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Original Research Article

Understanding perspectives of asthma among pulmonologists in Indian settings: results from a questionnaire-based survey

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ABSTRACT

Background: Asthma is associated with high morbidity and mortality in India. This survey was undertaken to explore the perspectives of pulmonologists towards in-clinic management of patients with asthma.
Methods: It was a cross-sectional survey of pulmonologists conducted across India. It was formulated to provide unbiased observations of real-world clinical practice focusing on methods of diagnosis of asthma and its treatment preferences.
Results: The participants included 805 pulmonologists, with the majority primarily treating patients with asthma (62%), chronic obstructive pulmonary disease (19%) and allergic rhinitis (19%). More than 86% of pulmonologists consider clinical symptoms, history of childhood asthma, family history, and chronic allergic rhinitis for initial diagnosis. About 19-23% prefer spirometry alone or in combination with family history for confirmation of asthma. The preferred inhaled corticosteroids-long-acting bronchodilator (ICS-LABA) combination was budesonide-formoterol amongst 83% of pulmonologists. For both dry powder inhaler (DPI) and metered dose inhaler (MDI) devices, fine particle fraction per cent and delivered dose were ranked as the two most important attributes.
Conclusions: Asthma is the most prevalent diagnosis among patients treated by pulmonologists on the basis of clinical presentation and medical history. The most commonly used pharmacotherapy for the treatment of asthma comprises ICS-LABA, with budesonide-formoterol being the preferred combination. Fine particle fraction per cent and magnitude of delivered dose influence the choice of asthma inhaler prescriptions the most.

Keywords: Asthma, ICS-LABA, Maintenance and reliever therapy, Survey

INTRODUCTION

The Seasonal Waves of Respiratory Disorders (SWORD 2017-18) multicentric study reported that asthma (29.8%) is the most prevalent respiratory disorder in India compared to other respiratory diseases [chronic obstructive pulmonary disease (15.6%), respiratory tract infections (11.3%), and tuberculosis (8.7%)].[1] The previous Indian study on the epidemiology of asthma, respiratory symptoms, and chronic bronchitis in adults (INSEARCH-2012) study reported an overall prevalence of 2.05% with an estimated 17.23 million patient pool.[2]

The estimates as per the Global Burden of Disease (GBD, 1990–2019) are much higher, 34.3 million, contributing to 13.09% of the global burden.[3] It also accounts for nearly 28% of disability-adjusted life years (DALYs) in our population.[3] There were approximately 13/1000 fatalities attributed to asthma in India. Thus, as per these estimates compared to the global figures, India has a three times higher mortality rate and two times higher DALYs.[4] Among the various factors which influence the higher prevalence, frequency, and severity of asthma symptoms, underdiagnosis and undertreatment may be major contributors.

In a real-world setting, the perspectives of pulmonologists provide insight into a particular respiratory disease state and its management. Therefore, we undertook a questionnaire-based survey across India with the primary objective of exploring the perspectives of pulmonologists towards in-clinic diagnosis and management of patients with asthma. The secondary objectives included determining the physicians' therapy preferences, factors influencing their choices in real-world settings, and inhaler and spacer preferences focusing on device features guiding inhaler choice. The secondary objective was also to determine the proportion of asthma patients with cardiovascular disease and allergic rhinitis since such comorbidities affect the choice of anti-asthmatic agents.

METHODS

Design and participants

This was a cross-sectional survey of pulmonologists conducted across all states of India from Jan-June 2022. The questionnaire was developed to provide unbiased observations of real-world clinical practice from a pulmonologist's perspective to understand factors affecting current practices of standards of care. It was developed by reviewing the published literature on a knowledge-attitude-practice survey of asthma among doctors. The questionnaire was subsequently validated by key specialists in the therapy area. The pulmonologists were chosen based on their educational qualifications and clinical experience in the field of respiratory disease management. The validated questionnaire was then shared with the Pulmonologist through an online platform. The study was conducted as a survey and comprises real-world in-clinic observational research. It does not involve any intervention or patients; therefore, no ethics committee approval is applicable.

