https://umedpress.com

Global Journal of Integrated Medical and Health

Vol 1, Issue 1, 2025

A Study to Assess the Knowledge, Attitude, and Practice of Inhalational Therapy among Patients with Obstructive Airway Disease Attending a Tertiary Care Hospital

Dr G. K Balaji[1*], Dr Roshan Kumar[2], Dr Pajanivel[3]

[1]Assistant Professor, Department of Respiratory Medicine, Stanley Medical College, Chennai, India

[2]Assistant Professor, Department of Respiratory Medicine, Stanley Medical College, Chennai India

[3]Professor, Department of Respiratory Medicine, Mahatmagandhi Medical College, Pondicherry, India

Correspondence details: Dr G. K Balaji, Assistant Professor, Department of Respiratory Medicine, Stanley Medical College, Chennai, India

Email - balajigk7@gmail.com

ABSTRACT

BACKGROUND: Incorrect usage of inhaler devices might have a significant influence on the clinical effectiveness of the drug delivered. This issue is poorly addressed; hence, the study was designed to investigate the knowledge and ability of the healthcare professional student community to use inhaling devices. Poor inhalation techniques are associated with decreased medication delivery and poor disease control in chronic obstructive pulmonary disease (COPD) **AIMS AND OBJECTIVES**: To study knowledge, attitude, and practice of inhalation therapy among obstructive airway disease patients. **METHODS:** This cross-sectional study was done in the outpatient Pulmonary medicine department in Mahatma Gandhi Medical College and Research Institute, Pondicherry. From 2013 to 2016. All patients with history and symptoms suggestive of obstructive airway disease attending the Pulmonary Medicine outpatient department will be included in the study. A patient who is already on inhalation therapy will be screened and their knowledge will be assessed and their attitude and practice of using inhalation therapy will be checked using structured pre-validated questionnaire. **RESULTS:** About 74% preferred the use of inhalers in asthma. However, about 43% liked to use oral medications more than inhaled medicines. About 55% believed that inhaled medications contain a higher dose than oral. About 76% of patients believed that they need to continue inhalers life- long once started. Although 54% claimed to use inhalers regularly, only 29% used to bring their device for follow-up assessment, while 33% admitted that they don‟t know how to use their inhaler properly**. CONCLUSION:** Inhalation technique in COPD patients without face-to-face training was mostly unsatisfactory, especially in patients with low education levels. The Handihaler was the inhaler device associated with the lowest

technique failure. Face-to-face inhalation technique training significantly increased technique compliance for the pMDI.

KEYWORDS: chronic obstructive pulmonary disease; compliance; inhalation; technique.

INTRODUCTION:

Asthma and chronic obstructive pulmonary disease (COPD) are the common obstructive airway diseases that are the leading cause of mortality and morbidity worldwide. Inhalation therapy evolved and developed over the last 50 years is and will remain for the near future as the cornerstone of asthma and COPD management.[1]The aim of inhalation therapy in asthma and COPD is to reverse and prevent airway inflammation and constriction and to minimize disease symptoms.[2]Inhalation therapy in which drugs are delivered in various doses as aerosols has been recommended as the mainstay of treatment for patients with asthma and COPD by various international guidelines. The National Heart, Lung and Blood Institute (NHLBI), World Health Organization (WHO) Global Initiative for Chronic Obstructive Lung Disease (GOLD), and Global Initiative for Asthma (GINA) recommend that bronchodilator medications are central to symptom management in COPD and asthma patients in which inhaled therapy is preferred. [3]Inhalation drugs are preferred for the treatment of asthma and COPD due to their high therapeutic index. These drugs are directly delivered to the airways, producing higher local concentrations and a lower risk of systemic side effects.[4]The inhalational drugs used in the management of obstructive airway disease are directly delivered to the airways through three main delivery devices: metered-dose inhalers (MDI), dry-powder inhalers (DPI), and nebulizers (in exacerbations and emergencies)The deposition pattern of the inhaled drug in the respiratory tract is determined by a complex interaction between the device, the aerosol formulation and the patient's inhalation technique[5]. A large proportion of patients prescribed inhaled medications do not use their inhalers correctly. This leads to decrease drug delivery, patient adherence. to the treatment regimen, and drug effectiveness. Overall up to 90% of patients show incorrect technique in clinical studies with either standard pressurized metered-dose inhalers (pMDIs) or dry-powder inhalers (DPIs) with higher rates of errors in children and old patients.[6]The high prevalence of incorrect inhaler techniques by patients has been explained by several factors, one of the most common is healthcare providers do not spend sufficient time educating patients on the correct use of the inhalers Another factor is the lack of regular periodic assessment of patients' inhaler technique, essential to ensure proper use [7]

