ORIGINAL ARTICLE

Inhaler Technique among Doctors: A Survey in Hospital USM

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Summary

A survey of inhaler technique using a placebo metered dose inhaler was performed among 41 house and medical officers from the Medical and Outpatient departments, Hospital USM. The majority (76%) of them had been taught at one time or another regarding inhaler technique. However, only 18 of them (48.9%) used the metered dose inhaler correctly. Medical officers currently in the Medical Department had the highest percentage of correct technique (75%); followed by medical officers in the Oupatient Department (57.1%). Among house officers, 30.8% demonstrated correct technique. The most common error was failure to hold their breath after inhaling the aerosol (53.7%).

Key words: Inhaler technique, aerosol therapy.

Introduction

The use of the metered dose inhaler (MDI) has made the management of bronchial asthma easier, safer and more effective. However, much of the efficacy of the MDI depends on the correct inhalation technique. A patient who is prescribed a MDI should receive good instruction and training in the use of a MDI. Inadequate technique would not only result in loss of efficacy but also monetary loss to the prescribing party. In most surveys, a significant number of patients failed to use the metered dose inhaler well[1,2,3]. After demonstrations of inhaler use in this group, the failure rate decreased from 50.9% to 17.5%[3].

Doctors who manage asthma would need to teach and check their patients' inhaler technique. However, no figures have been quoted on how well doctors use metered dose inhalers. With this in mind, it was decided to survey the inhaler technique among a group of doctors who have prescribed inhalers to their patients.

Materials and Methods

House officers and medical officers working in the Medical and Outpatient departments were selected for the survey. A total of 41 doctors were enrolled in the survey. They consisted of 8 medical officers from the Medical Department, 7 medical officers from the Outpatient Department and 26 house officers in various departments.

The survey was carried out over a period of 2 days. A checklist consisting of 5 points regarding the use of the MDI by the closed mouth technique was prepared. At the survey, the doctors were asked to demonstrate how to use the placebo metered dose inhaler. They were allowed 2 trials. Their best

performance was recorded using the prepared checklist. Their technique was judged to be inadequate if they failed to either

1. activate the inhaler once during aspiration; and/or

2. hold their breath at the end of inspiration[4].

They were then asked whether they were taught how to use the MDI during their undergraduate days or while at work.

Results

Eighteen doctors (43.9%) demonstrated good inhaler technique. Six were medical officers in the Medical Department, 4 were medical officers in the Outpatient Department and 8 were house officers. The other 23 doctors (56.1%) had inadequate technique. Two were medical officers from the Medical Department, 3 were medical officers in the Outpatient Department and 18 were house officers (Table I).

Table I
Technique of inhaler use among 41 doctors

	Adequate technique	Inadequate technique	Total
Medical officers in Medical Department	6 (75%)	2 (25%)	8
Medical officers in Outpatient Department	4 (57.1%)	3 (42.9%)	7
House officers	8 (30.8%)	18 (69.2%)	26
Total	18	23	41

Common errors in the use of the metered dose inhalers include, not only holding their breath after inhalation (53.7%), but also, failing to exhale completely prior to inhalation of the metered dose (46.3%); not activating the device on inspiration (41.5%), with the majority depressing the canister at the end of inspiration; not adequately covering the mouthpiece (31.7%); and failing to shake the inhaler (26.8%) (Table II).

Table II
Steps in using metered dose inhaler and the percentage of doctors who omitted these steps

Steps in inhaler technique	% who omitted (n=41)
1. Shaking the inhaler	26.8
2. Full exhalation	46.3
3. Inspires and depresses the canister	41.5
4. Covers mouthpiece adequately	31.7
5. Maintains inspiration	53.7

Only 22 doctors (53.6%) were taught how to use the inhaler at undergraduate level. Eighteen (44%) were taught how to use the inhaler as a doctor. Only 10 doctors (24.4%) were not taught either formally or informally regarding the use of the metered dose inhaler (Table III).