Variables

Pulmonologists provided information about the patient pool they majorly treat, along with common comorbidities noted. They also provided percentage data regarding the methods used for the initial and final diagnosis of asthma. The pulmonologists opined on their preferred ICS-LABA therapy with desirable characteristics and inhaler devices and ranked their attributes according to their significance in improving effectiveness.

Statistical analyses

The data was analyzed and expressed as a percentage for all the parameters using the Microsoft Excel program 2016.

RESULTS

The survey included responses from 805 pulmonologists across India. The proportion of participant pulmonologists was almost similar across the west (18.63%) and east (15.4%) zones. The maximum participation was from the south zone (34.77%), followed by the north zone (20.37%) and the least from the Central zone (10.80%) (Table 1A). Among these, 35% of pulmonologists treated more than 60 patients/month, and another 28% approximately 20-40 patients/month, while the remaining treated around 20-40 patients/month with asthma. These data project an estimated patient pool of approximately 35,000 patients with asthma every month consulted by the participant pulmonologists.

Table 1: Distribution of participant pulmonologists and frequency of patients treated for asthma, COPD and allergic rhinitis.

	Proportion
Number of participant pulmonologists	805 (100%)
A. Across India (as per Zone), %	
South	34.77
North	20.37
West	18.63
East	15.40
Central	10.80
B. Patient distribution amongst pulmonologists (estimated patient pool of approx. 35000/month), %	
Asthma	62
Chronic obstructive pulmonary disease (COPD)	19
Allergic rhinitis (AR)	19

According to the data obtained, asthma was found to be the most common disorder treated by 62% of the pulmonologists, followed by COPD (19%) and allergic rhinitis (19%) (Table 1B). Among the various causes of respiratory diseases, tobacco exposure (current and past) tops the list, whereas the other important causes include atopy, environmental and occupational exposure to smoke, sedentary lifestyle, and family history.

When evaluating the patients for diagnosis of asthma, more than 86% of the pulmonologists consider clinical symptoms, history of childhood asthma, family history, and chronic allergic rhinitis for initial diagnosis of asthma, while very few pulmonologists considered either

of these individual factors or a combination of any two of these (<1%) (Figure 1). For confirmation of the diagnosis of asthma, <10% of pulmonologists preferred either FeNO, family history, PEFR alone, or in combination or combination with spirometry. Approximately 14-15% prefer a combination of spirometry, peak expiratory flow rate (PEFR), family history, and fractional exhaled nitric oxide (FeNO), while 19-23% prefer spirometry alone or in combination with family history for confirmation of the asthma diagnosis.

Around 35% of pulmonologists found allergic rhinitis as common comorbidity in 41-60% of patients with asthma in their clinical practice. More than 40% of pulmonologists found it to be common comorbidity in 21-40% of patients. Less than 10% of pulmonologists found AR as a comorbidity in >60% of patients with asthma. More than 50% of pulmonologists noted co-existing cardiovascular disease (CVD) in 10-20% of patients with asthma while >32% of pulmonologists found CVD in 21-40% of patients. Less than 14% found comorbid CVD in >40% of patients with asthma (Figure 2).

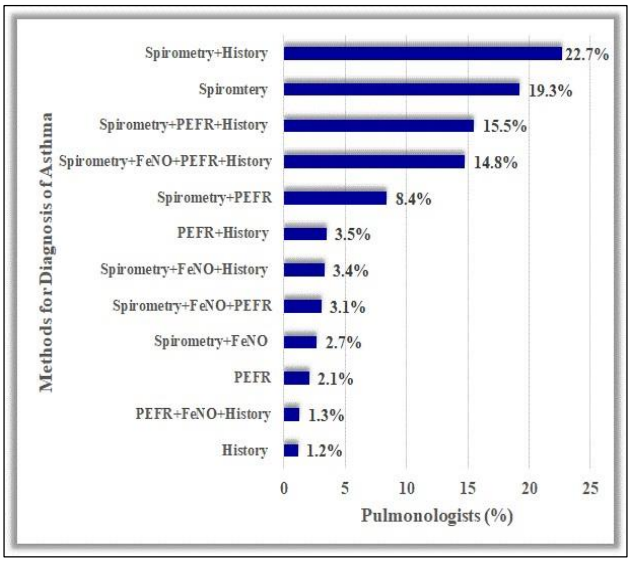

Figure 1: Methods used for clinical diagnosis of asthma by participant pulmonologists.

