

Original Research Paper**Assessment of inhaler device preference and inhaler technique in Asthma and Chronic Obstructive Pulmonary Disease**

Authors:

¹Dr. Suhail Neliyathodi, Professor and HOD, ²Dr. Vineeth A.k, Resident^{1,2}Department of pulmonology, MES Medical College, Malappuram, Kerala, India

Corresponding Author: Dr. Suhail Neliyathodi Professor and HOD, Department of pulmonology

Article Received: 07-08-2022**Revised:** 26-08-2022**Accepted:** 17-09-2022**ABSTRACT:**

Background: The delivery of drugs by inhalation is an integral component of asthma and chronic obstructive pulmonary disease management. However, even with effective inhaled pharmacological therapies, the disease remains poorly controlled around the world. The reasons for this are manifold, among them the important being, poor patient education and poor inhaler technique. In this study, patient inhaler preference and proper inhaler technique will be assessed. **Methods:** A cross sectional study was conducted in patients coming to MES medical college during 1st January 2019 to 31st December 2019 with a diagnosis of COPD/Asthma and receiving inhaler mode of therapy. The inhaler technique of patient's device as well as preference for other available inhaler devices was evaluated. Data were entered into MS excel and analysis were done using SSPS® software version 23. **Results :** Total of 226 patients enrolled into the study. The rate of wrong steps was higher in MDI without spacer (50.17%) group. The rate of wrong steps in the male population was 56% which was lesser when compared to female population which was as high as 71% and this was statistically significant $p = 0.045$. The rate of wrong steps was higher in the older population more than 60 years (78%) than in younger population (52%). Turbuhaler, Diskus & Synchronbreathe was preferred by 82.30% over the current inhaler device followed by MDI without spacer (10.18%), Revolizer, Lupihaler & Rotahaler (7.52%). **Conclusion:** A significant proportion of patients are practicing wrong inhaler technique. Wrong inhaler technique is more frequent in older age group and in female patients. Turbuhaler, diskus and synchronbreathe was preferred by majority over the current inhaler device.

Keywords: *Inhaler preference, Inhaler technique, Patient education, Turbuhaler*

INTRODUCTION:

Chronic obstructive pulmonary disease (COPD) and asthma are common diseases with a heterogeneous distribution worldwide. Asthma was the most prevalent chronic respiratory disease worldwide in 2015, with twice the number of cases of COPD. Deaths from COPD were eight times more common than deaths from asthma. In 2015, COPD caused 2.6% of global DALYs and asthma 1.1% of global DALYs. ⁽¹⁾The delivery of drugs by inhalation is an integral component of asthma and COPD management. However, even with effective inhaled pharmacological therapies, asthma and COPD remains poorly controlled around the world. The reasons for this are manifold, among them the important being, poor patient education and poor inhaler technique. To understand how to improve the use of inhalers, different aspects have been studied, such as types of devices, patient factors (age, gender, education) and patient preferences. Yet, research results regarding the interaction between patient, device and technique are insufficient and inconsistent. The present study is planned in the state of Kerala where the incidence of asthma and the COPD have increased over the years. We had noticed that when the technique was

demonstrated when the inhaled therapy was instituted, the compliance was better. Hence, we decided to study if the information was provided, did it have any effect on the control of asthma, and if the patient was given the choice of choosing therapy which type would they choose. In this study, patient inhaler preference and proper inhaler technique was assessed. This information we gather in this study would be important for clinicians in the future to decide about mode of delivery of drugs and patient compliance for them. It will also shed light on the need for instructing patients on correct inhaler technique.

METHODS

This study was a cross-sectional study performed in Department of Respiratory Medicine, MES Medical College, Perinthalmanna, Kerala involving 226 COPD & Asthma patients. The study was conducted over a period of one year.

Inclusion criteria: all Asthma and COPD patients attending the out patient clinic of MES Medical College, Perinthalmanna.

Exclusion criteria: All patients less than 18 years, Patients with coexisting lung pathologies, Patients who can only use a specific inhaler device Each patient was enrolled and after obtaining a written informed consent

from the study subject and assuring of maintaining confidentiality, a pre-structured and pretested questionnaire was used to gather information. Each participant is asked to show the interviewer how he/she usually uses the inhaler(s) currently prescribed. They were asked to demonstrate the way they use the inhaler device. All the steps were noted down and the number of steps failed will be noted. Thus, inhaler technique for patient's device were evaluated through observation. The interviewer registered each step whether it was performed properly and in an adequate order. After the assessment of the inhaler technique, the interviewer will explain the correct inhaler technique for the participant's device (s) and demonstrates how to use the remaining inhalers. After

the explanation and demonstration of use, each participant has the opportunity to test the available inhalers by him/herself. The patients were evaluated after the demonstration to determine which inhaler device is perceived as the easiest and considered suitable for daily use by the scores obtained.