Table III
Response when asked if the use of the metered dose inhaler had been formally taught previously

	Yes	No	Total
Medical officers in Medical Department	8 (100%)	0	8
Medical officers in Outpatient Department	4 (57.1%)	3 (42.9%)	7
House officers	19 (73.1%)	7 (26.9%)	26
Total			41

Discussion

The metered dose inhaler is one of the main methods of delivery of asthmatic medications. Its primary function is to deliver aerosolised suspension containing the active drug to the tracheobronchial tree. This method delivers the drug to its main site of action. The patient will be administering only a small dose of the required drug to achieve the maximum benefit and will be spared the side-effects of systemic administration of the drug if it were to be given orally.

The efficacy of the metered dose inhaler depends very much on the amount of drug that is deposited in the lungs. Depending on the patient's inhaler technique, this may vary from almost no drug to about 20%[5]. Even when used optimally, only 10% of the dose reaches the smaller airways, with most of the drug distributed around the upper airways[6]. The most important factors in the technique are correctly-timed aerosol release coordinated with slow, deep inhalation and a period of breath-holding. Incorrect technique will cause deposition of the therapeutic aerosols in the oropharynx and large conduction airways[7].

In our hospital, the usual practice is for the pharmacists to instruct patients on how to use a MDI. However, in one evaluation, only 13% of the pharmacists offered to instruct on the use of the MDI[8]. Only 1 out of 52 pharmacists surveyed actually demonstrated the technique of inhaler use.

Therefore, the task of educating patients on the use of MDIs should be shouldered by the attending doctors. They would not only be able to teach and show the patient how to use the inhaler, but would also be able to see that the patient used it correctly. The doctor could also assess the patient at a later date, either while the patient is still in the ward or as an outpatient. The demonstration of the use of the MDI reduced the incidence of incorrect use in patients compared to just verbal instruction or reading from the drug inserts[3,9]. Before being able to demonstrate to the patient, the attending doctor should be competent in his or her inhaler technique.

Our survey found that 43.9% of doctors demonstrated good inhaler technique. This is not acceptable for a group of professionals who will be instructing their patients on proper usage of inhalers. For comparison, 45% of a group of asthmatics who were prescribed inhaler devices had satisfactory technique. In elderly patients, 60% were judged to be competent, but only 10% had an ideal technique[2].

The group of doctors who performed most poorly were the junior house officers. All but 5 had done their medical posting, during which they were taught the technique of using a MDI. Indeed, 73.1% claimed that they had been taught, at one time or another, in the use of the MDI. House officers would be the first to attend to the patient in the ward. They would also be expected to assess the patient's daily condition and progress. Thus, as the doctors in the 'front-line', they should actively participate in the education and assessment of MDI technique among their patients. The majority of the medical officers in the medical

and outpatient departments performed adequately in the survey. These more experienced doctors should share their knowledge with the junior house officers.

Among the common errors by the doctors in the survey was failure to maintain inspiration after inhalation of the aerosol. This is emphasised because it is one of the steps which enhances the deposition of the aerosol in the lungs[5]. The next common error was failure to inspire from full expiration. This is not such an important factor in obtaining optimal benefits from the MDI, as tests have shown that lung volume at the time of aerosol release has no significant effects upon bronchodilator response[10]. The third error was poor synchronisation on the timing between actuation of the MDI and inhalation. Forty one percent of the doctors surveyed could not perform this step adequately. This was the commonest error encountered in other studies and is probably the most important determinant of inhaler technique[2,11]. Reinforcement of the lesson is as important, as some studies show that the adequacy, even among patients who use the MDI on a regular basis, declines with time[4].

In summary, the technique of using metered dose inhalers among junior doctors was poor although the majority of these doctors had been taught at some time or other regarding the use of metered dose inhalers. More emphasis should therefore be given to this simple and important treatment modality to the junior doctors. This should improve the competence of the junior doctors and, more importantly, help them educate their patients when they prescribe a metered dose inhaler.

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