



## PATIENT SATISFACTION IN USE OF SALBUTAMOL THROUGH METERED DOSE INHALER FOR TREATMENT OF WHEEZE IN ASTHMA

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### ABSTRACT

**Objective:** To investigate the patient satisfaction and the acceptability of salbutamol through Metered Dose Inhaler (MDI) in the treatment of wheeze in asthma. **Methods:** 34 participants between ages of 5 and 18 years were included. Modified Pulmonary Index (MPI) score was used to assess the improvement after treatment with salbutamol delivered by inhaler. Pre and post treatment scores were used to assess treatment outcome. Questionnaire was used to assess patient satisfaction by interviewing parents of participants. **Results:** After the use of inhaler, 12% participants had no change in symptoms, while 6% showing worsening of symptoms. In the remaining 82%, the symptoms reduced. 2.9% were not at all satisfied with the treatment, while 20.6% were moderately satisfied with the treatment. 76.5% of the participants were highly satisfied with the treatment. **Conclusion:** The use of Metered dose inhaler with salbutamol is very effective in reducing wheeze and other symptoms in asthma. Even those with no improvement in symptoms had high satisfaction with the treatment using salbutamol through MDI. This mode of drug delivery can enhance adherence and asthma control.

**KEYWORDS :** Wheeze, asthma, Metered Dose Inhaler, Modified Pulmonary Index Score

### INTRODUCTION

Asthma is a chronic respiratory problem occurring due to inflammatory response in the airways. The disorder leads to partial obstruction of the airway. Asthmatics suffer from symptoms like wheeze, chest tightness, difficulty in breathing that are recurrent (1). It is a common problem seen in the Paediatric population in outpatient clinics. Children are highly susceptible to respiratory problems and the incidence of asthma is quite high. One of the main symptoms of asthma is the presence of wheeze. Asthma is commonly seen in economically disadvantaged communities (2). The disease is also common in urban environments where there are high levels of allergens and pollutants. Asthma is the third most common reason for paediatric hospitalizations.

Wheeze is a symptom seen in asthma. It occurs due to air flowing through compressed airways (3). Wheeze can occur either on inspiration or during expiration. In some people it occurs both during inspiration and expiration and is called as biphasic wheezing. The loudness of the wheeze is associated with severity in the airway obstruction (4).

If a child with wheeze has increasing difficulty in breathing, treatment is initiated (5,6). The treatment is usually a bronchodilator that helps in widening the airways and reduces the difficulty in breathing. Wheeze in asthma can be treated effectively with salbutamol (7). The salbutamol is delivered through Metered dose inhalers or through the use of nebulizers. Studies have shown that the use of nebulizers may be as effective as the use of Metered dose inhalers, but treatment with nebulizers can cause unwanted side effects like tachycardia (8). The use of Metered dose inhalers is a preferred method of treating wheeze and associated symptoms caused by asthma.

The Modified pulmonary index score was used to assess severity of asthma in children. It is a tool that has been studied extensively and has been found to have high reliability and validity (9). It has also been used as a tool to indicate the severity of asthma (10).

### OBJECTIVE OF THE STUDY

The main objective of the study was to investigate the patient satisfaction and the acceptability of metered dose inhaler in the treatment of wheeze in asthma.

### METHODS

#### Study design, setting, participants and procedure

The hospital-based study was conducted at the Christian Medical College, Vellore, a large tertiary care hospital located in South India. 34 patients were included in the study between 2017 October and 2020 March. The youngest study participants were 5 and the oldest participant was 18 years old. Since the participants recruited for the study were minors, consent was obtained from their parents and assent

from children above 7 years. The children who suffered from comorbidities like cardiac conditions were excluded from the study. Any child who had learning disability that prevented them from using the MDI was excluded. Children who had used nebulizers in the previous 6 months for salbutamol delivery were included.

The study participants who provided consent were assessed with the Modified Pulmonary Index score for severity of asthma. Then they were provided the intervention, which was providing five puffs (0.5 mg) of Salbutamol through MDI in patients under six years of age. For those who were above six, 10 puffs (1mg) of Salbutamol through MDI was given. 10 minutes after the intervention, the patients were assessed with the MPI score again. This was tested to objectively check the effectiveness of the salbutamol drug delivered through the inhaler.

