

**EVALUATION OF PATIENT COUNSELLING THROUGH NEBULIZERS WITH
COMORBIDITIES IN TERTIARY CARE HOSPITAL**Kanaganti Swathi¹, Saga Sunka², Punardeep Roy Karmakar³, Sheereen Jahan Begum*³ and Anikul Islam³¹Department of Pharmacy Practice, Holy Mary College of Pharmacy, Bogaram, Hyderabad, Telangana, India.²Critical care Consultant Intensivist (CCU), Sunshine Hospitals, Hyderabad, Telangana, India.³Pharm. D (Doctor of Pharmacy), Holy Mary College of Pharmacy, Bogaram, Hyderabad, Telangana, India.***Corresponding Author: Sheereen Jahan Begum**

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ABSTRACT

Aim: To evaluate the patient counselling through Nebulizers with comorbidities. **Patients and Methods:** All patients with disease complications who used nebulizers had to give written consent to a comprehensive medical history, age, gender, and drugs utilized in nebulizers. **Results:** In our patients who use nebulizers, we found that DUOLIN is the most commonly prescribed drug, followed by Budecort and Foracort. According to the disease, 42 percent of people have a BA, 77 percent have COPD, 52 percent have LRTI, and 6 percent have LRTI (OTHERS). The information gathered was very good and straightforward. The patient information leaflet was created to help patients understand how to use their nebulizers properly. The research indicates the therapeutic level of nebulizer medicines. determines that patients require medical education to achieve therapeutic levels. **Conclusion:** According to the findings, the use of nebulizers is widespread among those aged 50 to 80. DUOLIN was most commonly used in 42 percent of cases (BA), 77 percent of cases (COPD), 52 percent of cases (LRTI), and 46% of cases (OTHERS), according to the study. The p-value for all of the data was 0.0001, indicating that the data is significant at 0.05. According to this study, patients who use nebulizers have a low therapeutic level, which is due to a lack of medical expertise about nebulizer use. The patient information leaflet was created to advise patients on the proper use of nebulizers and the medications used in them, as well as their negative effects. This study was undertaken to determine nebulizer usage among 146 patients who most commonly utilized nebulizer drugs, as well as to raise awareness among patients about proper nebulizer usage and educate the public.

KEYWORDS: Patient Counselling, Nebulizer, Respiratory tract Infections.**INTRODUCTION**

Aerosolized drugs are delivered directly into the lungs through inhalation therapy. It is the preferred route of medication administration in the treatment of obstructive airway diseases (OADs) such as asthma and chronic obstructive pulmonary disease (COPD) because it provides a faster onset of action while also improving safety and efficacy. Ayurvedic medicine has a long history of using inhalation treatment for asthma and other ailments, asthma or cough with dyspnea, recommendations in 17th-century Ayurvedic literature suggest smoking an anticholinergic mixture from the Datura family of plants. Asthma smokes, powders, and cigars, along with stramonium leaves and atropine-like effects, were frequently employed as "fuming asthma treatments" in the nineteenth century. According to MuerMyerse term "nebulizer" was defined in 1874 as "a device for turning a liquid into a fine spray, especially for medicinal purposes."^[1,2]

Selection of inhaler in clinical practice:

A variety of factors influence inhaler selection, pulmonary function (i.e., inspiratory flow and expiratory flow) device handling, usage of breathing technique. a spacer, inhaler technique required and patient preference. It is critical to use the inhaler correctly. Optimum medication distribution to the lungs and peripheral organs airways, leading in increased potential for success of disease prevention and control. Because therapy effectiveness is tied to Adherence and consideration of the patient's wishes are critical. And patient satisfaction, treatment adherence, and long-term outcomes can all benefit from customized device selection.^[3]

Training and Education to support the use of inhalers:

One of the most regularly cited challenges to adherence is the abuse of inhalers. MELANI ET AL found the strongest and most significant links between inhaler misuse and older age, less schooling, and a lack of inhaler technique instruction. Even the most user-

friendly technology, it must be admitted, requires teaching and demonstration, which has been demonstrated to be inadequate in various studies.

Because education is the only variable that can be altered, health care professionals should strive to tailor recommendations to specific patient needs while also keeping their own education current.

When a gadget is introduced into clinical practice, the claim that it is user-friendly conveys the idea that no additional education or training is required. However, any device will require patient training and upskilling, and user technique should always be revisited in patients with poor asthma control, even if they are using an easy-to-use device. While training can improve the ability to use inhalers, many patients have noted that after a short period of time, they revert to the erroneous technique.

