
5. Actuate canister once, inhale slowly & deeply 3-5 times.

#### ***Correct technique for using breath actuated MDI:***

1. Take the cap off inhaler mouthpiece.
2. Cock the level at the top (auto haler).
3. Shake the inhaler.
4. Hold the inhaler upright.
5. Breathe out.
6. Place the inhaler mouthpiece between the lips (and the teeth); keep the tongue from obstructing the mouthpiece.
7. Trigger the inhaler while breathing in deeply slowly.
8. Continue to inhale until the lungs are full.
9. Hold the breath while counting to 10.
10. Breathe out slowly.

#### ***Correct technique for using the DPI:***

1. Remove mouthpiece cover.
2. Sit upright or stand.
3. Exhale deeply, away from the mouthpiece.
4. Put mouthpiece between teeth & close lips around.
5. Inhale deeply & forcefully.
6. Remove inhaler from the mouth.
7. Hold breath for 10 seconds
8. Breathe out slowly.

### **Conclusion:**

In conclusion it is urged that asthmatic patient should inhale medicine correctly to get the maximum benefit. Among the various ways of treatment, inhalation of medication is the best approach to keep asthma under control. In addition to correct technique, other barriers must be addressed individually and a good partnership among patient, physicians and healthcare providers should be developed.

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