The patients were interviewed on their satisfaction of the treatment and its effectiveness. They were asked about their acceptability of the use of salbutamol through MDI as a tool of treating asthma and wheeze. Since they had previous experience of having undergone nebulizer therapy, they were asked to narrate their satisfaction and acceptability of the MDI when compared to the use of nebulizer.

### RESULTS

Of the 34 children who were part of the study, there were 19 males and 15 females. The minimum age was 5 and the maximum age was 18. Most of the children recruited for this study were between the age group 5 and 12. Most of the children who were suffering from asthma and wheeze also had other coexisting symptoms like presence of breathlessness (74%), cough (91%) and a few patients had fever (15%), as seen in Table 1.

**Table 1: Demographic variables sheet (N=34)**

S.No	Variable	Frequency (%)
1	Male	19 (55.88)
2	Female	15 (44.11)
3	Age 5-8	14 (41.18)
4	Age 9-12	16 (47.06)
5	Age 13-18	4 (11.76)
6	Breathlessness	25 (73.53)
7	Cough	31 (91.18)
8	Fever	5 (14.71)

The MPI score is a measure of the improvement in the condition of the patient. A higher score tells worsening symptoms. In this study, as seen in Table 2, out of the 34 patients who were given the intervention, the MPI score remained the same in 4 patients (11.76%), while it increased in 2 patients (5.88%), showing worsening of symptoms. In the remaining 28 patients (82.35%), the symptoms reduced and so there was an improvement in the MPI score. This shows that the intervention was very helpful to the patient.

**Table 2: Status of symptoms after intervention**

S.No	Effect of treatment on symptoms	Frequency (%)
1	No change in Symptoms	4 (11.76)
2	Symptoms worsened	2 (5.88)
3	Symptoms improved	28 (82.35)

The maximum pre-test score was 12 and the minimum score was 2. The mean pre-test score was 7.03 with a Standard Deviation of 2.32 (Table 3). The maximum post test score was 11 and the minimum score was 0. The mean post test score was 4.97 with a Standard Deviation of 2.44

**Table 3: Frequency table of MPI pre test scores**

S.No	MPI score Value	Frequency of pre test scores	Frequency of post test scores
1	0	-	1 (2.9%)
2	1	-	1 (2.9%)
3	2	1 (2.9%)	3 (8.8%)
4	3	1 (2.9%)	4 (11.7%)
5	4	2 (5.8%)	7 (20.5%)
6	5	1 (2.9%)	6 (17.6%)
7	6	12 (35.2%)	3 (8.8%)
8	7	5 (14.7%)	3 (8.8%)
9	8	6 (17.6%)	4 (11.7%)
10	10	3 (8.8%)	1 (2.9%)
11	11	-	1 (2.9%)
12	12	3 (8.8%)	-

1 participant (2.9%) was not at all satisfied with the treatment, while 7 participants (20.6%) were a little satisfied with the treatment. 26 participants (76.5%) were highly satisfied with the treatment.

**Table 4: Correlation between perceived patient satisfaction and acceptability with the Metered dose inhaler therapy**

Variables	Correlation coefficient(r)	Pearson Correlation P value
Patient satisfaction	0.029	0.010***
Acceptability with the Metered dose inhaler therapy		

**Pvalue<0.05 is significant**

## DISCUSSION

Acute attacks of asthma need immediate treatment to prevent worsening of the symptoms. Breathlessness, cough and wheeze are commonly seen as symptoms of the disease. These need to be treated as early as possible and as quickly as possible to relieve the symptoms. Patient satisfaction of the treatment is also important as studies have shown that satisfaction can help in better adherence to treatment and control of asthma. In that study, the patients included were all over 18 years of age and inhalers were used by the study participants in their home setting (11). In this study, the selected patients are less than 18 years of age and the satisfaction in the treatment method was expressed by the parents. The treatment was provided in the hospital by the nurse who was treating the child.

Visible reduction in symptoms of their children played a major role in the satisfaction level of parents. There was a significant reduction in the wheeze and other symptoms as seen in the frequency table of pre and post test scores, which is an improvement in the MPI score (Tables 3). Satisfaction of a treatment is different from the benefit derived from a treatment, but they are linked to each other and may be directly proportional. In this study there is a significant improvement in MPI score and a significantly high level of patient satisfaction on mode of treatment delivery and outcome. Studies have shown that the satisfaction with a treatment will also depend on the usability and portability of a device used in the treatment (11).