Data analysis: Data was analyzed using SPSS® software version 23. Tests of significance for normally distributed quantitative variables were independent sample test and one way ANOVA and for non-normally distributed quantitative variables were Mann Whitney U test and Kruskal Wallis test. Fischer's exact test and χ^2 test were used for qualitative variables. P less than 0.05 was considered statistically significant

RESULTS

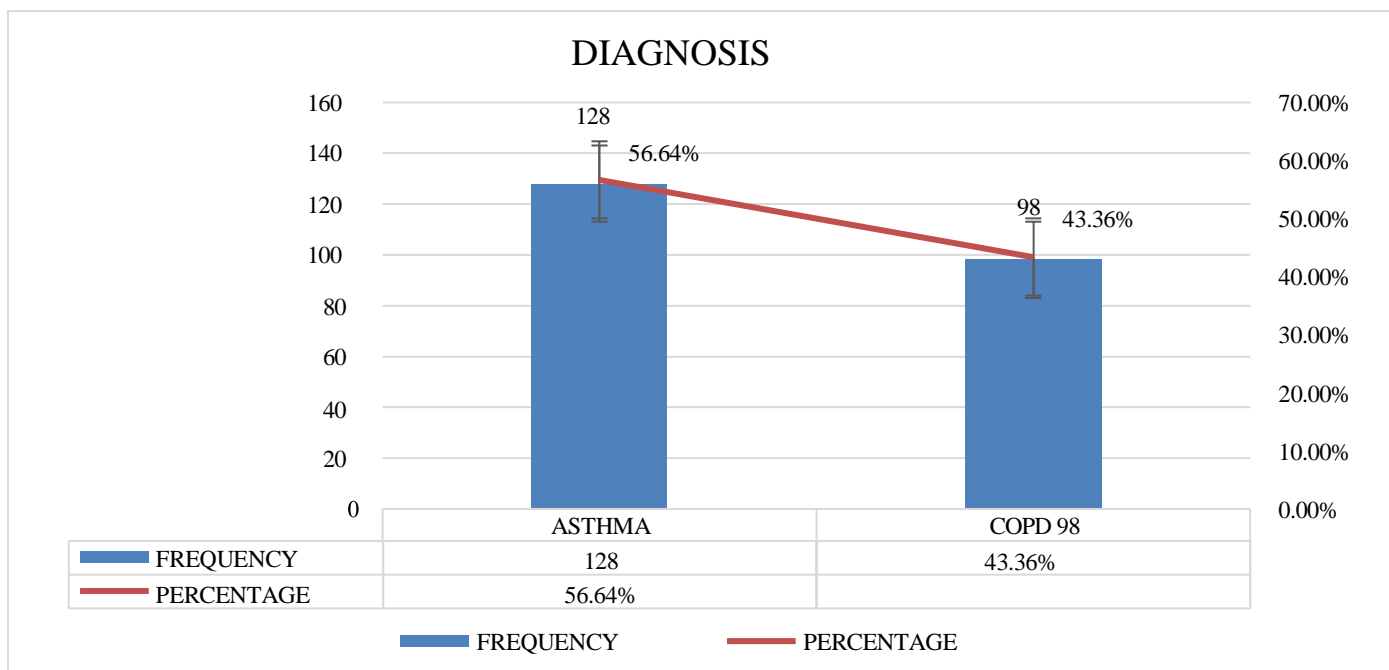


Figure1

The present inhalers that were tried were as follows: revolizer, lupihaler, rotahaler in 213 (94.25%), turbuhaler, diskus, synchrobreathein 9(3.98%) and MDI without spacer in 4(1.77%).