The Global Initiative for Asthma (GINA) recommends a physical demonstration of inhaler technique and patient retraining at follow-up sessions as techniques for ensuring effective device use.

A Cochrane review looked at a variety of interventions and found that while several studies showed an increase in the number of people using the correct inhaler technique after the intervention, it was unclear if this translated into clinical benefits. The authors suggested that healthcare providers continue to encourage their patients to demonstrate their method on a frequent basis and correct it as needed, as well as refer them for training when it is available.^[2]

The importance of inhalation technique:

Drug deposition differs depending on the technique used to use the inhaler device, and it is the most important aspect in determining drug deposition and, as a result, disease control and clinical outcomes. Incorrect inhaler technique has been linked to an increase in symptoms, hospitalizations, deaths, and financial loss in studies. As a result, it's critical to follow each inhalation step precisely.^[4]

Indications for nebulization:

1. Bronchodilator Drug Administration: a. Nebulization is the most common method of administration during an acute asthma attack. b. Bronchoids may be recommended for respiratory patients who are too short of breath to use a pressurized aerosol or rotahaler efficiently.
2. Inhalation therapy with a nebulizer is the only effective inhalation therapy for newborns and children with asthma until they are about 4 years old.
3. Antibiotic and Antifungal Agent Administration: a. In some cases, resistant chest infections such as cystic fibrosis or bronchiectasis; in some cases, resistant chest infections such as cystic fibrosis or

bronchiectasis; in some cases, resistant chest infections such as pneumonia

1. b. Antibiotics may be provided for direct inhalation into the lungs.
4. To Aid Expectoration: It has been shown that inhaling hypertonic saline improves bronchial secretion clarity.
5. LOCAL ANALGESIA: For the relief of dyspnea in terminally ill patients, such as those with alveolar cancer.

How to use a nebulizer:

Begin by double-checking that all of your pieces are clean. Half-fill the medicine cup with liquid medicine. Connect the liquid container and the compressor with the plastic tubing. After that, put on the mouthpiece or mask. Ensure the nebulizer is correctly misting by turning it on. Insert the mouth piece into your mouth, or place the mask over your nose and mouth. Inhale gently and normally until all of the drugs has been consumed.^[5]

How to clean:

After each usage, your nebulizer should be cleaned with hot, soapy water. It needs to be disinfected at least once a week. Dry it with a paper towel or a thin cloth in the air.^[6]

Daily cleaning:

First, remove the mouthpiece or mask and the pill container. Wash these components in hot water using a mild liquid dish detergent. Shake off any remaining water. Wait for the pieces to dry naturally on a clean paper towel or dish towel.^[7,8]

Disinfecting:

Remove the detachable parts [mouthpiece and medication container] from the mouthpiece. Soak them in a doctor's solution or one-part white vinegar to three parts hot water. Soak these parts for one hour or as long as the instructions specify. Remove the pieces and air dry them.^[9]

Storage tips:

Keep them in an airtight plastic container or bag after cleaning and drying the parts. Store in a cool, dry location. Ensure that your nebulizer is dust-free.^[10,11]

Objectives:

Primary objectives: To evaluate the patient counselling through nebulizer usage with comorbidities in tertiary care hospitals.

Secondary objectives: 1. To determine the prevalence of nebulizer use among people of various ages and genders. 2. To evaluate the drugs that are used in the nebulizer machine. 3. To determine the most effective use of a nebulizer in patients with comorbidities. 4. To educate patients on how to properly use a nebulizer. 5. To raise public awareness regarding nebulizers and the pharmaceuticals that go into them and their negative effects.

METHODS AND METHODOLOGY

- Study site: The study was conducted in Sunshine Hospital, Paradise, Secunderabad.
- Study period: The study was conducted for six (6) months.
- Study design: A prospective & observational study.
- Inclusion criteria: 1. Patient age between (15 to 100 years). 2. Patient with a medical history of Inhalers or Nebulizers usage. 3. Patient with comorbidities. 4. Patients who are admitted to the hospital for at least 3 days.
- Exclusion criteria: 1. Patients below 15 years, Neonates, Pediatrics with asthma, etc. 2. Bedridden Patients 3. Inhaler users. 4. Nebulizer device types. 5. Pregnant and lactating women.
- Study procedure: 1. Study has been conducted in Sunshine Hospital. This is a prospective observational study. 2. Data was collected from patient's case sheets for those who are willing to enroll in the study after obtaining consent. 3. All the

