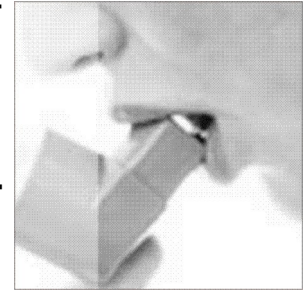


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## USE OF METERED DOSE INHALERS; PATIENT'S FEARS AND OBJECTIONS, ERRORS IN THEIR TECHNIQUES. A REFLECTION OF POOR PATIENT EDUCATION IN ASTHMATICS



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**ABSTRACT...** [ranamohsindr1@hotmail.com](mailto:ranamohsindr1@hotmail.com). Inhalational bronchodilators and anti-inflammatory therapy is the ideal treatment for asthmatics. Successful management depends on active and continuous interaction between the clinician and a well-educated patient. Detailed interview of patients were carried out to determine the patients' fears about MDI and the errors in technique were recorded. This would highlight the common deficiencies in the management in our own socioeconomic setup. **Materials and methods:** Any patient with a diagnosis of Bronchial Asthma was assessed for the competency of diagnosis. A specially trained nurse interviewed the eligible patients on a prescribed performa who were using MDI to determine their fears and objections on its use. They were asked to demonstrate their technique of MDI use and errors were noted. The physician checked all the information and confirmed that technique has been corrected and the fears addressed. Patients below the age of 16 or over the age of 60 were excluded. Seriously sick patients and patients of COPD were excluded. Asthmatics presently not using MDI were excluded. Study was carried out from January to December 2003. **Results:** 192 patients were enrolled during one-year period, from January to December 2003, in this study. There were 112 males and 80 females 46% of patients rejected MDI considering it as the last resort, 54% perceived it as costly, for 58% it was a complicated way to use medicine, 54% considered it ineffective, 50% feared life long dependency, 54% disliked it as MDI would incite cough, 29% objected on the oral thrush and 13% on dysphonia associated with them and for 21% it was socially un-acceptable to use MDI in public. When inhalation technique for MDI was checked, all checked for empty canister by shaking. 92% could find out if the demo canister was empty. All removed the cap properly. 92% shook the MDI before use while 8% failed to do so. 79% used it in proper upside-down position. Hand-Lung co-ordination was proper in only 29% of patients. 49% held their breath for adequate time. 38% made proper slow exhalation. 38% performed actuation with open mouth and 63% with mouth closed on MDI mouthpiece. 33% swallowed the drug after actuation, leakage from mouth was seen in 29% and leakage of fumes from nose was seen in 54% of patients. Multiple actuations were done by 50% of patients. **Discussion:** Bronchial Asthma is a common clinical disorder requiring long-term treatment. Inhalational delivery systems like MDI are the ideal mode of therapy. Use of MDI is stigmatized, partly contributed by patients' dissatisfaction from results due to improper technique and partly attributed to the social inhibitions attached to its use. We defined, addressed and

made effort to correct their technique. More emphasis on different aspects of patient education is the only way to improve our standard of Asthma care.

**Key Words:** Bronchial Asthma, MDI.

## INTRODUCTION

This study is the continuation of a previous publication titled "An audit of the management of bronchial asthma and assessment of patients' awareness level about different aspects of their disease".

This study is an attempt to assess patients' fears and objections on Metered Dose Inhalers (MDI) and the incidence of errors in its use. After ensuring the competence of the diagnosis of Bronchial Asthma, specially trained nurses interviewed the patients about the fears or objections of the patients about MDI use. The physician required the patients to actually inhale from an MDI in their presence to note down the errors in the technique. Off course any error was corrected by repeated education by the nurses.

They were also asked if they had any idea of the mechanism of action of the drugs in their MDI, were they explained and demonstrated for the proper technique of MDI use at the time of prescription, were their technique of use of MDI checked at each clinical examination and the errors were noticed and corrected. This study shall draw our attention to the missing effort on the part of clinicians thereby improving the standard of Asthma management for our patients through their education.

## MATERIALS AND METHODS

The medical specialist evaluated all the patients presenting to outdoor "ASTHMA CLINIC" with a diagnosis of Bronchial Asthma for the competency of the diagnosis. Guideline issued by 1991 NAEPP Expert Panel Report revised in 2002<sup>1</sup> was followed which requires that episodic symptoms of airflow obstruction are present based on history, examination and relevant investigation, are at least partially reversible and alternative diagnosis have been excluded to make a

competent diagnosis.

If diagnosis was found to be competent and they were using MDI, patients were enrolled in the study and were asked to fill a performa with the help of specially trained nurses. The treating physician rechecked adequacy of education. This study was carried out at a local hospital in Faisalabad, Pakistan, where a special Asthma clinic is arranged twice a month on specified dates. Patients were examined by any of the participating physicians. Study was carried out from January to December 2003.

## INCLUSION AND EXCLUSION CRITERIA

Any patient who had a competent diagnosis of Bronchial Asthma and was using MDI was enrolled. Seriously sick patients were excluded. Patients under the age of 16 or over the age of 60 were excluded. Patients with clinical diagnosis of Chronic Obstructive Pulmonary Disorder (COPD) were excluded even when they may be using MDI devices.