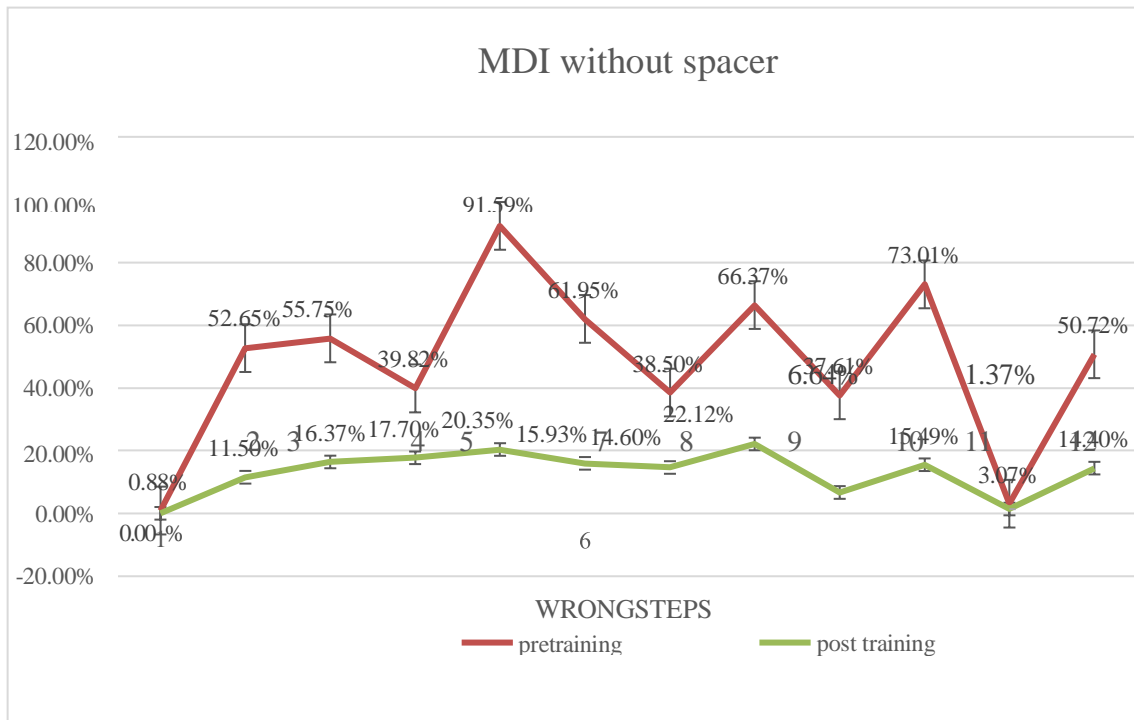


Figure 2: MDI Without spacer–Wrong steps
 There was a significant difference in all the parameters pre and post training with a p value < 0.05