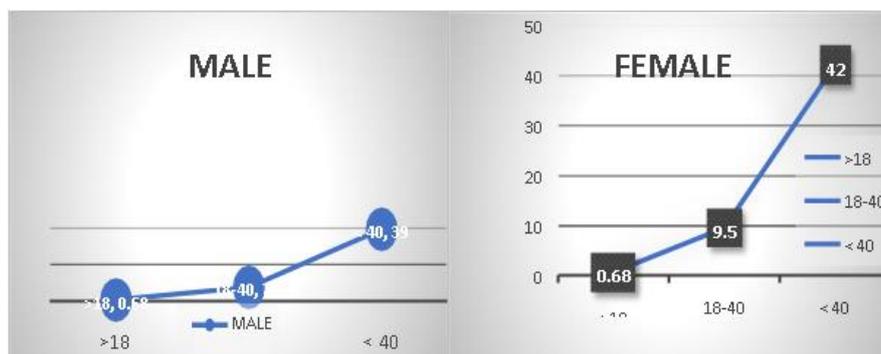
data required for the study is entered into the data collection form which has been prepared for the project. 4. We enrolled 145 patients for the study. Stress questions have been asked to the patient under pressure in patient attender & explained about proper usage of nebulizer by using Patient Information Leaflet, all the data was obtained.

RESULTS

The study was conducted among 146 nebulizer usage patients attending Sunshine Hospital in Secunderabad. After receiving informed written consent from the patient, this study was conducted for 6 months from October 2021 to April 2022. Pediatrics. Inhaler users, nebulizer device types, and pregnant and lactating women were exclusion criteria. In this study, a total of 146 nebulizer user-patient data was collected. The distribution of population and patient clinical characteristics has been shown in Table- 1.

Table 1: Age charecterisation in nebulizer usage.

Age characterization					
Age	Male	Male %	Female	Female %	Total
18	1	0.68 %	1	0.68 %	2
18 – 40	11	7.5 %	14	9.5 %	25
< 40	57	39 %	62	42 .4 %	119
Total	69		77		146

**Graph 1: Representation of nebulizer usage in Males and Females.****Table 2: Significance.**

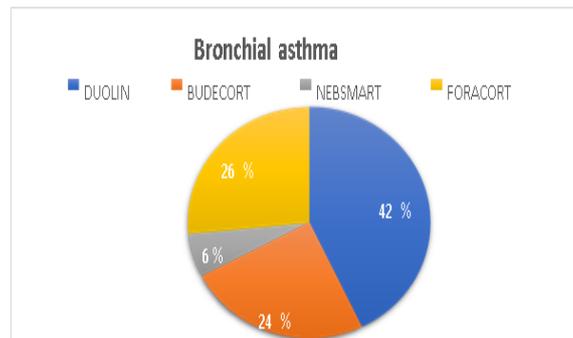
Age characterisation				
Age	Male	Female	Total	P-value
18	1	1	2	< 0.05
18 - 40	11	14	25	< 0.05
< 40	57	62	119	< 0.05
Total	69	77	146	

The above table demonstrates p-value is significant. The degree of freedom was 2. The p-value was < 0.0001 . Hence the result is significant at < 0.05.

Table 3: Nebulizer usage in bronchial asthma according to age.

Nebulizer characterization of bronchial asthma					
Age	Duolin	Budocort	Nebsmart	Foracort	Total
50	6	4	1	4	15
50 – 80	14	7	2	9	32

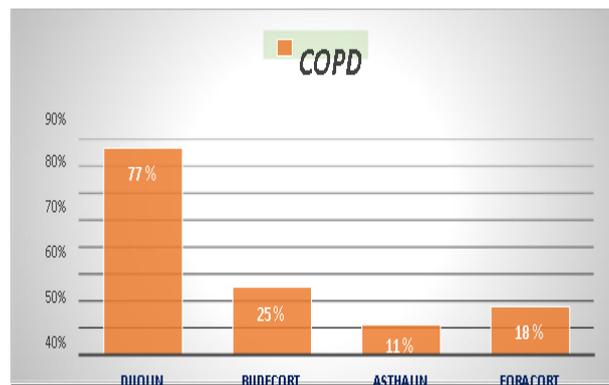
< 80	1	1	0	0	2
Total	21	12	3	13	49



Graph 2: Representation of nebulizers in bronchial asthma.

Table 4: Nebulizer usage according to age in copd.

