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Editorial

Asthma management in India: Changing paradigms

Asthma is a common clinical problem with far-reaching impacts on global health. According to the Global Burden of Disease Study, over 34 million people in India suffer from asthma, amounting to approximately 13 per cent prevalence worldwide[1]. However, the rates of mortality and disability-adjusted life years due to asthma in India are threefold and twofold higher than the global rates, respectively. Such alarming findings are the consequence of issues related to the management of asthma in our country, including timely diagnosis and appropriate use of inhaled therapy. Herein, we briefly discuss these issues in the light of the evolving paradigms in asthma management.

Challenges in asthma diagnosis in India

The diagnosis of asthma is mainly based on clinical history and is supported by additional tests such as spirometry and peak flowmeter measurements. However, the non-availability or underuse of these diagnostic tools leads to underdiagnosis of asthma, especially in community settings[2]. In reality, the utilisation rates of spirometry and peak flowmetry for asthma diagnosis in India are dismally low, ranging between 9 and 18 per cent[3]. Unsurprisingly, a recent sub-analysis of the Global Asthma Network (GAN) Study found that asthma was undiagnosed in 82 per cent of chronic wheezers and 70 per cent of subjects with severe asthma symptoms in various urban centres in India[1]. This indicates an urgent need to enhance the public health capabilities to diagnose asthma in India with the help of physician education and the provision of essential diagnostic tools to the primary and secondary health centres. The peak flowmeter is an inexpensive and reliable diagnostic tool, which is listed among the World Health Organisation (WHO) package of essential non communicable disease interventions in primary care[4].

Finally, the stigma associated with a label of 'asthma' or '*damaa*,' as it is called in the local language, leads to a delay in diagnosis and treatment initiation[3]. There are many negative perceptions regarding inhaler use among the public, including fears of side effects and potential for addiction. Hence, patient education campaigns are needed to disseminate accurate information about asthma and dispel myths and misconceptions.

Management aspects – Has the time for anti-inflammatory reliever therapy arrived?

Currently, the first-line treatment of asthma involves inhaled medication, which includes a combination of reliever (relieves symptoms) and controller medication (reduces inflammation). However, several challenges persist in our ability to provide optimal asthma management, such as improper inhaler technique, inappropriate dosages, associated comorbidities that hinder asthma remission, and delayed recognition of warning signs leading to late presentation to the healthcare facility[3]. All clinicians need to convey the correct diagnosis and treatment plan for all patients with asthma, as non-communication of the correct diagnosis is associated with poor patient adherence. Since even mild asthma may lead to fatal exacerbations, a proper home management plan is necessary for all patients for early recognition of worsening disease and immediate management thereof[5].

Regarding pharmacotherapy, over the past few decades, the blue inhaler containing salbutamol has become the conventional reliever therapy for asthma symptoms. Various international guidelines had recommended it as the first step of treatment till 2018. Although short-acting beta-2 agonist (SABA) therapy (*e.g.*, salbutamol) effectively relieves acute asthma symptoms, it has no anti-inflammatory activity. Hence, SABA therapy does not target the underlying pathophysiology of asthma, thereby worsening airway inflammation[6]. Furthermore, there are concerns that SABA overuse downregulates beta-2 receptors, leading

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to decreased treatment responses over time[7]. There is ample evidence to suggest that SABA monotherapy in asthma is associated with increased risk of asthma exacerbation. In a study of over 365,000 asthma patients in Sweden, the use of greater than two canisters of SABA over one year was associated with a 26 per cent higher risk of mortality[8]. Almost 30 per cent of the study population overused SABA. Other investigators have reported that using SABA trains patients to rely on its short-term relief, precluding them from adhering to inhaled corticosteroids (ICS), even when these are offered[9].

In this context, the GAN study is alarming because it found that even amongst those diagnosed with asthma in India, less than 8 per cent used daily ICS, whereas almost 40 per cent used as-needed SABA[1]. Even more startling is the frequent use of oral bronchodilators with intermittent oral corticosteroid courses for asthma in many parts of India[10]. Even short bursts of oral corticosteroids can increase the risk of adverse events, including pneumonia, cataracts, and osteoporosis.

The drawbacks of SABA use as a reliever therapy provided the impetus for a growing body of research on the use of anti-inflammatory reliever therapy (AIR), *i.e.*, the combination of bronchodilator and ICS as reliever therapy[11]. The two common approaches for anti-inflammatory reliever therapy are the combination of formoterol (a bronchodilator with fast onset and long duration of action) with ICS, and the combination of a SABA with ICS (either in a single inhaler or in two different inhalers taken in quick succession). A major advantage of the former approach is using a single inhaler combination of ICS-formoterol as maintenance and reliever therapy (SMART). In a meta-analysis of five randomised controlled trials comprising 4863 patients, the use of the SMART approach (budesonide-formoterol as maintenance and reliever therapy) was found to delay the time to first asthma exacerbation compared to the use of ICS-long-acting beta-2 agonist (ICS-LABA) as maintenance therapy and SABA as reliever therapy[12]. Further, the SMART approach reduced the risk of moving to a higher Global Initiative for Asthma (GINA) treatment step.

In response to the evolving evidence, the GINA recognised the need for a paradigm change in the approach to reliever therapy in asthma. The GINA 2025 report does not recommend using SABA monotherapy for any step of asthma management in adults, adolescents, and children over the age of six years[13]. Further, the GINA offers two treatment tracks. In the preferred track, the GINA recommends using as-needed ICS-formoterol as reliever therapy for steps 1 & 2. Further, GINA recommends using ICS-formoterol as both maintenance and reliever therapy for steps 3 through 5. In the alternative track, the GINA permits the use of as-needed ICS-SABA as the reliever therapy at all steps of treatment. The use of as-needed anti-inflammatory reliever therapies in steps 1 and 2 underlines the growing recognition that symptom control may not always correlate with reduction of exacerbation risk, and even patients with mild asthma are at risk of life-threatening exacerbations[5].