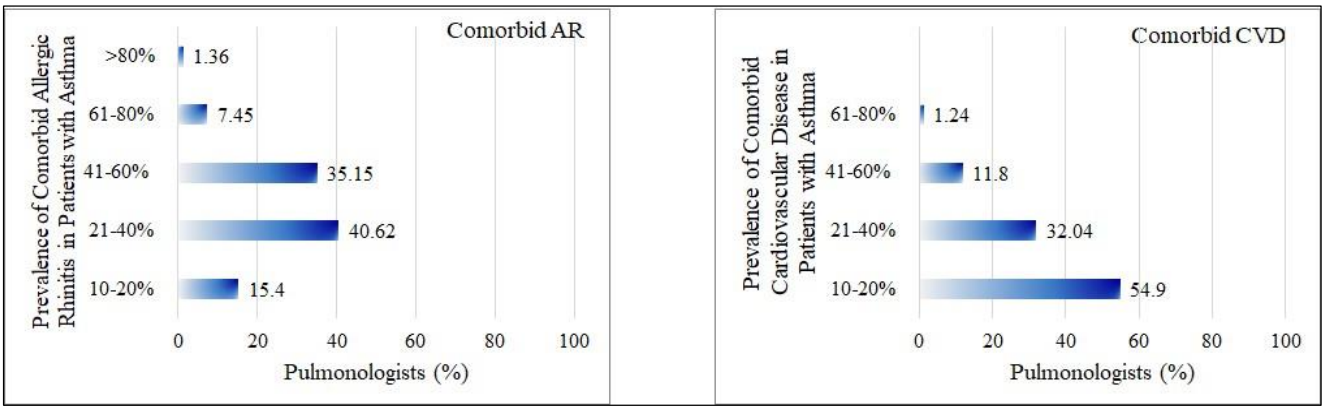

Figure 2: Frequency of comorbid allergic rhinitis (AR) and cardiovascular disease (CVD) in patients with asthma as per the participant pulmonologists.

The preferred ICS-LABA combination of the participant pulmonologists was budesonide-formoterol (83%) followed by fluticasone-formoterol (12%) and fluticasone-salmeterol (6%) for the treatment of asthma (Figure 3).

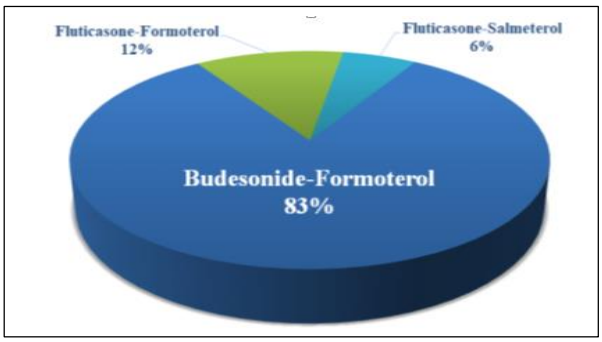

Figure 3: Preferred inhaled corticosteroids-long-acting bronchodilator (ICS-LABA) combination of the participant pulmonologists.

Of the various attributes affecting the choice of ICS-LABA therapy, the potency of ICS and the overall safety of the combination of ICS-LABA were considered clinically significant by 74.89% and 78.14% of the participant pulmonologists, respectively (Figure 4). The quick onset of action of LABA is an attribute important for selecting the ICS-LABA for 63.31% of participants. Cardiac safety was a concern amongst the pulmonologists (57%) and, hence, a significant attribute while choosing the ICS-LABA combination. Economic aspects were important attributes affecting the choice of therapy by nearly half of the pulmonologists. The availability of different strengths for a particular ICS-LABA combination influenced the choice of more than one-third of the pulmonologists.

