



Face-to-face Training as an Effective Approach for Instructing Rotahaler Technique in Newly Diagnosed Cases of Asthma and COPD: a Pilot Study

Ramesh Sharma Poudel,¹ Shakti Shrestha,² Rano Mal Piryani,³ Aastha Prajapati,¹ Dipendra Khatiwada⁴

¹Hospital Pharmacy, Chitwan Medical College Teaching Hospital, Chitwan, Nepal, ²Department of Pharmacy, Shree Medical and Technical College, Chitwan, Nepal, ³Department of Internal Medicine, Chitwan Medical College Teaching Hospital, Chitwan, Nepal, ⁴Department of Community Medicine, College of Medical Sciences Teaching Hospital, Chitwan, Nepal.

ABSTRACT

Introduction: This study aimed to evaluate the effectiveness of face-to-face training for instructing rotahaler technique in newly diagnosed cases of asthma and chronic obstructive pulmonary disease (COPD).

Methods: A hospital-based study was conducted on twenty patients who were prescribed rotahaler for the first time. Patients received face-to-face training on rotahaler technique from pharmacist using GINA guidelines. The patients rotahaler technique was assessed after two weeks of training and scored one for correct and zero for incorrect steps. Descriptive statistics was performed.

Results: The mean age of the study population was 48.85±20.49 years. Eleven (55%) patients were females and 13 (65%) were formally uneducated. Fourteen patients (70%) were able to perform all the steps correctly giving overall median score of 8 (7-8).

Conclusions: Face-to-face training seems to be effective approach for instructing rotahaler technique in asthma and COPD patients.

Keywords: *asthma; COPD; face-to-face training; inhaler technique; pharmacist.*

INTRODUCTION

Inhaled medications are the keystone for the treatment of obstructive lung diseases^{1,2} and pressurized metered dose inhalers (pMDIs) and dry powder inhalers (DPIs) are the devices mostly used for delivering the medications to the lungs. However, large majority of the patients were unable to use their dry powder inhalers correctly³ that results in reduced therapeutic effect.⁴ The quality of initial instruction is a foundation for the outcomes of inhalation therapy.⁵ A study by Shrestha et al demonstrated that combination of video and demonstration was useful tool for improving rotahaler technique.⁶ Improvement of inhalation technique not only reduces the frequencies of total as well as nocturnal asthma symptoms but also reduces the frequencies of beta-2 agonist usage.⁴

In Nepal, most of the patients receive only verbal instruction but the effectiveness of face-to-face training approach for instructing rotahaler technique by

healthcare professionals in newly diagnosed patients of asthma and chronic obstructive pulmonary disease has not been explored. Our study may be the first in such setting in Nepal to evaluate the effectiveness of face-to-face training approach for instructing rotahaler technique in newly diagnosed case of asthma and chronic obstructive pulmonary disease.

METHODS

This study was conducted at the outpatient pharmacy of Chitwan Medical College Teaching Hospital from November 2014 to February 2015. Twenty newly diagnosed cases of asthma and COPD who were been prescribed rotahaler device for the first time were

Correspondence: Ramesh Sharma Poudel, Hospital Pharmacy, Chitwan Medical College Teaching Hospital, Bharatpur-10, Chitwan, Nepal. Email: pharmacistsharma23@gmail.com, Phone: +977-9843089582.

selected. Socio-demographic information was obtained and rotahaler technique was instructed through face-to-face training using GINA guidelines (rotahaler specific checklist)⁷ by a registered pharmacist. After two weeks of training, the pharmacist assessed the technique using the same rotahaler specific checklist. Each correct step was scored 'one' and incorrect or missed step was scored 'zero'. Descriptive statistics was performed using SPSS version 20.

RESULTS

The mean age of the study population was 48.85 ± 20.49 years. Eleven (55%) patients were females. Thirteen patients (65%) were formally uneducated and fifteen patients (75%) living in rural areas (Table1).

Table 1. Socio-demographic characteristics of study population.

Sociodemographic characteristics		n (%)
Age in years (mean \pm SD)		48.85 \pm 20.49
Gender	Male	9 (45%)
	Female	11 (55%)
Education	Formally uneducated	13 (65%)
	Primary education	1 (5%)
	Secondary education	5 (25%)
	Intermediate level	1 (5%)
Residential area	Rural	15 (75%)
	Urban	5 (25%)

Table 2. Frequency of correct rotahaler checklist performance.

Rotahaler Checklist		n (%)
Step1: Hold rotahaler vertically		20 (100)
Step 2: Put capsule into square hole		20 (100)
Step 3: Splits capsule into cap and body		20 (100)
Step 4: Breathe out gently		15 (75)
Step 5: Put mouthpiece between lips and teeth		20 (100)
Step 6: Breathe in the powder quickly and deeply		20 (100)
Step 7: Take inhaler out of mouth		20 (100)
Step 8: Hold breath for about 10 seconds		16 (80)
Scores	6	3 (15)
	7	3 (15)
	8	14 (70)

Fourteen patients (70%) were able to perform all the steps correctly. The overall median (IQR) score was 8 (7-8). Five patients (25%) failed to 'breathe out gently' before inhalation and four patients (20%) failed to 'hold breath for about ten seconds' after inhalation (Table2).

