

Comparative study of individual and traditional bedside metered-dose inhaler use and group teaching with video demonstration

Sir,

Several studies have been conducted to evaluate correct metered-dose inhaler (MDI) use among chronic pulmonary patients in Western and Asian countries with purpose to encourage self-care behavior by the patient in all social groups particularly patients with lower economic status.^[1] Introduction of metered-dose medication in the 1970's has improved treatment of chronic obstructive airways disease and asthma.^[2] These medications are prepared in different products including MDI initiated by inhalation, nebulizer, and 5-6 different powder inhaler medications including discus, diskhaler, aerolizer, handihaler, terbuhaler, and twisthaler.^[3] A study with participation of 100 patients with chronic obstructive pulmonary disease has shown that powder inhaler medication initiated by patient inhalation is very popular. Powder inhalers in general have equal efficacy and 5-15% of the inhaled dose settles in the airways. These powder inhalers were introduced in the latter part of 1990's and even though initially taken up by few, they gradually had increased popularity, such that recently the serevent discus, which contains two medications, is simple to use and very common.^[4] Some difficulties with MDI use are: Lack of coordination between inhalation and release of medication, lack of sufficient breath hold during inhalation, too quick an inhalation and lack of awareness when MDI is out of medication or how many doses has been used (Figure 1 shows correct use of MDI). Other factors important in correct learning of medication use are mental status, physical ability, and good coordination. The aero chamber can improve coordination but has its own considerations; too much time between spray and inhalation should not elapse, quick inhalation is required, the chambers' electrostatic charge can cause medication clumping, and multiple sprays for one or two puffs can decrease medication effective dosage delivery. Powder inhalation medications are triggered by inhalation and less coordination between medication release and inhalation

is required by drug preparation and release can be difficult. Due to moisture, the particles of powder can stick to each other and lead to medication wasting, which can be due to moisture in the environment or due to exhaling into the device. Powder inhalers with separately packaged doses for single use are easier to use compared to chambers filled with medication for multiple dosage. A recent review study has been published by committee of European pulmonary specialists and pulmonary care centers on patient MDI use. Specialists report that correct MDI use increases patient awareness and compliance with medication use and following of physician recommendations, which in many studies has shown to improve control of pulmonary disease and patient's overall health.^[5-7] Some studies note that patients can have difficulty in understanding and complying with physician recommendations.^[8] Some studies have shown that 6 month follow-up and self-care teaching in asthmatic patients have not improved patient outcome.^[8-9] Yet, other studies note that even asking patients about questions can motivate them to take more active role in their self-care.^[10] As a result, comparison with control in a randomized case-control study may better evaluate educational methods on any impacts they may have in patient care.

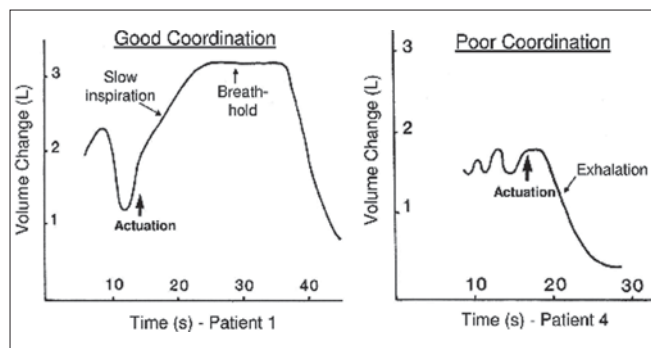
This was a randomized case-control study with participation of COPD and asthmatics in two groups who regularly followed up at the Masih Daneshvari Hospital for pulmonary visit during the year 2008-2010. The control group received personal teaching followed an educational pamphlet. The case group received video teaching in groups of 10-15 individuals within 3 weeks after discharge with repeat teaching in 6 weeks. All participants were evaluated regarding correct use of inhaler medication at start and at 18 months after discharge. Follow-up was by a nurse specialist and phone interview regarding technique of MDI use.

Thirty two patients received traditional teaching and 60 video teaching. In the traditional group, mean age was 53 years old and 20 were male gender. In the video group, mean age was 62 years old and 54 were males. The two groups did not significantly differ in correct explanation of MDI use by phone interview ($P > 0.05$). One person in the traditional group and 5 in the video group did not describe correct MDI technique. Although the two groups did statistically differ in age group and Saint George Respiratory Questionnaire scores at the beginning of the study ($P < 0.004$). Multivariate analysis did not influence incidence of correct MDI use [Table 1].

Patient education is an important part of treatment and

Table 1: Comparison of two methods of traditional and video teaching based on patient characteristics (Independent samples test)

Characteristic	P value
Age	0.003
Number of years with pulmonary condition	0.307
Number of years using MDI	0.137
Saint George Respiratory Questionnaire scores	
Symptoms	0.004
Activity	0.000
Social functioning	0.000
Total	0.000

**Figure 1:** Correct and incorrect coordination with inhalation of medication^[2]

medical care for chronic pulmonary patients and asthmatics particularly in using inhaler medication for symptom control and better pulmonary function.^[5,8,9] Numerous studies in our country and Asian countries such as Singapore and China have been performed that support effectiveness of education in correct medication use.^[1,5-8] Yet, no randomized control trial for asthmatic patients has been done in our country. This study compared to methods of traditional and video teaching of correct MDI use in pulmonary patient in subsequent technique described on phone interview by nurse specialist.