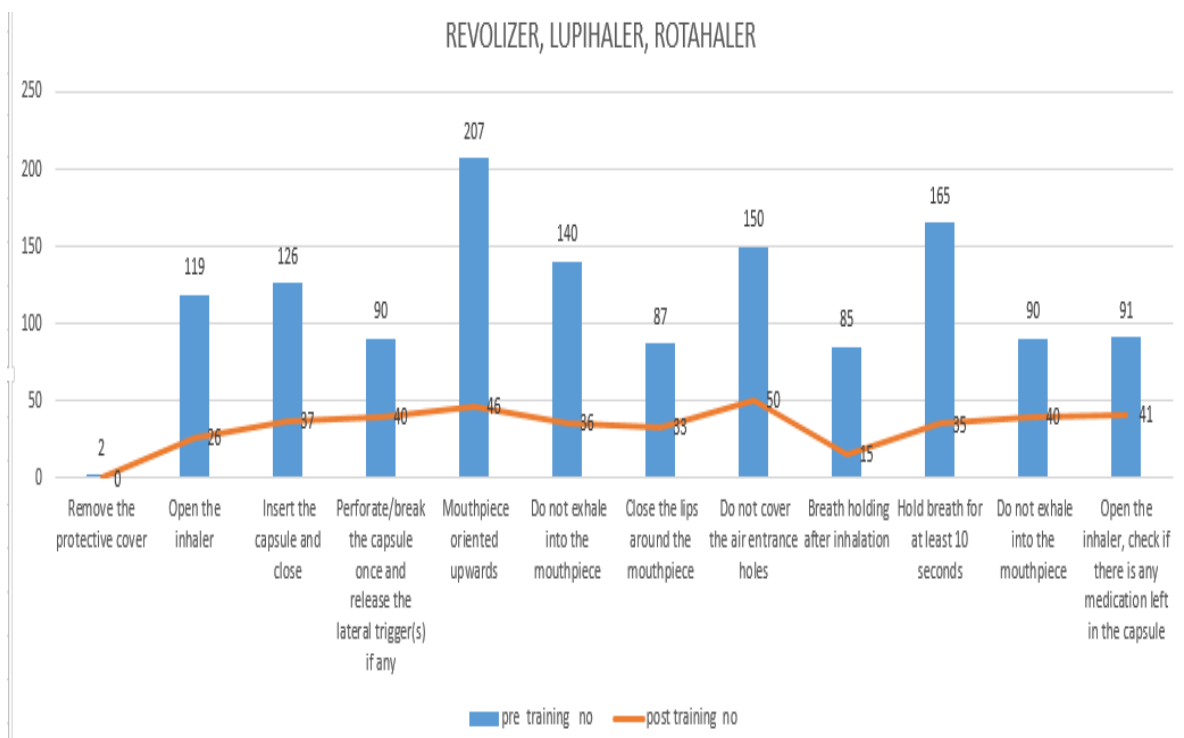


Figure 3: Revolizer, Lupihaler, Rotahaler–Wrongsteps
 There was a significant difference in pre and post training with a p value < 0.05

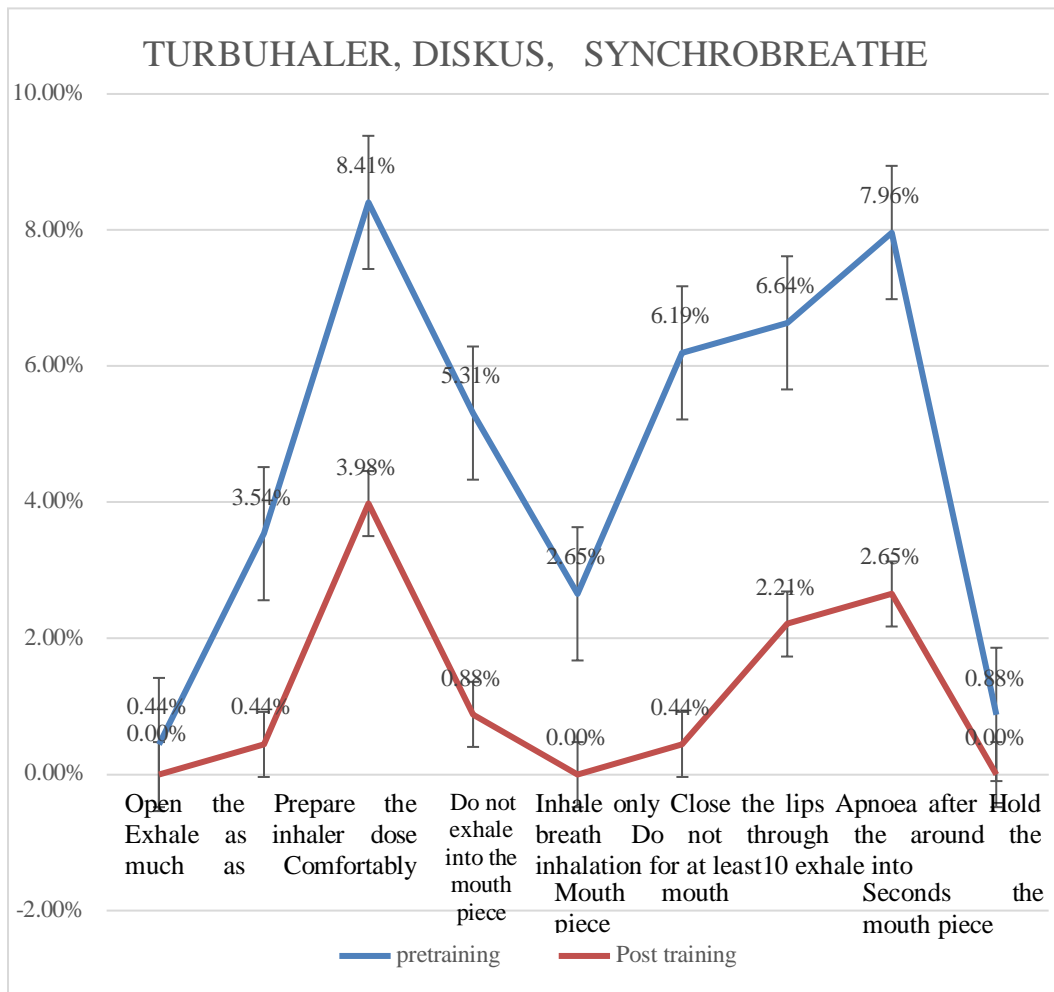


Figure 4: Turbuhaler, Diskus, Synchrobreathe
 There was a significant difference in all the parameters pre and post training with a p value < 0.05

