

A STUDY OF INHALER USE TECHNIQUE AMONG PATIENTS OF ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT

OBJECTIVE: To assess the technique of inhaler use among Chronic Obstructive Pulmonary Disease or Asthma patients.

STUDY DESIGN: A Cross Sectional Study

PLACE AND DURATION: Department of Pulmonology, Sheikh Zayed Hospital, Rahim Yar Khan, from 1st March to 30th June 2015.

METHODOLOGY: A total of eighty consecutive patients with diagnosis of chronic obstructive Pulmonary Disease (COPD) or asthma, having history of inhaler use were included. Study subjects were asked to use inhaler while medical officer observed different steps of inhalation as performed by patients. A ten step questionnaire was devised to note inhalation technique by each study subject. Each step of inhalation technique was labeled as "correct" or "false" and noted in questionnaire. The data on demographic variables was also noted.

RESULTS: it was noted that 6% even did not removed cap before use. Majority 87.5% shake inhaler well, whereas, 95% hold upright inhaler properly. According to this study 50% of study subjects did not breath out gently. 32.5% made ineffective mouth sealing and only 37.5% patients breath in while canister was pressed simultaneously, 42.5% continued breath in slowly after canister press and 42.5% hold of breath after canister push. Single actuation/single inhalation was done by only 47.5% of study subjects. Most 52.5% of study subjects also did not wait for one minute if more dose was required.

CONCLUSION: Our study showed that half of the patients were not able to perform the basic essential steps required for effective delivery of drug.

KEY WORDS: Inhaler, Technique, COPD, Asthma, Patients

INTRODUCTION

Asthma and chronic obstructive pulmonary disease (COPD) are prevalent respiratory conditions with overlapping disease characteristics, both of these clinical conditions are characterized by a reduced rate of pulmonary airflow,¹ and airway obstruction is almost reversible in patients with asthma,^{2,3} whereas in COPD is not fully reversible.⁴ Additionally, patients with these diseases may develop acute exacerbations due to increased inflammation of the airway.^{2,5}

The prevalence in younger patients was high in the United States.⁶ Asthma is common in boys as compared to girls. Spirometry is one of the common, practical and reliable, noninvasive test of lung function in establishing the presence and severity of these obstructive airway diseases.⁷

The reason for accurately diagnosing asthma vs COPD is different management approaches for treating these

conditions, but some of the elements of management are similar like life style modification and pharmacotherapy for control of the severity of the condition.^{2,7,8}

The treatment of these diseases ranges from inhaled corticosteroids to anti inflammatory drugs to oral medications. Inhaled corticosteroids (ICSs) to reduce airway inflammation are key to pharmacotherapy for treatment of persistent asthma.² Studies showed that clinical effectiveness is good for different inhaler devices in the delivery of inhaled corticosteroids and beta2-bronchodilators for patients with asthma and COPD; however there was lack of focus on individual technique failures.⁹ Chronic Obstructive Pulmonary Disease and Asthma are one of the major public health problem faced by patients in our area, resulting in poor quality of health. Most of the patients are advised inhalers for asthma and COPD management and control.^{9,10} Patients spend money for treatment that itself is not effective because of poor technique of using inhalers for controlling and managing the disease. This puts a lot of financial burden on patients and is useless in terms of outcome, because poor technique leads to practically low dose of drug delivered to the site of action, so this study was planned to assess the technique of inhaler use among Chronic Obstructive Pulmonary Disease or Asthma patients attending Pulmonology Out patient department of Sheikh Zayed Hospital Rahim Yar Khan, so that appropriate suggestions may be recommended for improvements.

The objective of our study was to assess the technique of inhaler use among Chronic Obstructive Pulmonary Disease or Asthma patients.

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METHODOLOGY

RESULTS

This was a cross sectional study, conducted in Department of Pulmonology, Sheikh Zayed Hospital, Rahim Yar Khan, from 1st March to 30th June 2015. A total of 80 consecutive patients with diagnosis of Chronic Obstructive Pulmonary Disease (COPD) or asthma, having history of inhaler use were included. The patients with age 15 years or above were included in study. The patients who did not gave consent and with other chronic diseases like DM, renal or hepatic diseases were excluded from study. Informed verbal consent was taken from each study subjects and permission from Institutional Review Board was sought. The study subjects were asked to use inhaler while medical officer observed different steps of inhalation as performed by patients. A ten step questionnaire was devised to note inhalation technique by each study subject. Each step of inhalation technique was labeled as “correct” or “false” and noted in questionnaire. The step of inhalation technique noted during use of inhaler included; removing cap of inhaler, shaking well before use, holding upright, breath out gently before use, effective mouth seal, simultaneous inspiration (breath in) and pushing canister, continue breath in slowly after pushing canister, holding breath, single actuation single inhalation and waiting for one minute before next. The data on demographic variables was also noted. Frequency of correct response to each step was presented as percentage. Data was entered and analyzed by suing SPSS version 16.

This study was conducted that to assess the inhaler use technique among patients of COPD and Asthma patients, with 80 study subjects were included. It was noted that 52 (65%) study subjects were illiterate. (Table - I)

It was noted that 24 (30%) were house wives, 34 (42.5%) laborer, 10 (12.5%) were office workers, 10 (12.5%) self employed and 2 (2.5%) were students. It was noted that 8 (10%) have history of inhaler use in family and 54 (67.5%) had received some training for inhaler use. Regarding disease for which inhaler was prescribed it was noted that 56 (70%) have Asthma whereas, 24 (30%) COPD.