Strength of this study included performing it at a pulmonary specialty center and by nurse specialists. Of points of weakness was lack of personal follow-up at the hospital when requested and need for phone follow-up. In many countries, there is trend toward self-care behavior teaching and awareness of illness exacerbation signs among patients. In a study in China, video teaching and technique demonstration to patients and recurrent assessments has shown increased predicted FEV1 more than 10% in a short time up to a year, which has also shown decreased hospitalization and emergency visits in patients with lower educational and economic status.^[1] In Australia, 7% of adult population has asthma. Studies regarding self-care, awareness of illness, correct MDI, and decreased influence of illness of quality of life have been performed. These studies also have not shown significant influence of age, gender, job, education, and smoking habit. Symptoms began on education.^[5] Similar studies in Iran using MDI and peak flow meter have been

performed. Researchers agree that peak flow meter is not correctly used and patients only pay attention to values after inhaler use. They believe that level of education and length of prescription is important in correct medication use.^[1,5-7] Williams and colleagues showed that patient compliance with corticosteroid MDI use based on patient charts and pharmacy reports in asthmatics has been 50% and is inversely correlated with emergency department visits for acute attack of asthma. If time of running out of medication increases 25%, rate of hospitalization for asthma attack doubles.^[10] Other factors important in compliance are lack of controlled environment and lack of patient follow-up due to economical issues, oral candidiasis with steroid inhalers (that can be prevented with mouth wash after MDI use) and can cause time with total lack of treatment. Even prescribing long-acting MDI may improve compliance. Patient follow-up, education in peak flow meter use or signs of illness exacerbation can help with early visit to physicians.

Although it has been reported that correct MDI use is important in drug delivery to the airways, this study did not refute it but influence of factors such as recurrent teaching, patient motivation, regular follow-ups, and patient self-care education was not assessed. Maybe, video education helped patients with correct medication use. More controlled studies are recommended.

ACKNOWLEDGEMENTS

Researchers would like to thank all colleagues at Masih Daneshvari Hospital that helped with preparation of this article.

Saeid Fallah Tafti, Shoarzargari L., Heydari M., Khayamikia M., Eslami M., Nasiri S., Saliminejad L.

Nursing and Respiratory Health Management Research Center; Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Daar-Abad, Niavaran, Tehran - 19569-44413, Iran

Address for correspondence:

Saeid Fallah Tafti,
Nursing and Respiratory Health Management Research Center;
Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Daar-Abad, Niavaran, Tehran - 19569-44413, Iran.
E-mail: saeid_ftahti@yahoo.com

REFERENCES

1. Abdulwadud O, Abramson M, Forbes A, James A, Walters EH. Evaluation of a randomized controlled trial of adult asthma education in a hospital setting. *Thorax* 1999;54:493-500.
2. Prabhakaran L, Lim G, Abisheganaden J, Chee CB, Choo YM. Impact of an asthma education programme on patients' knowledge, inhaler technique and compliance to treatment. *Singapore Med J* 2006;47:22.
3. Sharifpour A. Clinical evaluation of COPD patient in correct metered-dose-inhaler use. Iran: Mazandaran University of Medical Sciences; 1997.
4. Hasani A, Hosseinpour N. Study of correct MDI use by pulmonary patients in Urmea. Iran: Urmea University of Medical Sciences; 1997.
5. Rahmati H. Evaluation of influence of teaching correct MDI use on

Research Letters

- asthmatics at Shiraz University of Medical Sciences. Iran: Ahvaz University of Medical sciences; School of Nursing and Midwifery; 1997.
6. Miranzadeh Omran H. Patient opinion about MDI use. Iran: Golestan University of Medical Sciences; 1997.
 7. Farhadi K, Atai P. Difficulties with MDI use among asthmatics, bronchial asthma and influence of education. Iran: Kordestan University of Medical Sciences; 2001.
 8. Scherer YK, Bruce S. Knowledge, attitudes and self-efficacy and compliance with medical regimen, number of emergency department visits, and hospitalization in adults with asthma. *Heart Lung* 2001;30:250-7.
 9. Becker MH, Maiman LA. Sociobehavioral determinants of compliance with health and medical recommendations. *Med Care* 1975;13:10-24.
 10. Scherer YK, Bruce S. Knowledge, attitudes and self-efficacy and compliance with medical regimen, number of emergency department visits, and hospitalization in adults with asthma. *Heart Lung* 2001;30:250-7.

Access this article online	
Quick Response Code:	Website: www.jpharmacol.com
	DOI: 10.4103/0976-500X.81904