METHODS: This cross-sectional study was done in the outpatient of the Pulmonary medicine department in Mahatma Gandhi Medical College and Research Institute, Pondicherry. From 2013 to 2016. All patients with history and symptoms suggestive of obstructive airway disease attending the Pulmonary Medicine outpatient department will be included in the study. Patients who are already on inhalation therapy will be screened and their knowledge will be assessed and their attitude and practice of using

inhalation therapy will be checked using a structured prevalidated questionnaire. Inclusion Criteria The following patients were enrolled for the study: 1. Known cases of asthma 2. Those with age between 15 to 60 years 3. Those who know inhalers as one of the modalities of asthma treatment 4. Those who are willing to take part in the study and to sign informed written consent Exclusion Criteria The following patients were excluded from the study: 1. Those below the age of 15 or above 60 years 2. Those who had not heard of inhaled medications in the management of asthma 3. Those who are unwilling to participate in the study.

STASTICAL ANALYSIS: All data will be entered into a Data Collection Proforma Sheet (Appendix 1) and entered into Excel (MS Excel 2011). Privacy and Confidentiality to be maintained. All patient identifiable numbers and information should be stripped and replaced by anonymous numbers. Compliance for each step of inhaler technique was determined, expressed as a proportion, mean score, and association between satisfactory performances and co-variable was assessed using Chi-square test.

RESULTS

TABLE :1 AGE DISTRIBUTION

Age group (Years)	Male	Female	Total
15-30	20 (15%)	20 (15%)	40
31-45	20 (15%)	11 (7%)	33
46-60	10(20%)	18(12%)	28
Total	50 (100%)	50 (100%)	100

Table:1Average age was 43.40 years. About 65(63%) were residing in a rural area. male & female ratio was equal. The maximum age group was between 15-60.

2. DEMOGRAPHIC DETAILS

Parameter		Number	Percentage
Residence	Urban	70	37
	Rural	120	63
Smoking	Non smoker	102	54
	Smoker	33	17
	Ex-smoker	55	29
Education	Illiterate	51	27
	Primary	82	43

	Secondary	41	22
	Graduate	16	8
Duration of use	<1 year	64	34
	1-2 years	62	33
	2-3 years	35	18
	>3 years	29	15

Table:2 Average age was 43.40 years. About 120 (63%) were residing in rural areas. Majority were non-smokers (54%, n=102). Most of the patients had primary school-level education status only. Most of the subjects used inhalers for less than 1-year duration.

TABLE :3 ATTITUDE AND PRACTICE OF INHALATIONAL THERAPY

Question	Yes		No	
	Number	Percentage	Number	Percentage
Are you aware that you are suffering from asthma?	133	70	57	30
Do you consider inhalers as a choice for asthma treatment?	141	74	49	26
Do you prefer oral medication over inhalers?	82	43	108	57
Are you aware that different medications are available in the inhaled form?	74	39	116	61
Do you know the amount of medication in inhalers are less compared to tablets?	85	45	105	55
Do you think inhalers are addictive?	72	38	118	62
Do you think inhalers have side effects?	40	21	150	79
Do you consider inhalers should be reserved for serious illness?	78	41	112	59
Do you think once started inhalers have to be taken life long?	144	76	46	24
Do you feel ashamed or embarrassed to use inhalers in front of others?	63	33	127	67

Do you find inhalers costlier than oral medications?	87	46	103	54
Do you use your inhaler regularly?	103	54	87	46
Do you wish to change the type of inhaler you use?	55	29	135	71
Do you carry your inhaler to the doctor's clinic during all your visits?	55	29	135	71
Do you think that you know how to use an inhaler correctly?	127	67	63	33

Table :3 About 74% preferred the use of inhalers in asthma. However, about 43% liked to use oral medications more than inhaled medicines. About 55% believed that inhaled medications contain a higher dose than oral. About 76% of patients believed that they need to continue inhalers life- long once started. Although 54% claimed to use inhalers regularly, only 29% used to bring their device for follow-up assessment, while 33% admitted that they don‟t know how to use their inhaler properly.