Figure 1, shows that majority 75 (93.7%) of patients removed cap, while 5 (6%) even did not removed cap before use. Majority 70 (87.5%) shake inhaler well, whereas, 76 (95%) hold upright inhaler properly. According to this study 40 (50%) of study subjects breath out gently and fifty percent did not. 26 (32.5%) made ineffective mouth sealing, among 30 (37.5%) patients breath in while canister was pressed simultaneously, 34 (42.5%) continued breath in slowly after canister press and 34 (42.5%) hold of breath after canister push. Single actuation/single inhalation was done by 38 (47.5%) of study subjects. Most 42 (52.5%) of study subjects also did not wait for one minute if more dose was required.

TABLE - I: EDUCATIONAL STATUS OF STUDY SUBJECTS. (N=80)

Education	Frequency	Percent
Illiterate	52	65
Primary	16	20
Matriculation	10	12.5
Intermediate	2	2.5
Total	80	100

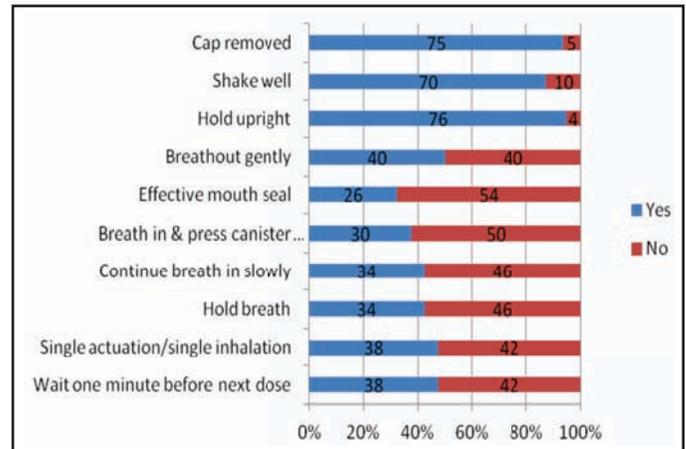


FIGURE - 1: STEPS OF INHALER TECHNIQUE AS PERFORMED BY STUDY SUBJECTS.

DISCUSSION

This study was conducted to assess the use of inhaler by patients of Asthma or COPD, by a questionnaire having ten questions related to various important steps regarding inhaler use. Inhalation technique in COPD patients without face-to-face training was mostly unsatisfactory, especially in patients with low education levels. The Hand inhaler was the inhaler device associated with the lowest technique failure. Face-to-face inhalation technique training significantly increased technique compliance for the pMDI.¹¹ In a previous study, the rate of correct usage was 58.9% for dry powder inhalers (DPI) and 31.1% for pressurized metered dose inhalers (pMDI) before the training.¹² In current study, none of the patients performed all steps of inhalation technique correctly, interestingly 6% of study

subjects did not even removed cap of inhaler before use. This may be due to lack of knowledge, old age or fear of observation on part of patients. In another study, overall, 40% of the patients made at least one essential mistake in their inhalation technique. Comparison between devices showed that a correct inhalation technique most likely occurred with the use of prefilled dry powder devices.¹³

In another study,¹⁴ incorrect handling techniques of inhaler device usage were high among Chinese COPD patients. Step 8 ("Inhale forcefully from the beginning, slowly, deeply, and uniformly during the inspiratory phase until the lungs are full") was the most commonly mishandled step (93.8%). In contrast, in current study concerning this important step, we found that 34 (42%) correctly performed this step, while majority 46 (58%) did not performed this step correctly. Effective mouth seal was not

performed 54 (67%) of patients in our study. The total score and individual step scores of the patients from the observation group were significantly improved during 3-day continuous education. There was also a significantly higher percentage of correctly performed steps in the observation group than in the control group upon assessment on day 10 (96.24% vs. 85.63%, respectively; $p < 0.01$), day 20 (97.31% vs. 86.09%, respectively; $p < 0.01$), and day 30 (98.19% vs. 87.39%, respectively; $p < 0.01$). Another error in handling of inhaler was that 10 (13%) did not shake well inhaler before use. Handling errors of the Diskus 13-step inhalation procedure were commonly observed in Chinese COPD patients. Continuous educational interventions and regular supervision by health-care providers are therefore crucial for the optimum use of the Diskus inhaler.¹⁴

Our study showed that half of the study subjects were not able to perform the basic essential steps required for effective delivery of drug. We found that about some of study subjects did not even hold the inhaler properly; some of the subjects not removed the cap. Half of the study subjects did not breathe out or exhaled properly. 1/3 of the subjects did not make effective mouth seal and not pressed canister while breathing in simultaneously. We found that majority of patients were pre trained regarding the use of inhaler, male, illiterate and labourers by profession.

CONCLUSION

Our study showed that half of the patients were not able to perform the basic essential steps required for effective delivery of drug.

Contribution of Author:

Ghulam Mustafa: Idea conception, data analysis, report writing
Ibrahim Khan: Report writing, data collection, data entry
Khalil Ahmed Shahid: Idea conception, report writing, literature review,
Hafiz Mohammed Yar Malik: Idea conception, review

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