## RESULTS

192 patients were enrolled during one-year period, from January to December 2003, in this study. There were 112 males and 80 females. 136 patients belonged to urban background and 56 were from rural background. 96 patients reported good socioeconomic status, 64 were from average and 32 belonged to poor socioeconomic class. 80 patients had family history of Asthma and 56 patients had history of atopy in the immediate family.

32 (16.7%) patients, all females were less than 30 years old. 48 (25%) patients, 32 males and 16 females, were between 30 to 39 years of age. 56 (29%) patients, 24 males and 32 females, were between 50 to 59 years of age. 40 (20.8%) patients, 16 males and 24 females. 17%

patients were uneducated, 25% had 5 years of schooling, another 25% had 8 years of schooling, 17% had 10 years of education, 4% had 12 years of schooling, 8% were graduates and 4 were having post-graduation to their credit.

Concept	No. yes	%age	No saying No.	%age
Last Resort	88	46	104	54
Costly	104	54	88	46
Complicated	112	58	72	38
Ineffective	104	54	88	46
Dependency	96	50	96	50
Incites Cough	104	54	88	46
Oral Thrush	56	29	152	79
Dysphonia	24	13	168	88
Socially Unacceptable	40	21	152	79

37.5% patients were asthmatic for upto 5 years, 12.5% were asthmatic for 6-9 years, 8.3% were asthmatic for 10-19 years, 29.1% were asthmatic for 20-29 years and 12.5% were asthmatic for more than 30 years.

46% of patients rejected MDI considering it as the last resort, 54% perceived it as costly, for 58% it was a complicated way to use medicine, 54% considered it ineffective, 50% feared life long dependency, 54% disliked it as MDI would incite cough, 29% objected on the oral thrush and 13% for dysphonia associated with them and for 21% it was socially un-acceptable to use MDI in public.

Table I. If patient was not clear about any of these questions i.e. failing to say both no and yes responses, it was not entered in the pool. When inhalation technique for MDI was checked, all checked for empty canister by shaking.

Step	Done properly	%age	Done improperly	%age
Canister Empty	176	91,6%	16	8.4%
Cap Removal	192	100%	-	-
Shake	176	91,6%	16	8.4%
Upright Position	152	79.2%	40	20.8%
Hand-lung Co-ordination	56	29,2%	136	70.8%
Breath Holding	88	45.8%	104	54.20 %
Slow Exhalation	72	37.5%	120	62.5%
Mouth Open	72	37.5%	120	62.5%
Mouth Close	120	62.5%	68	35.4%
Swallow	64	33.4%	128	66.7%
Leakege Mouth	56	29.2%	136	70.8%
Leakege Nose	104	54.2%	88	45.8%
Multiple Actuation	96	50%	16	8.4%

92% could find out if the demo canister was empty. All removed the cap properly. 92% shook the MDI before use while 8% failed to do so. 79% used it in proper upside-down position. Hand-Lung co-ordination was proper in only 29% of patients. 49% held their breath for adequate time i.e. for more than 5 seconds after inhalation.

38% made proper slow exhalation. 38% performed actuation with open mouth and 63% with mouth closed on MDI mouthpiece. 33% swallowed the drug after actuation, leakage from mouth was seen in 29% and leakage of fumes from nose was seen in 54% of

patients. Multiple actuations were done by 50% of patients.

Table,II. One patient could have done the same step in two different ways in different attempts e.g. One actuation with mouth open and the other with mouth close on the mouthpiece.

## DISCUSSION

We enrolled 192 patients during one-year period. We had a smaller number of patients than expected over one year period due to the stringiest criteria of a qualified asthmatic patient on MDI at the time of enrollment. In our socioeconomic setup very few patients accept to use a MDIs as the preferred mode of inhalational drug therapy system. We had representation both from rural and urban groups in both sexes, from all educational backgrounds and with different duration of asthma as discussed above in the results section.

As in all other chronic diseases, education about asthma should be aimed at altering patients' behavior rather than simply providing knowledge<sup>2,4</sup>. The education must be provided at each patient contact and shall ensure good communication between health professionals and have interactive coordination of the interventions.

Inhalation therapy is now considered the best way to deliver respiratory medicine. In our socioeconomic system, like many other taboos, a lot of resistance is seen in the patients against inhalational therapy, mainly Metered Dose Inhalers (MDI). In our study, among patients who were using the MDI, fear of being last resort (46%), being costly (54%), complicated (58%), ineffective (54%), causing life long dependency (50%), causing cough (54%), oral thrush and dysphonia (29%), being socially un-acceptable to use MDI in public (21%) were the concern or objections given by the patients. (Table 1). When this is the situation among patients who are actually using MDI at the time of this study, one can well imagine the situation for the patients who had rejected to use them.

It again points to the need of more effort on part of

clinicians in education of the patients. There is rational answer to each of these objections. MDI only appears to be costly, there are usually 200 doses in one canister and per dose cost is quite affordable. It is not the last resort; it is rather a preferred mode of drug delivery where very minute amount of drug is delivered directly to the respiratory system thus minimizing the side effects. Beta2 agonists are delivered without any significant side effects.

