

Correct or incorrect use of inhalers in patients with dyspnea

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Abstract

Introduction:

One of the medications used by patients with dyspnea and asthma is sprays whose the way of application is very important. If these medications are not used properly, they will not be effective. The purpose of this study was to investigate the correct or incorrect use of sprays by patients.

Material and Method:

This double-blind observational analytical study was conducted on patients attending clinics in Jahrom from 2009 to 2013 selected by convenience sampling method. After obtaining patient's consent, a researcher-made questionnaire was completed by the patients and then they were asked to use spray in the presence of another researcher and then to complete the second questionnaire on how the patient should use the spray. Finally, the data were analyzed.

Results:

Of a total of 468 participants in this study, 43.6% (n=204) used sprays correctly, and 95.1% of them were trained in this regard. Incorrect use of sprays was observed more in men and older people and there was no relationship between the correct or incorrect use and patients' education level.

Conclusion:

Training patients with dyspnea how to use sprays is the essential component of prescribing these medications, and physicians and healthcare providers should consider providing training on correct use of sprays to increase the effectiveness of medications.

Keywords: Dyspnea, inhaler, correct usage

Introduction

Dyspnea is one of the reasons for which several patients visit specialist clinics. These patients suffer from acute asthma exacerbations caused by various agents, including air pollution, dust and contact with allergens. Asthma and bronchitis are the major diseases causing dyspnea in patients. Asthma is a condition characterized by the narrowing of the airways and an increased airway reactivity to different stimuli signaled by wheezing, shortness of

breath and coughing. Based on studies, about 300 million people suffer from asthma around the world and this number will reach 400 million by 2025 (1 & 2). The prevalence of asthma is estimated to be around 5.5% in Iran and reaching 10% in the case of children. Its prevalence rate for patients under the age of 18 is reported to range from 2.7% in Kerman to 35.4% in Tehran and the mean prevalence of symptoms of asthma is estimated to be 13.14% throughout the country (3).

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Although symptoms of this disease might alleviate spontaneously or through the use of medications (4), the resulting ill health might cause physical and mental impairment and disrupt social growth and development (5). Therefore, one of the main goals for clinicians and health workers is to control the symptoms of this disease in order to prevent disability and minimize physical and mental illness of the patient and making normal life possible for him (5). It should be noted that asthma is a disease observed only in a portion of dyspnea patients and that patients with dyspnea can suffer from a wider variety of diseases. Nevertheless, asthma and dyspnea treatment needs training and collaboration on the part of patients (4).

Asthma or dyspnea is a chronic disabling disease inflicting patients with a lot of hardship during their lives and with a treatment that imposes great financial burden on the society. Therefore, there is a lot of emphasis on finding treatment methods for this disease and physicians are always looking for simpler, more effective ways to decrease the patients' suffering (6). Proper treatment methods for patients with asthma improve their quality of life and also reduce their health care costs (7). It has been shown that devising plans for training patients on the treatment of asthma can be effective in improving their health (8). However, a great percentage of patients tend to not feel well and complain about dyspnea due to not having fully completed the treatment process. Nowadays, inhaled bronchodilators, inhaled corticosteroids, leukotriene receptor antagonists and oral corticosteroids are commonly used to control asthma (9). Inhaled medications used for patients with dyspnea are available in three forms: metered-dose inhalers, dry powder inhalers and nebulizers. Using these inhaled medications completely depends on their method of application (10). Particular emphasis is put on the use of nebulizers nowadays for treating these

patients. These devices turn the medication into small particles that can penetrate deep into the lung. Some physicians recommend advanced nebulizer designs such as the air jet, the ultrasonic or the mesh nebulizer for treating asthma (11). However, the use of nebulizers requires specific training and the investment of time, and its use and acceptance by the patients is under investigation in some countries such as Romania, where these devices are not widely used (12).

In Iran, a common treatment for obstructive lung disease is the use of metered-dose inhalers maximizing the therapeutic effects of the medication and having fewer complications compared to other methods (13).

In many patients, despite full adherence to inhaler use instructions, the problem of incorrect use still persists. In other words, due to incorrect use, the amount of medication entering the patient's airways is low, and is also partly deposited on the tongue and the back of the throat, and partly wasted in the air. In such cases, a spacer can solve the problem to a certain extent (13). In these cases, not only is the disease not controlled and the patient's suffering not reduced, but also the medication is wasted and economic loss ensued. In studies conducted in the US by Wilson et al., a major reason for the patients' failure to fully recover is reported to be their misuse of inhalers (14).

The question arises as to how much the incorrect use of these inhalers is estimated to be in Iran and whether or not factors such as level of education, gender and previous training can affect the use of these medications. The present study seeks, on the one hand, to determine the proportion of people not using their inhalers properly, and on the other hand, the frequency of each factor affecting its use. Groups requiring training are thus better identified and more effective steps can be taken toward planning for training the proper use of inhalers.

Materials and Methods

This observational analytical study was carried out from 2009 to 2013 using the consecutive non-probability sampling method. Participants were selected from the patients admitted to clinics in the city of Jahrom and those hospitalized in internal medicine ward provided they had expressed their full consent to participate in the study. Inclusion criteria consisted of having been diagnosed with dyspnea for over 10 years along with the use of inhalers. At the beginning of the study, the patients were asked to respond to a set of predesigned questions. These questions included, demographic information (gender and age), level of education and whether or not they had previous training on the use of inhalers. After responding to the questions, the patient was guided to the next researcher, who was unaware of the patient's training status and who then showed him how to use the inhaler. Two points taken into consideration in the proper use of inhalers included: A. Proper holding of the inhaler so that the patient can properly press down the canister and the mouthpiece is adjusted below and facing the mouth. B. Effective inhaling so

that the patient can breathe enough of the inhaled medication into his lung. If the patient managed to inhale at least half of the active ingredient in the spray into his lung, the observer would identify him as a proper user. Collected data were statistically analyzed in SPSS software.