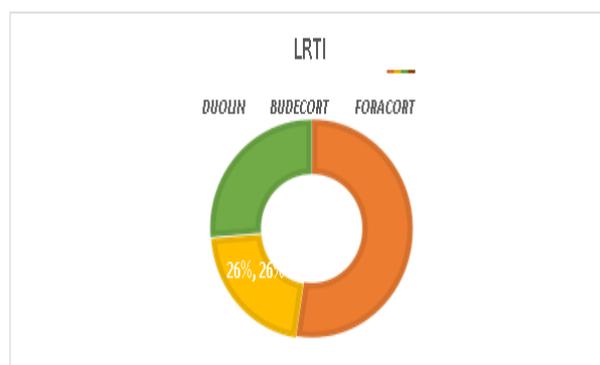
Nebulizer characterisation copd						
Age	Duolin	Budecort	Nebsmart	Foracort	Asthalin	Total
>50	2	1	0	1		4
50-80	9	6	0	4	2	21
<80	1	0	0	0	1	2
Total	12	7	0	5	3	27



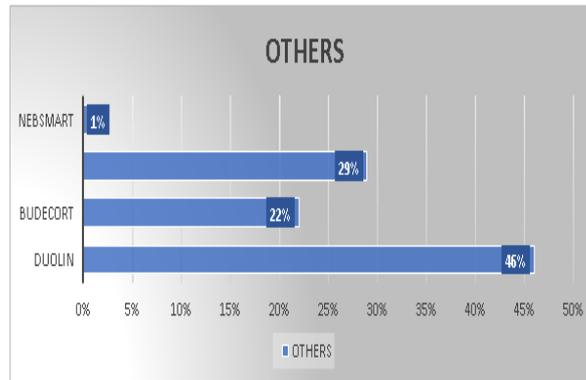
Graph 3: Representation of nebulizers in copd.

Table 5: Significance in copd.

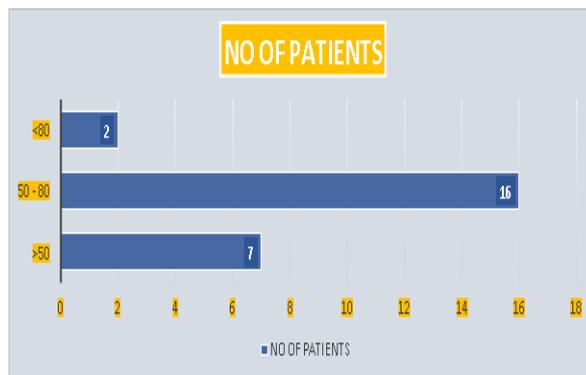
COPD						
Age	Duolin	Budecort	Foracort	Asthalin	Total	P- value
>50	2	1	1	0	4	< 0.05
50 - 80	9	6	4	2	21	< 0.05
<80	1	0	0	1	2	< 0.05
Total	12	7	5	3	27	



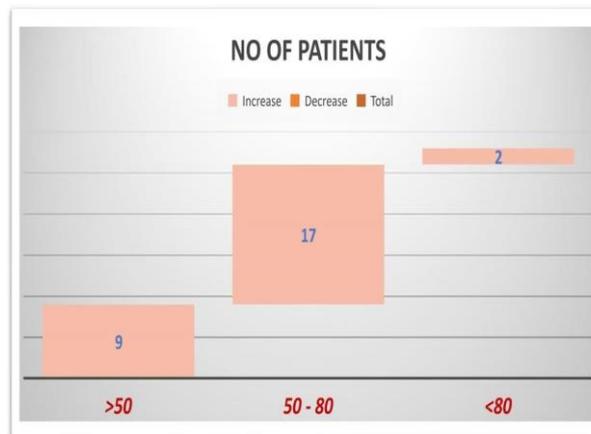
Graph 4: Representation of nebulizer usage in Lrti.



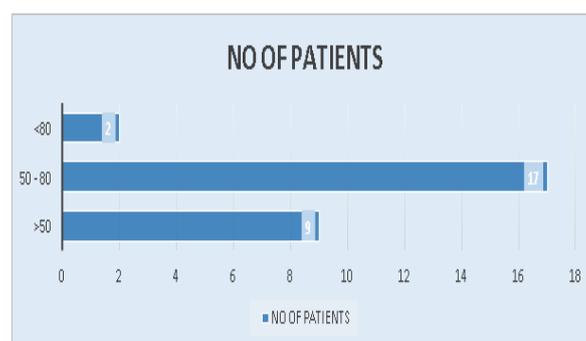
Graph 5: Representation of nebulizers in others.



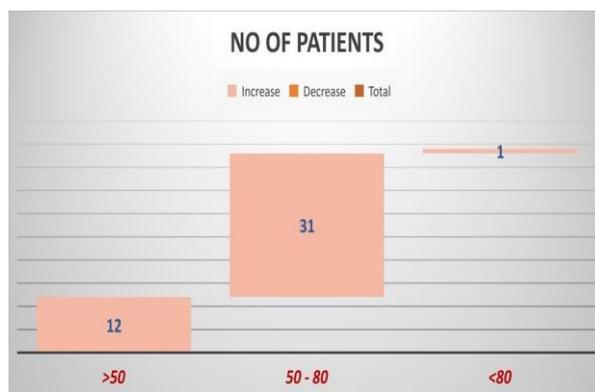
Graph 6: Nebulizer usage % according to age in bronchial ASTHMA.