Adults who are not having underlying cardiovascular disease perfectly tolerate upto 20 puffs given at half hourly interval for 24 hours. Similarly long-term steroids can be administered without remarkable side effects. The fear of being last resort has been contributed by the common practice of nebulizing in the clinics and not prescribing MDI for regular use at home. This can also be brought to the notice of the patient that the rescue prescription meant for a severe attack still contains the same medicine in oral form.

Question of life long dependency can be addressed by impressing upon the fact that life long diseases do need life long treatment. Patient perception of MDI being ineffective is dominantly due to the in-appropriate technique and partly due to failure to increase the dose appropriately in response to worsening of symptoms. As MDI with Beta2 agonists alone are much cheaper than the steroid or combination preparations, most of the patients are using bronchodilators only. The fact remains that Bronchial Asthma is an inflammatory disorder and need anti-inflammatory drugs, mainly steroids, as a maintenance therapy. Beta2 agonists are the bronchodilators meant for SOS use or to control the symptoms, having no role in modifying the underlying pathological process. The problem on inciting cough, oral thrush or dysphonia can be addressed by proper technique, doing gargles after steroid containing preparations or by the use of a spacer device.

Successful use of MDI needs intensive effort on part of the clinician to train the patient in its proper use. A very safe mode of drug delivery is being underutilized. Even, for example, in a specialized respiratory care center or

pulmonary function laboratory, approximately 40 percent of patients first assessed will not use their MDIs in the best manner<sup>5,7</sup>.

Proper use of an MDI involves multiple steps, hand-lung co-ordination being the most important<sup>8,12</sup>. When we asked to demonstrate inhalation technique with a demo MDI, all checked for empty canister by shaking. 92% could find out if the demo canister was empty. All removed the cap properly. 92% shook the MDI before use while 8% failed to do so. 79% used it in proper upside-down position.

Hand-Lung co-ordination was proper in only 29% of patients. 49% held their breath for adequate time i.e. for more than 5 seconds after inhalation. 38% made proper slow exhalation. 38% performed actuation with open mouth and 63% did with mouth closed on MDI mouthpiece, both methods are acceptable. 33% swallowed the drug after actuation, leakage from mouth was seen in 29% and leakage of fumes from nose was seen in 54% of patients. Multiple actuations were done by 50% of patients, Table, 2. It speaks very loudly of our inability in training our patients. This has definitely contributed toward dissatisfaction of the patients about the efficacy of MDIs.

In particular, it is essential that clinicians demonstrate, review, evaluate, and correct inhaler/spacer/holding chamber technique at each visit because these skills deteriorate rapidly. Written instructions are helpful but insufficient. Patients tend to make specific mistakes in using inhalers that need to be corrected. Patients especially need to be reminded to inhale slowly and to activate the inhaler only once for each breath<sup>13,18</sup>. Somehow smokers learn the technique very quickly.

Finally, it is important for the patient to determine when the canister is empty. A common technique is to drop the canister into a pan of water and observing whether it floats. However, this method has been shown to be unreliable. Although devices can be added to the MDI to monitor the number of actuations, one easy technique is to simply have the patient maintain a log of the number

of actuations, and to dispose of the device when the designated number of actuations has been reached<sup>19</sup>. Otherwise one can afford to waste one actuation to check if the canister is empty.

Spacer devices though little bit cumbersome and difficult to manage for a mobile patient, are very useful in obviating the need for, difficult-to-learn, hand-lung co-ordination. It is also not associated with oral thrush or dysphonia associated with inhaled steroid use through MDI. Newer devices are actuated by the patient's intake of a breath, eliminating the need to coordinate inhalation and hand actuation.

Preliminary studies suggest that these devices deliver the medication more efficiently<sup>20,22</sup>. As a cost-saving measure, caregivers or patients sometimes construct homemade holding chambers. Although devices made from recycled plastic drips of 500ml or 1000ml or Styrofoam hot beverage cups may work, their delivery characteristics are untested and must be regarded as unreliable<sup>23</sup>.

This study very strongly points to the need of more effort on patients' education in the following areas. Patients fears and misbelieves about MDI use shall be addressed and they shall be taught to the satisfaction of the clinician for proper technique of MDI use. Spacers may be used for difficult to train patients. All can be achieved without any extra resources and patient education is the mechanism through which patients learn to successfully accomplish those tasks. It is also a powerful tool for helping patients gain the motivation, skill, and confidence to control their asthma<sup>24,25</sup>. Asthma education can be cost-effective and can reduce morbidity for both adults and children, especially among high-risk patients.

Education tailored to the needs of the individual patient, considering cultural or ethnic beliefs or practices that may influence self-management activities and modified educational approaches, are needed. Cultural variables may affect patient understanding of and adherence to medical regimens. Every effort should be made to discuss asthma care, especially the self-management

plan, in the patient's native language so that educational messages are fully understood<sup>26,28</sup>.

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**The Great Pleasure in Life Is Doing What People Say You  
Cannot Do.**

**Shuja Tahir**