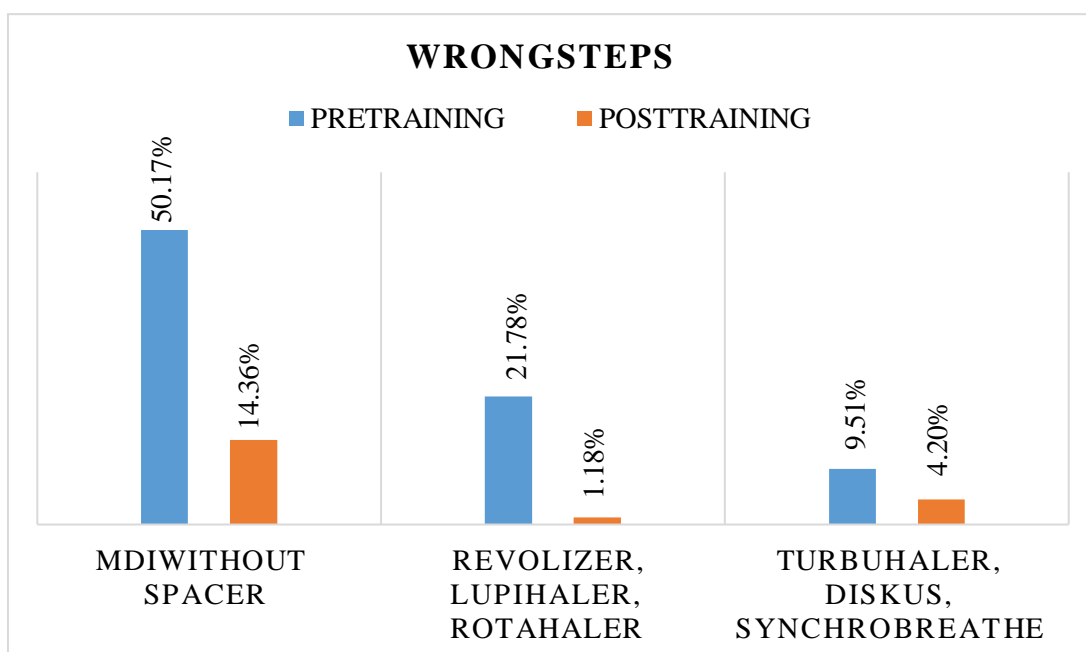


Figure 5: Wrong Steps

There was a significant difference in all the three sub groups pre and post training with a p value < 0.05