Graph 7: Nebulizer usage % according to age in copd.



Graph 8: Nebulizer usage % according to age in Irti.



Graph 9: Nebulizer usage % according to age in others.

Table 6: Disease- wise distribution.

Disease- wise distribution						
Nebulizers	Copd	Ba	Lrti	Others	Total	P-value
Duolin	12	21	22	36	91	< 0.05
Budecort	7	12	9	17	45	< 0.05
Foracort	5	13	11	23	52	< 0.05
Asthalin	3	0	0	0	3	< 0.05
Nebsmart	0	3	0	0	3	< 0.05
Total	27	49	42	76	194	

DISCUSSION AND CONCLUSION

The majority of the 146 patients used a DUOLIN nebulizer. Budecort, Foracort, Asthaline, and Nebsmart accounted for 30% of the total. The Patient Information Leaflet was created to provide patients with advice on how to use nebulization correctly.

The majority of nebulizer users were found to be under the age of 18 in both males and females, at 0.68 percent, followed by 18–40 years, with a percentage of males of 7% and females of 9.5percent, and above 40 years, with a percentage of males of 39% and females of 42%. Patients aged 50 to 80 years old used nebulizers at a rate of 28%, followed by patients aged 50 to 80 years old at a rate of 64%, and patients aged beyond 80 years old at a rate of 8%.

According to the findings, the use of nebulizers is widespread among those aged 50 to 80 years DUOLIN was most commonly used in 42 percent of cases (BA), 77 percent of cases (COPD), 52 percent of cases (LRTI), and 46% of cases (OTHERS), according to the study. The p-value for all of the data was 0.0001, indicating that the data is significant at 0.05. According to this study, patients who use nebulizers have a low therapeutic level, which is due to a lack of medical expertise about nebulizer use. The patient information leaflet was created to advise patients on the proper use of nebulizers and the medications used in them, as well as their negative effects. This study was undertaken to determine nebulizer usage among 146 patients who most commonly utilized nebulizer drugs, as well as to raise awareness among patients about proper nebulizer usage and educate the public.

REFERENCES

- Hadda V, Salvi S, Shevade M, Aggarwal A, Apte K, Barne M, et al. A Practical Guide on the Use of Inhaler Devices for Asthma and COPD [Internet]. Journal of The Association of Physicians of India Published on 1 st of Every Month, 2021. Available from: <https://www.researchgate.net/publication/350088942>
- Rau JL, Faarc R. 2004 Philip Kittredge Memorial Lecture The Inhalation of Drugs: Advantages and Problems Introduction: The Inhalation of Drugs for Respiratory Disease, 2005.
- Usmani OS. Choosing the right inhaler for your asthma or COPD patient Ther Clin Risk Manag, 2019; 15: 461–72.
- Pedersen S. Inhalers and nebulizers: Which to choose and why. Respir Med, 1996; 90(2): 69–77.
- DiGacinto J, Goldman R. What is a Nebulizer? Types, Uses, Cleaning, and More [Internet]. Available from: <https://www.healthline.com/health/asthma-nebulizer-machine>
- Rogliani P, Calzetta L, Coppola A, Cavalli F, Ora J, Puxeddu E, et al. Optimizing drug delivery in COPD: The role of inhaler devices. Respiratory Medicine, 2017; 124: 6–14.
- Clay MM, Clarke SW. Wastage of drug from nebulisers: A review. J R Soc Med, 1987; 80(1): 38–9.
- O’Callaghan C, Barry P. The science of nebulised drug delivery. Thorax, 1997; 52(2): 31–31.
- McCarthy SD, González HE, Higgins BD. Future trends in nebulized therapies for pulmonary disease. Journal of Personalized Medicine. MDPI AG, 2020; 10.

10. Dhand R, Tobin MJ. Inhaled bronchodilator therapy in mechanically ventilated patients. *Am J Respir Crit Care Med*, 1997; 156(1): 3–10.
11. Zainudin BMZ, Biddiscombe M, Tolfree SEJ, Short M, Spiro SG. Comparison of bronchodilator responses and deposition patterns of salbutamol inhaled from a pressurised metered dose inhaler, as a dry powder, and as a nebulised solution. *Thorax*, 1990; 45(6): 469–73.