DISCUSSION

Incorrect use of inhaler technique is a common problem worldwide. In our pilot study, we analyzed the effectiveness of face-to-face training approach for instructing rotahaler technique. In this study, fourteen

patients (70%) were able to perform all the steps correctly after the training, giving an overall median (IQR) score of 8 (7-8). A study by Shrestha et al in Kathmandu demonstrated that before intervention, only 42.2% of the patients used their inhaler device correctly, and most of the patients overestimated their rotahaler technique despite the incorrect inhaler technique, while 61.1% had never received any previous instruction on the correct use of rotahaler.⁶ Similarly, study done by Graham claimed that 30% of patients had never been demonstrated the correct use of inhaler.⁸ These results suggests that proper training in inhaler technique is lacking in Nepal. Studies have shown that training can lead to more accurate use of dry powder inhalers.^{9,10} Our study, which was led by pharmacist, also suggested that the correct use of rotahaler technique through face-to-face training was nearly 30% better than the percentage depicted by Shrestha et al. A Pharmacist-led intervention study to improve inhalation technique in asthma and COPD patients demonstrated that patients who had never received training in correct inhalation technique made more errors in performing inhalation at baseline than those who have had one or more instruction sessions.¹¹ The patients included in our study were the newly diagnosed cases of asthma and COPD who received the instruction for the first time. Moreover, a study by Cochrane et al showed that patient's education on disease and technique not only improved inhalation techniques but also improved patients compliance to the therapy and lung deposition of drugs.² The incorrect use of the rotahaler device might be a result of inadequate quality and duration of instruction, and inability of reinforcement by lack of follow-up checks up.³ However, we did not reinforce the technique, which could be useful to further improve the correct use of the rotahaler technique from what we have achieved.

In our study, even after training some patient failed to breath out gently before inhalation and hold breath for about ten second after inhalation. Other studies have also mentioned that these are the most common errors while using dry powder inhalers.^{3,6} This emphasize that the reinforcement should focus more on these steps. Furthermore, to ensure that the instructions are correctly provided to patients regarding rotahaler technique, the healthcare professionals should be well educated, trained on rotahaler technique and should have access to demonstration devices. Such approach also improves error detection capability of healthcare professionals.⁴

CONCLUSIONS

Face-to-face training seems to be effective approach for instructing the rotahaler technique in patients with asthma and COPD. However, a larger scale study is necessary, together with regular assessment and reinforcement.

REFERENCES

1. Crompton G. A brief history of inhaled asthma therapy over the last fifty years *Prim Care Respir J*. 2006;15(6):326-31.
2. Cochrane MG, Bala MV, Downs KE, Mauskopf J, Ben-Joseph RH. Inhaled corticosteroids for asthma therapy. Patient compliance, devices and inhalation technique. *Chest*. 2000;117(2):542-50.
3. Lavorini F, Magnan A, Dubus JC, Voshaar T, Corbetta L, Broeders M, et al. Effect of incorrect use of dry powder inhalers on management of patients with asthma and COPD. *Respir Med*. 2008;102(4):593-604.
4. Molimard M, Raherison C, Lignot S, Depont F, Abouelfath A, Moore N. Assessment of handling of inhaler devices in real life: an observational study in 3811 patients in primary care. *J Aerosol Med*. 2003;16(3):249-54.
5. Self TH, Brooks JB, Lieberman P, Ryan MR. The value of demonstration and role of the pharmacist in teaching the correct use of pressurized bronchodilators. *Can Med Assoc J*. 1983;128(2):129-31.
6. Shrestha S, Sapkota B, Ghimirey A, Shakya R. Impact of counselling in inhalation technique (rotahaler) in chronic obstructive pulmonary disease patients. *Int J Pharm*. 2013; 3(3):442-9.
7. Global Initiative for Asthma (GINA) [Instruction for inhaler and Spacer use [online]. (Cited 2014 Oct 7). Available at: http://www.ginasthma.org/local/uploads/content/files/inhaler_charts_2011.pdf.
8. Graham LE. The Ineffective Use of Inhalers in Chronic Obstructive Pulmonary Disease. *J Inst Med*. 2001;23:22-4.
9. Broeders ME, Molema J, Hop WC, Folgering HT. Inhalation profiles in asthmatics and COPD patients: reproducibility and effect of instruction. *J Aerosol Med*. 2003;16(2):131-41.
10. Giner J, Macian V, Hernandez C; Grupo EDEN. Multicenter prospective study of respiratory patient education and instruction in the use of inhalers (EDEN Study). *Arch Bronconeumol*. 2002;38(7):300-5.
11. Hammerlein A, Muller U, Schulz M. Pharmacist-led intervention study to improve inhalation technique in asthma and COPD patients. *J Eval Clin Pract*. 2011;17(1):61-70.

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Journal of Nepal Medical Association,

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