DISCUSSION

Optimal inhaler technique allows maximal drug delivery to the lungs, improving the therapeutic benefit and leading to improved symptom control, such as reduced frequency of nocturnal symptoms, and cough[8]. From clinical practice as well as from observational studies, however, it is evident that a poor pressurized metered-dose inhaler (pMDI) technique leads to poor treatment responses. Inadequate inhaler instruction and poor inhaler technique are other major causes of poor disease control, influencing as they do the amount of drug that reaches the lung and compliance with therapy.[9]Consequences of poor pMDI technique include a decrease in pulmonary deposition, with a concomitant reduction in bronchodilator effect. Treatment failure in patients with asthma or COPD can occur due to incorrect use of inhaled medications resulting from various factors, such as lack of counseling, inadequate counseling, and learning styles of patients.[10]The pMDI is still the most frequently prescribed inhaler device worldwide even though most patients cannot use it correctly, this is because pMDIs require good coordination of patient inspiration and inhaler activation to ensure correct inhalation and deposition of drug in the lung. A study of pMDI use in a group of 115 asthmatics showed that 72% of patients who received no instruction were unable to use their pMDI correctly compared with 48% after physician training.[11] An earlier study done by Giraud V et.al among patients of obstructive pulmonary diseases and in the general population had shown that only 15.1% of patients and 17.2% general population considered inhalers as the preferred mode of treatment.[12]

In a study by Sulaiman et al[8] in 2017, 52% of the study subjects preferred inhalational therapy(male-68%, female-35%). Thus the general acceptability for inhalers varies considerably among different populations. A large of the patient population had a stigma on using inhalers and chose oral medication. Their reasons included inhibitions for inhaler use in public, preference to keep the inhaler use as a secret, need for a smaller inhaler device, and the belief that inhalers were used for severe diseases and once started on, inhalers had to be taken life-long as it becomes a habit. This fact was more among females, similar to the finding in the study.[13] A Spanish study in patients, nurses, and physicians (n ¼ 1640) showed that 91% of patients were unable to use their pMDI correctly compared with 85% and 72% of nurses and physicians, respectively. People with asthma and poor inhaler technique were shown to have poorer symptom control compared to those with good inhaler technique (31% versus 19%), with a subsequent increase in medical or emergency visits. [14] A study conducted in India reported that 64% of adults suffering from respiratory diseases and prescribed metered dose inhalers (MDIs) used them incorrectly while 25.9% of adults with respiratory diseases who were prescribed retailers used them incorrectly[15] In a study by Lindgren S, et.al noticed that inhaler technique was worse in those subjects who did not have patient education regarding inhaler technique (66.5% versus 86.4%, $p<0.0001$)Patient education is considered an important factor regarding inhaler technique in literature, and verbal instruction is considered to be more effective than written instruction. A systematic review of studies measuring compliance with inhaled corticosteroids, measuring inhalation techniques with different inhalation devices, and estimating the proportion of the inhaled drug that is deposited in the lung showed varying rates of correct inhalers technique or various devices in the studies included.[16] Mickle TR et al in his study showed among MDI users the factors with a statistically significant association with poor inhalation technique are prescription of the inhaler by a nonpulmonologist, treatment initiation at a hospital that is not specialized in Pulmonary Medicine, and training of inhaler technique by a person other than the doctor In our study, patients under-taking regular doctor visits were also found to be taking inhaler regularly ($P < 0.05$). However, these positive practices did not translate into satisfactory inhaler performance either. It should be emphasized that about 71% of patients were not having a habit of carrying their inhalers devices along with them during routine check-up visits. And about 33% confessed that they are unsure whether they are using their inhaler properly or not.[17] Without a doubt, a good number of patients will be found to have poor inhaler technique is assessed objectively. Clinicians need to counsel the patient to bring their inhalers routinely for reassessing their technique, to correct the flaws. This attempt will ensure a better drug delivery and improved treatment outcome, further enhancing the patient‟s compliance to inhalers.[18,19,20]

CONCLUSION

Many diplomats, expats, and economically upward citizens residing in Puducherry have started installing 'air-purifiers (in addition to air-conditioners) at their residence to circumvent the current critical situation. To conclude, within the limitations of the hospital-based study, most patients (75%) with asthma and COPD are not using their inhalers correctly. On a parallel note, there is also a high concomitant sensitization/training need for the doctor on correct steps for inhalation technique. Proper training, compliance, and demonstration of inhalation techniques by patients on first and repeat clinic visits would boost morale and also lead to correction of deviant practices.