Based on the clinical experience and patient feedback, the pulmonologists ranked the inhaler device characteristics affecting their choice. Among the dry-powder inhaler (DPI), the most important attribute is the percentage of

fine-particle fraction (44% ranked 1st) followed by the delivered dose (31% ranked 2nd). The lesser important features were threshold flow rate (29% ranked 3rd), device design (36% ranked 4th), and the number of clicks (39% ranked 5th), which affected the choice of a dry-powder inhaler (Figure 5).

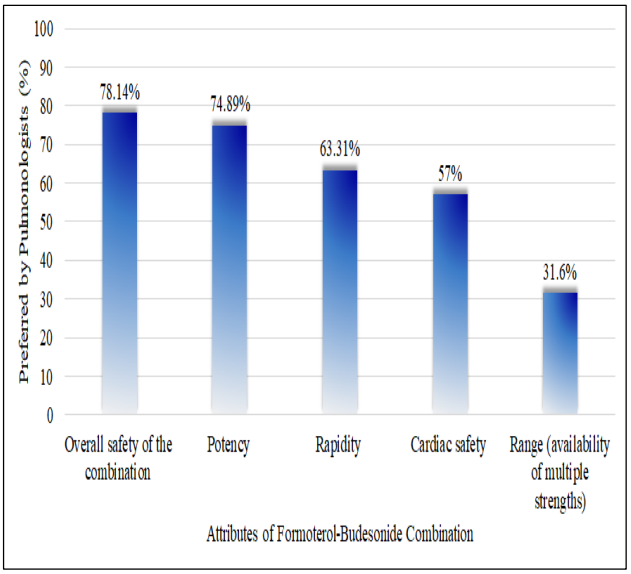

Figure 4: Preferred individual attributes for selecting inhaled corticosteroids-long-acting bronchodilator (ICS-LABA) by the participant pulmonologists.

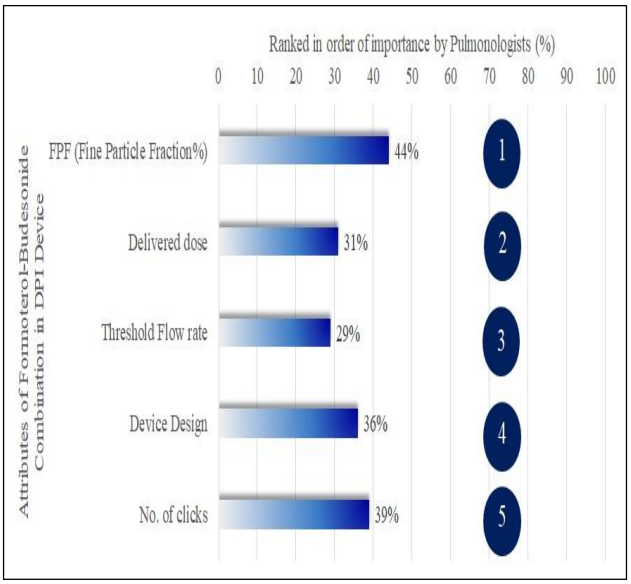

Figure 5: Attributes of budesonide-formoterol combination in a drypowder inhaler (DPI) device.

Similarly, for the metered-dose inhaler (MDI), the most important features were fine-particle fraction (48% ranked 1st) and delivered dose (40% ranked 2nd) while threshold flow rate ranked 3rd by 40% and dose counter last by 57% of participant pulmonologists (Figure 6). Among the spacer features, a volume of 250ml, antistatic and transparent material was ranked the first three important characteristics by 39% of pulmonologists, while one-way valve and conical design were considered minor elements.