As per Table 2, the symptoms remained the same in 11.66% of the study population and the symptoms worsened in 5.88% of the study population. Despite this, only 3% of the study population was not at all satisfied with the treatment provided. This shows that even though there was no improvement or even possible worsening of the symptoms, there were patients and parents who were satisfied with the treatment provided. This is an important finding in this study that even when there may not be any visible improvement in symptoms, there is acceptability and satisfaction with the treatment provided. This could only mean that the mode of drug delivery and the method used

provided satisfaction. This aspect is quite similar to the findings of an earlier study which studied the optimal inhaler that could provide patient satisfaction during the treatment of asthma. The findings of the study showed that even when there was no significant difference in the control of asthma, there was high patient satisfaction with the use of a particular kind of inhaler device (12). This was attributed to the ease of inhaler use, low weight and size of inhalers that improved their portability. The findings of this study also seem to corroborate with that study in that even if there is no significant improvement in the outcome, the use of salbutamol through MDI provides satisfaction to patients using it to relieve symptoms of asthma.

## CONCLUSION

The use of MDI with salbutamol is very effective in reducing wheeze, which is the primary symptom of asthma. 82% of those who used MDI had a reduction in the symptoms. The use of MDI prevents exacerbation of the condition and helps relieve symptoms quickly. The high satisfaction (76.5%) of parents and patients with the use of inhalers can be due to the reduced time of treatment and the subsequent quick relief from symptoms. The use of MDI also reduces the cost of treatment. One important finding in this study is that in spite of no improvement in symptoms, some parents are satisfied with the MDI and its effectiveness and ease of use in providing treatment. This could help improve compliance to asthma treatment. Further comparative studies between the role of MDI and other methods of treating asthma and wheeze can be helpful in identifying if MDI is the most effective, satisfying and accepted method of treating asthma.

## Declarations:

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**Conflict of interest:** None

**Ethical approval:** Approved

## REFERENCES

- Mims JW. Asthma: definitions and pathophysiology. *Int Forum Allergy Rhinol*. 2015 Sep;5 Suppl1:S2-6.
- Maslan J, Mims JW. What is asthma? Pathophysiology, demographics, and health care costs. *Otolaryngol Clin North Am*. 2014 Feb;47(1):13-22
- Henry Gong J R. *Clinical Methods: The History, Physical, and Laboratory Examinations*. 3rd ed.
- Shim CS, Williams MH Jr. Relationship of wheezing to the severity of obstruction in asthma. *Arch Intern Med*. 1983 May;143(5):890-2. PMID: 6679232.
- Bush A. Recent advances in the management of pre-school wheeze. *Afr J Respir Med*. 2016;11(2):1-7.
- Raywood E, Lum S, Aurora P, Pike K. The bronchodilator response in preschool children: A systematic review. *Pediatr Pulmonol*. 2016 Nov;51(11):1242-1250
- Carroll W, Lennay W. Drug therapy in the management of acute asthma. *Arch Dis Child Educ Pract Ed*. 2007 Jun;92(3):ep82-6.
- Deerojanawong J, Manuyakorn W, Prapphal N, Harnruthakorn C, Sritippayawan S, Samransamruajkit R. Randomized controlled trial of salbutamol aerosol therapy via metered dose inhaler-spacer vs. jet nebulizer in young children with wheezing. *Pediatr Pulmonol*. 2005 May;39(5):466-72
- Takanobu Maekawa, Mari S Oba, Toshio Katsunuma, Akira Ishiguro, Yukihiro Ohya, Hideo Nakamura, Modified Pulmonary Index Score Was Sufficiently Reliable to Assess the Severity of Acute Asthma Exacerbations in Children, *Allergology International*, Volume 63, Issue 4, 2014, Pages 603-607,
- Modified pulmonary index score (MPIS) and indication of hospitalization for acute asthma exacerbation in children NagatashiSagara, Ryouhei Suzuki, Akiko Aota, Kennishi Akashi, Toshio Kastunuma *European Respiratory Journal* Sep 2016, 48 (suppl 60)PA4363;
- Plaza V, Giner J, Calle M, et al. Impact of patient satisfaction with his or her inhaler on adherence and asthma control. *Allergy Asthma Proc*. 2018;39(6):437-444.
- Valero A, Ribó P, Maiz L, Barbero E, Calle M, Campo C, Ryttilä P, Giner J, Plaza V. Asthma patient satisfaction with different dry powder inhalers. *Expert Rev Respir Med*. 2019 Feb;13(2):133-138.