Results

Of the 468 patients admitted to the clinics of Jahrom and who used inhalers, 204 (43.6%) used the spray properly. The mean age of patients studied was 17.2 ± 44.27 years with the youngest being 10 and the oldest 81.

Patients were divided into seven groups of ten-year age intervals and their inhaler application method was examined. It appears that the proper inhaler application method is different based on age groups and does not follow a specific pattern. While more than half of the patients (58.6%) used the spray properly in the 20-29 age group, in some other age groups less than 50% were using it properly. For example, in the 10-19 age group, 42.9% used the spray properly, and in the age group above 60, the number fell to 32% (Table1)

Table 1: Frequency distribution of patients by inhaler application method and divided by age group

Age group / method	10-19	20-29	30-39	40-49	50-59	60-69	≥70	Total
Correct manner	18 42.9%	34 58.6%	32 37.2%	40 48.8%	40 51.3%	32 34.8%	8 26.78%	204 43.6%
Incorrect manner	24 57.1%	24 41.4%	54 62.8%	42 51.2%	38 48.7%	60 65.2%	22 73.3%	264 56.4%
total	42 100%	58 100%	86 100%	82 100%	78 100%	92 100%	30 100%	468 100%

P=0.014

In the present study, the percentage of correct and incorrect inhaler use was compared between the group of men and the group of women. Of the 204 people who used the spray properly, 114 people (56%) were female.

Patients were divided into five groups in terms of their level of education and were compared against each other with respect to the frequency distribution of correct and

incorrect inhaler use. Patients under study were not distributed normally in terms of their level of education, but the highest percentage of proper inhaler use was observed in patients with primary level education, so that 88 out of the 170 patients surveyed in this group (52%) used the spray properly. This number fell to 42% in patients with a high school degree

and to 37.5% in patients with university education.

Of the 468 patients studied, 336 (71.8%) claimed they had already been trained on proper inhaler use, but only 194 (57.7%) of the trained patients were using the inhaler properly. Of the 132 patients with

no previous training, only 10 (7.6%) were using the spray properly ($P < 0.001$). On the other hand, of the 204 patients using the spray properly, 95.1% were trained; however, of the 264 patients using the spray incorrectly, 53.8% were trained (Table-2).

Table 2: Frequency distribution of patients by inhaler application method and divided by existence or lack of previous training on spray use

Training Method	Yes	No	Total
Correctly	194	10	204
	65.1%	4.9%	100%
Incorrectly	142	122	264
	53.8%	46.2%	100%
Total	336	132	468
	71.8%	28.2%	100%
	100%	100%	100%

$P < 0.001$

Discussion

Correct application of the medication is of utmost importance in treating patients and should be given particular attention. It is simple to use tablets, injections and syrups and merely knowing the right administration time and paying attention to whether or not the stomach should be full will suffice; however, using inhalers for the purpose of improving one's health requires the patient to be informed about proper use instructions in addition to paying attention to the aforementioned points.

The study revealed that of all the patients using this inhaler, 43.6% used it properly and effectively and the rest had issues with its proper use. This issue is not a new one; in fact, specialists have known for 30 years that about half of the patients using inhalers do not use it properly (15 & 16). It was also revealed that, with increase in age, the percentage of people using the inhaler incorrectly increases as well. This condition might be associated with the individuals' ability to comprehend training and their spirit of cooperation. On the other hand, although the difference was not statistically significant, the percentage

of incorrect use was higher in men than in women, which perhaps owes to the greater spirit of cooperation among women than among men. It appears that men do not pay a lot of attention to their condition and do not carefully follow the doctors' instructions. Proper use of inhaler was not related to the level of education. It should be noted that having information about the disease can significantly affect the patients' cooperation for treatment, which is an issue that was also demonstrated in previous studies (17).

Self et al. reviewed more than twenty studies and found out that most physicians and nurses do not have adequate expertise in proper inhaler use (18). This finding indicates that, for proper inhaler use, which is crucial to the treatment of the disease, the patient should be well educated in addition to having been properly trained in person.

Findings of this study indicate that, among the trained patients, 57.7% used the spray properly, while for the untrained patients, this number fell to 7.6%. On the other hand, of the 204 patients who used the spray properly, 95.1% were trained, while of the 264 people who used the spray

improperly, 53.8% were trained. Of the 468 patients examined, 336 (71.8%) were trained on the use of inhalers and the rest were not trained. Due to the high percentage of trained patients, it can be concluded that most physicians and medical health professionals believe that the mere prescription of inhalers is not sufficient and patients should also receive instructions on the proper method of inhaler use based on their age group. In one study, Ebadi et al. emphasize trainings based on visual concept mapping for children (19).

It should be noted that of the 336 individuals trained, 194 (57.7%) used the inhaler properly, perhaps suggesting that a one-time training for proper inhaler use is not sufficient and that it is essential to supervise the patients' inhaler use over several sessions and to repeat the training if necessary. Moreover, it appears that many medical health professionals do not

have sufficient information on proper inhaler use themselves; it is therefore better if they receive the required training first and only then teach their patients the proper, standard method of inhaler use. Some studies have shown that some medical health professionals do not have sufficient information on proper inhaler use and therefore train their patients the incorrectly as well (20) or else do not spend enough time training them the proper method (21).

Conclusion

Results of the present study show that training proper inhaler use is absolutely essential and physicians prescribing inhalers should not only have sufficient information on the device's proper method of application, but should spend enough time training their patients the proper method too.

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