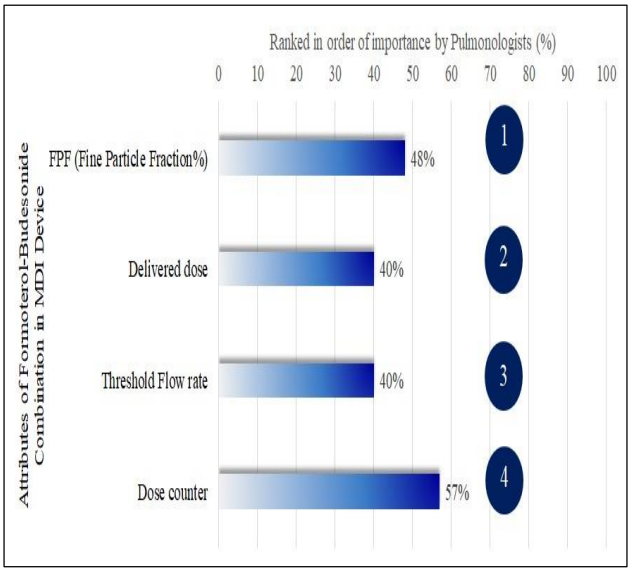

Figure 6: Attributes of budesonide-formoterol combination in a metered-dose inhaler (MDI) device.

DISCUSSION

The present survey investigated the perspectives of pulmonologists towards asthma with particular emphasis on means of diagnosis, the impact of ICS-LABA safety and effectiveness aspects, device features, and preferences on the choice of inhaler device.

This survey revealed that participant pulmonologists primarily treated a large pool of patients with asthma. The majority of pulmonologists formed their initial diagnosis of asthma based on clinical manifestations, family history of the disease, and pre-existing allergic rhinitis. The preferred means of confirmation of diagnosis was spirometry, either in combination with history or FeNO and PEFR. Over the last few years, there has been a predisposition to include objective testing in algorithms for the diagnosis of asthma, as depicted in the guidelines by the Global Initiative for Asthma (GINA). There exists a wide differential diagnosis for common respiratory symptoms, and a standardized approach to the diagnosis of asthma is lacking. Therefore, clinical diagnosis requiring a blend of history and physiological tests remains an important means of diagnosing asthma.[6]

Comorbidities are documented as important elements of asthma management. Besides, recurrent exacerbations in asthma are associated with peculiar comorbidities, which also need to be effectively managed without further worsening them. Allergic rhinitis is a common comorbidity in patients with asthma, as also indicated by

the current survey.[7] These patients benefit from low-medium dose ICS treatment.[5]

Asthma is also associated with an increased risk of CVD across age groups due to underlying common inflammatory aetiology. The current survey found that pulmonologists consider CVD as quite a common comorbidity in 21-40% of patients with asthma. Similar to these findings of our study, a previous meta-analysis has reported that asthma patients had a 32% increased risk of CVD compared to people without asthma.[8] Thus, asthmatic status increases the risk of CVD morbidity. Hence, considering cardiovascular safety when selecting pharmacotherapeutic agents for asthma is an important aspect in clinical practice. Thus, the pulmonologists' choice of therapeutic agents is highly influenced by their safety and efficacy in comorbid disease conditions in patients with asthma.

The present survey revealed that the preferred ICS-LABA combination is budesonide-formoterol among pulmonologists across India. The combination is as effective as concurrent therapy, with equivalent dosages of budesonide and formoterol administered via separate inhalers. Several RCTs have demonstrated that Budesonide-Formoterol reduces the rate of exacerbations and the need for reliever medication.[9-11] Studies have also shown that budesonide+formoterol therapy is a beneficial alternative due to the low load of ICS, low steroid exposure and reduced need for multiple inhalers.[12] In patients with persistent asthma symptoms despite treatment with ICS, budesonide-formoterol administered via a single DPI device has shown to be an effective and convenient treatment alternative.[11] The subgroup analysis of the COSMOS study from Asian countries demonstrated that the Budesonide-Formoterol maintenance and reliever regimen was associated with a lower future risk of exacerbations compared to Fluticasone-Salmeterol dose plus short-acting beta-2-agonist (SABA).[13]