No studies have directly compared these two tracks, *i.e.*, ICS-formoterol versus ICS-SABA as reliever therapy regarding important clinical outcomes. In this context, the recently published systematic review and network meta-analysis by Rayner *et al*[14] assumes significance. This study included 27 randomised clinical trials comprising 50,946 adult and paediatric patients studying different asthma reliever approaches: SABA alone, ICS-SABA, and ICS-formoterol. Consistent with previous studies, anti-inflammatory reliever therapies decreased the absolute risk of severe exacerbations: ICS-SABA led to a 4.7 per cent reduction. In comparison, ICS-formoterol led to a 10.3 per cent reduction. This implies a remarkable 'number needed to treat' (NNT) of only 10 patients for ICS-formoterol to prevent one severe exacerbation compared to SABA monotherapy. Furthermore, they performed a network meta-analysis to compare outcomes between ICS-SABA and ICS-formoterol. They found that the ICS-formoterol group had a 5.5 per cent reduction in risk of severe exacerbations compared to the ICS-SABA group. Additionally, both ICS-SABA and ICS-formoterol use were associated with modest improvements in symptom control compared to SABA monotherapy. Reassuringly, neither ICS-SABA nor ICS-formoterol was associated with increased risk of serious adverse events compared to SABA monotherapy.

These findings support GINA's preference for using ICS-formoterol as both maintenance and reliever therapy in asthma, pending head-to-head trials between ICS-formoterol and ICS-SABA. Importantly, GINA has noted that population-level decisions on the choice of reliever and maintenance therapy depend not only on the efficacy and effectiveness of these therapies in clinical trials, but also on the cost, availability, and patient preference. This is of vital importance to India, which is a leading manufacturer of generic

pharmaceuticals for both domestic and international consumption. The overwhelming evidence indicates that it is high time to discontinue the blue inhaler use in asthmatics for as-needed outpatient use in favour of anti-inflammatory reliever therapies[2]. The indications of SABA in asthma have narrowed to include mainly emergency and inpatient care of acute exacerbations. Hence, this is a call for action to update our national guidelines and generic drug formularies, increasing the availability of ICS-formoterol and ICS-SABA preparations in favour of SABA inhalers[15].

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References

1. 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* : 00528-2021.
2. Aaron SD, Boulet LP, Reddel HK, Gershon AS. Underdiagnosis and overdiagnosis of asthma. *Am J Respir Crit Care Med* 2018; *198* : 1012-20.
3. Swarnakar R, Dhar R. Call to action: Addressing asthma diagnosis and treatment gaps in India. *Lung India* 2024; *41* : 209-16.
4. Mortimer K, Reddel HK, Pitrez PM, Bateman ED. Asthma management in low and middle income countries: Case for change. *Eur Respir J* 2022; *60* : 2103179.
5. Kaplan A. The myth of mild: Severe exacerbations in mild asthma: An underappreciated, but preventable problem. *Adv Ther* 2021; *38* : 1369-81.
6. Gauvreau GM, Jordana M, Watson RM, Cockroft DW, O', Byrne PM. Effect of regular inhaled albuterol on allergen-induced late responses and sputum eosinophils in asthmatic subjects. *Am J Respir Crit Care Med* 1997; *156* : 1738-45.
7. Lohse MJ, Benovic JL, Caron MG, Lefkowitz RJ. Multiple pathways of rapid beta 2-adrenergic receptor desensitization delineation with specific inhibitors. *J Biol Chem* 1990; *265* : 3202-11.
8. Nwaru BI, Ekström M, Hasvold P, Wiklund F, Telg G, Janson C. Overuse of short-acting β2-agonists in asthma is associated with increased risk of exacerbation and mortality: A nationwide cohort study of the global SABINA programme. *Eur Respir J* 2020; *55* : 1901872.
9. Baggott C, Chan A, Hurford S, Fingleton J, Beasley R, Harwood M, *et al*. Patient preferences for asthma management: A qualitative study. *BMJ Open* 2020; *10* : e037491.
10. Salvi SS, Apte KK, Dhar R, Shetty P, Faruqi RA, Thompson PJ, *et al*. Asthma insights and management in India: Lessons learnt from the Asia Pacific - Asthma insights and management (AP-AIM) study. *J Assoc Physicians India* 2015; *63* : 36-43.
11. Kaplan A, Mitchell PD, Cave AJ, Gagnon R, Foran V, Ellis AK. Effective asthma management: Is it time to let the AIR out of SABA? *J Clin Med* 2020; *9* : 921.
12. Beasley R, Harrison T, Peterson S, Gustafson P, Hamblin A, Bengtsson T, *et al*. Evaluation of budesonide-formoterol for maintenance and reliever therapy among patients with poorly controlled asthma: A systematic review and meta-analysis. *JAMA Netw Open* 2022; *5* : e220615.
13. Global Initiative For Asthma. *2025 Global strategy for asthma management and prevention*. Available from: *https://ginasthma.org/2025-gina-strategy-report/*, accessed on May 21, 2025.
14. Rayner DG, Ferri DM, Guyatt GH, O', Byrne PM, Brignardello-Petersen R, *et al*. Inhaled reliever therapies for asthma: A systematic review and meta-analysis. *JAMA* 2025; *333* : 143-52.
15. Agarwal R, Dhooria S, Aggarwal AN, Maturu VN, Sehgal IS, Muthu V, *et al*. Guidelines for diagnosis and management of bronchial asthma: Joint ICS/NCCP (I) recommendations. *Lung India* 2015; *32* : S3-S42.