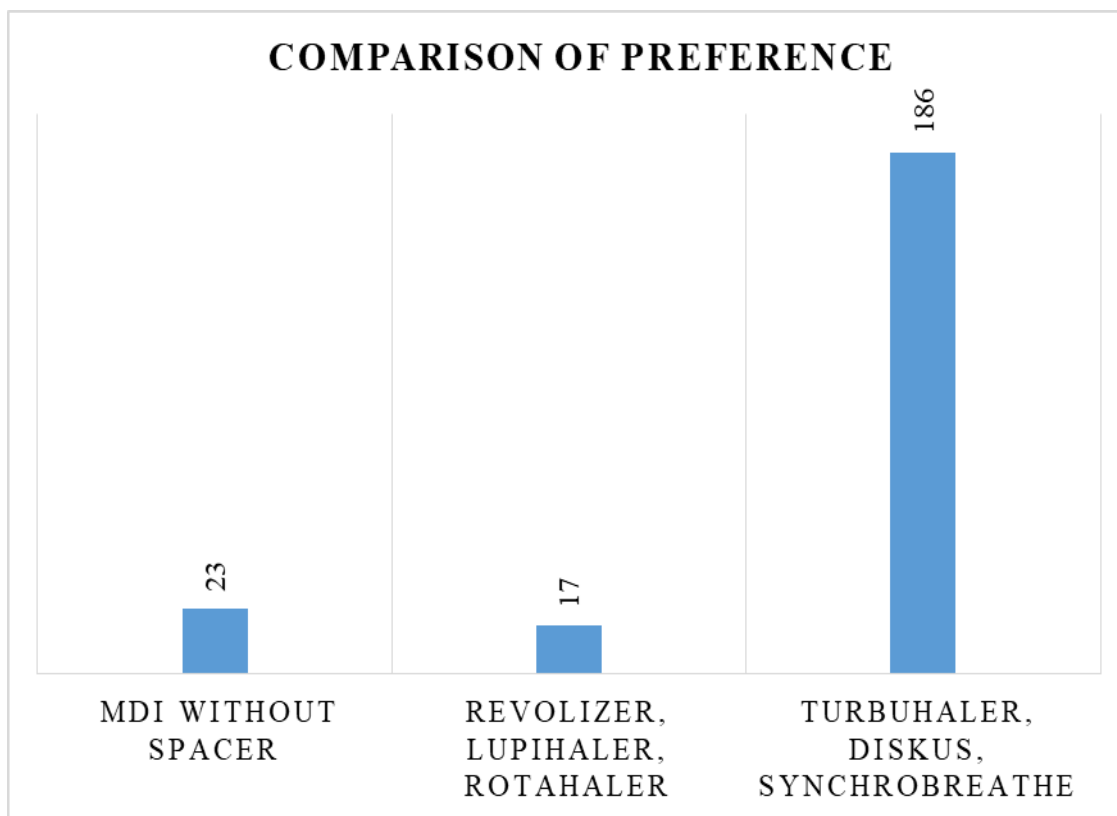


Figure 6: Comparison of preference

MDI without spacer was preferred by 10.18% , REVOLIZER, LUPIHALER, ROTAHALER by 7.52% and TURBUHALER, DISKUS, SYNCHROBREATHE by 82.30% (chi square p <0.001).

DISCUSSION:

Among the diseases that contribute towards the respiratory morbidity, COPD and asthma are considered as the commonest diseases ⁽¹⁾.The prime pathology of both COPD and asthma is the limitation of air flow and hence use of inhaled medications is the most important method in their management^(2,3).With the advances that have occurred in the field of medicine and technology there is an array of inhaled therapy devices that are available for use ^(4,5).In the present study we noted improvement in the knowledge scores of the technique of inhalation following education, this is similar to the study at Korea done by Lee et al⁽⁶⁾that was done on cohort 43 test group and 36 control group of asthma patients they noted that following education for inhaler use there was a significant improvement in the scores of knowledge inhalers and the technique of inhalation. In a study on interns they found that prior to teaching only 5% knew the proper method to use MDI. This increased significantly to 13% following a lectured emonstration and to 73% following a one to one training session and the study concluded that all the medical staff that come for training have limited knowledge and ability to use MDI method without spacers ⁽⁷⁾. We noted the

following; as participants inclusion criteria were broad and based on diagnosis of COPD and asthma, they had different experience with inhaled therapy. Moreover, we comprehensively assessed factors that was previously described separately like type of inhaler device, patient preferences and demographic characteristics. We included 7 different inhaler devices which is fair enough to be assessed simultaneously in a similar study setting. This study has also some limitations, we were unable to compare all device for incidence of wrong steps. In our study, the incidence of wrong steps was higher in MDI without spacer (50.17%).In male population the rate of wrong steps was lesser (56%) than the female population (71%) and this was statistically significant p= 0.045 chi square. The rate of wrong steps was higher in the older population more than 60 years (78%) than in the younger population(52%). On questioning they stated that when they used the device, they sought to media plat form and videos to use the device. A comparative study by Anderson P found out Turbohaler and Diskus were the preferred device when overall preference was assessed. An observational study by Ding Betal concluded that a high proportion of physicians had no preference for the inhaler type, irrespective of the

disease state, and when preferences were stated, there was no clear consensus on a particular device type. For patients, the most important attribute of an inhaler was that its instructions were easy and simple to follow. This hospital based study implies that a significant proportion of patients are practicing wrong inhaler technique. Wrong inhaler technique is more frequent, especially in older age group and in female patients. The simplest steps like breath holding following inhalation were not present in most cases across all groups, this needs to be done correctly as it is the time the drug actually gets deposited in the lungs. Following teaching sessions regarding the need and proper inhalational method, all parameters improved as they understood the need of each step. Turbuhaler diskus and synchrobreathe was preferred by majority over the current inhaler device followed by MDI without spacer. Also many people opted for Turbuhaler and diskus following training session, as it was easy to use, carry and looks attractive.

CONCLUSION:

A significant proportion of patients are practicing wrong inhaler technique. Wrong inhaler technique is more frequent in older age group and in female patients. Turbuhaler, diskus and synchrobreathe was preferred by majority over the current inhaler device.

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