REFERENCES:

1. Al-Jahdali H, Ahmed A, Al-Harbi A, Khan M, Baharoon S, Bin Salih S, et al. Improper inhaler technique is associated with poor asthma control and frequent emergency department visits. Allergy Asthma Clin Immunol Off J Can Soc Allergy Clin Immunol. 2013;9(1):8.
2. Barthwal MS, Deoskar RB, Rajan KE. Status of inhalation therapy in bronchial asthma in adults above twelve years of age in armed forces. J Assoc Physicians India. 2005; 53: 681-4.
3. Brocklebank D, Ram F, Wright J, et al. Comparison of the effectiveness of inhaler devices in asthma and chronic obstructive airways disease: a systematic review of the literature. Health Technol Assess. 2001;5(26):1-149.
4. 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: 542–550.
5. Crompton GK, Dewar MH, Allbut HM, Innes JA. Inhaler preference and technique in inhaler native subjects; a comparison of HFA and conventional devices. Thorax 2000;55(Suppl 3): A61.
6. Crompton GK. Problems patients have using pressurized aerosol inhalers. Eur J Respir Dis 1982;63(Suppl 119):101–4.
7. De Blaquiere P, Christensen DB, Carter WB, Martin TR. Use and misuse of metered-dose inhalers by patients with chronic lung disease. A controlled, randomized trial of two instruction methods. Am Rev Respir Dis. 1989 Oct; 140(4):910-916.
8. De Oliveira MA, Bruno VF, Ballini LS, BritoJardim JR, Fernandes AL. Evaluation of an educational program for asthma control in adults. J Asthma 1997; 34: 395–403.
9. Fritsch K, Jacot ML, Klarer A, Wick F, Bruggmann P, Krause M, et al. Adherence to the Swiss guidelines for the management of COPD: experience of a Swiss teaching hospital. Swiss Med Wkly. 2005; 135(7-8): 116-21.

10. Gayrard P, Orehek J. Inadequate use of pressurized aerosols by asthmatic patients. Respiration 1980;40:47–52.
11. Giraud V, Roche N. Misuse of corticosteroid metered-dose inhaler is associated with decreased asthma stability. Eur Respir J. 2002;19(2):246–51.
12. Giraud V, Roche N. Misuse of corticosteroid metered-dose inhaler is associated with decreased asthma stability. Eur Respir J 2002;19:246–51.
13. Horsley MG, Bailie GR. Risk factors for inadequate use of pressurized aerosol inhalers. J Clin Pharm Ther. 1988 Apr; 13(2):139-143.
14. Jackson C, Lipworth B. Optimizing inhaled drug delivery in patients with asthma. Br J Gen Pract. 1995;45(401):683–7.
15. Lenny J, Innes J, Crompton G. Inappropriate inhaler use: assessment of use and patient preference of seven inhalation devices. Respir Med 2000;94:496–500.
16. Lindgren S, et al. Clinical consequences of inadequate inhalation technique in asthma therapy. Eur Respir Dis 1987;70:93.
17. Mickle TR, Self TH, Farr GE, Bess DT, Tsiu SJ, Caldwell FL. Evaluation of pharmacists' practice in patient education when dispensing a metered-dose inhaler. DHCP. 1990 Oct; 24(10):927-930.
18. Newman S, et al. Improvement of drug delivery with a breath-activated aerosol for patients with poor inhaler technique. Thorax 1991;46:712–6.
19. Plaza V, Sanchis J. Medical personnel and patient skill in the use of metered-dose inhalers: a multicentric study. CESA Group. Respiration 1998; 65: 195–8.
20. Rabe KF, Hurd S, Anzueto A, Barnes PJ, Buist SA, Calverley P, et al. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease: GOLD executive summary. Am J Respir Crit Care Med. 2007;176(6):532-55.