Our survey showed that pulmonologists preferred budesonide-formoterol due to its quick onset of action, the proven potency of budesonide, and the safety of the combination. Several studies have shown that the preference for this combination from the patient's perspective is attributed to rapid treatment response and ease of use of a single inhaler twice daily. From the pulmonologist's perspective, the potency of budesonide, averting the undesirable discontinuation of ICS, and diminishing dependency on short-term reliever medication at the cost of reducing inflammation are important factors ascribed in published literature.[9,14]

The dose-dependent efficacy of ICS and LABA drug classes leads to the applicability of different strengths depending on disease severity. Therefore, the availability of multiple strengths is advantageous and affects the choice of ICS-LABA combination devices, as also found in our survey.

The primary adverse effects of LABAs are associated with their systemic effects, and therefore, some patients may experience tremors or palpitations.[15,16] This has led to pulmonologists being concerned about the cardiac safety of LABAs in our survey. Delivery of medication to the lungs depends on several factors, including inspiratory flow and particle size.[17] Our survey found that fine particle size and dose delivered were the most important attributes considered by pulmonologists when choosing inhalers (DPI/ MDI) for the treatment of patients with asthma. Particle size is an important aspect because it significantly affects the deposition region.[18] The use of ICS medications with a smaller particle size has been shown to offer added clinical benefits to patients with asthma compared with medications with particles of a standard size due to their ability to access the tinier airways, leading to improved clinical outcomes. Studies have reported that differences in the diameters of the ICS particles lead to variable degrees of improvement in clinical asthma symptoms.[18] Studies found that asthma treatment outcomes were similar or better with small-size particle ICS (budesonide) compared with standard-size particle ICS (fluticasone propionate).[17]

Spacers are frequently prescribed with MDI devices to improve medication delivery to the lungs. It reduces the impact of hand-breath coordination and local side effects such as sore throat, hoarse voice and opportunistic oral candidiasis infection due to reduced oropharyngeal deposition.[19] Besides this, the spacer devices made of antistatic materials increase the delivery of the respirable particle fraction, which otherwise may lead to a 50% reduction in aerosol dosage.[20]

CONCLUSION

In the current survey, asthma was found to be the most commonly diagnosed respiratory disease by participant pulmonologists. Given its heterogeneity, more than half of the participant pulmonologists preferred clinical manifestations and family history as means of initial diagnosis, while approximately a quarter combined these with Spirometry for confirmation. However, objective testing remains a challenge and clinical diagnosis takes precedence. The ICS-LABA combinations, which can be used both as maintenance and reliever, are the preferred therapy by pulmonologists, as also rightly recommended by the current GINA guidelines. Our survey demonstrated that among the multitude of ICS-LABA combinations, the preferred choice of pulmonologists was Budesonide-Formoterol. Combinations that are available in a variety of different strengths in a single inhaler device are favoured due to the flexibility of dose titration. Preference by pulmonologists is attributed to ease and convenience of use for the patients, which improves and ensures adherence. Additionally, as also shown by the survey, pulmonologists appeared to weigh most upon potency, rapidity, and safety when selecting ICS-LABA combinations. Since fine particle fraction per cent and magnitude of delivered dose dictate the therapeutic

efficiency, the choice of DPI and MDI devices is driven by these attributes.

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Ethical approval: Not required

REFERENCES

1. Sharma BB, Singh S, Sharma KK, Sharma AK, Suraj KP, Mahmood T, et al. Proportionate clinical burden of respiratory diseases in Indian outdoor services and its relationship with seasonal transitions and risk factors: The results of SWORD survey. PLoS One. 2022;17(8):e0268216.
2. Jindal SK, Aggarwal AN, Gupta D, Agarwal R, Kumar R, Kaur T, et al. Indian study on epidemiology of asthma, respiratory symptoms and chronic bronchitis in adults (INSEARCH). Int J Tuberc Lung Dis. 2012;16(9):1270-7.
3. Global Burden of Diseases Compare. Institute for Health Metrics and Evaluation. Viz Hub, 2021. Available at: https://vizhub.healthdata.org/gbd-compare/. Accessed 16 August 2022.
4. Singh S, Salvi S, Mangal DK, Singh M, Awasthi S, Mahesh PA, et al. Prevalence, time trends and treatment practices of asthma in India: The Global Asthma Network study. ERJ Open Res. 2022;8(2):00528-2021.
5. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2022. Available at: https://ginasthma.org/. Accessed 02 December 2022.
6. Kavanagh J, Jackson DJ, Kent BD. Over- and under-diagnosis in asthma. Breathe (Sheff). 2019;15(1):e20-7.
7. Acevedo-Prado A, Seoane-Pillado T, López-Silvarrey-Varela A, Salgado FJ, Cruz MJ, Faraldo-Garcia A, et al. Association of rhinitis with asthma prevalence and severity. Sci Rep. 2022;12(1):6389.
8. Zhang B, Li ZF, An ZY, Zhang L, Wang JY, Hao MD, Jin YJ, et al. Association between asthma and all-cause mortality and cardiovascular disease morbidity and mortality: a meta-analysis of cohort studies. Front Cardiovasc Med. 2022;9:861798.
9. Kuna P, Peters MJ, Manjra AI, Jorup C, Naya IP, Martínez-Jimenez NE, et al. Effect of budesonide/formoterol maintenance and reliever therapy on asthma exacerbations. Int J Clin Pract. 2007;61(5):725-36.
10. Kuna P. Treatment comparison of budesonide/formoterol with salmeterol/fluticasone propionate in adults aged >or =16 years with asthma: post hoc analysis of a randomized, double-blind study. Clin Drug Investig. 2010;30:565-79.
11. Goldsmith DR, Keating GM. Budesonide/formoterol: a review of its use in asthma. Drugs. 2004;64:1597-618.
12. Jiang P, Zhao L, Yao Z. Budesonide/formoterol versus salmeterol/fluticasone for asthma in children: an effectiveness and safety analysis. J Comp Eff Res. 2021;10(17):1283-9.
13. Vogelmeier C, Naya I, Ekelund J. Budesonide/formoterol maintenance and reliever therapy in Asian patients (aged ≥16 years) with asthma: a sub-analysis of the COSMOS study. Clin Drug Investig. 2012;32:439-49.
14. Sadatsafavi M, FitzGerald JM, O'Byrne PM, Soliman M, Sriskandarajah N, Vicente C, Golam SM. The cost-effectiveness of as-needed budesonide-formoterol versus low-dose inhaled corticosteroid maintenance therapy in patients with mild asthma in Canada. All Asthma Clin Immunol. 2021;17:108.
15. Guhan AR, Cooper S, Oborne J, Lewis S, Bennett J, Tattersfield AE. Systemic effects of formoterol and salmeterol: a dose-response comparison in healthy subjects. Thorax. 2000;55(8):650-6.
16. Saito T, Hasunuma T. Safety and tolerability of high-dose budesonide/formoterol via Turbuhaler® in Japanese patients with asthma: a randomized, double-blind, crossover, active comparator-controlled, phase III study. Clin Drug Investig. 2012;32:51-61.
17. El Baou C, Di Santostefano RL, Alfonso-Cristancho R, Suarez EA, Stempel D, et al. Effect of inhaled corticosteroid particle size on asthma efficacy and safety outcomes: a systematic literature review and meta-analysis. BMC Pulm Med.2017;17(1):31.
18. Murayama N, Asai K, Murayama K, Doi S, Kameda M. Dry Powder and budesonide inhalation suspension deposition rates in asthmatic airway-obstruction regions. J Drug Deliv. 2019;2019:3921426.
19. Hejazi ME, Shafiifar A, Mashayekhi S, Sattari M. Evaluation of proper usage of glucocorticosteroid inhalers and their adverse effects in asthmatic patients. Tanaffos. 2016;15(1):9-16.
20. Mitchell JP, Nagel MW. Valved holding chambers (VHCs) for use with pressurised metered-dose inhalers (pMDIs): a review of causes of inconsistent medication delivery. Prim Care Respir J. 2007;16(4):207-14.

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