

THE ASTHMAID TOOL IN SINGAPORE: FOUR SIMPLE QUESTIONS TO DETECT PATIENTS IN NEED OF AN ASTHMA REVIEW BY A SPECIALIST

Dr Ong Jun Sheng Bennett, A/Prof Mariko Siyue Koh, Dr Maarten Beekman, Dr Julie Hales, A/Prof Tan Tze Lee

ABSTRACT

A rising prevalence of asthma in Singapore translates to a more considerable patient care burden for general practitioners. Along with diagnosing and managing the treatment of asthma, general practitioners must recognise when referral to a respiratory specialist is necessary. Although mild to moderate asthma is generally manageable in the primary care setting, patients with poorly controlled, difficult-to-treat, or severe asthma may benefit from referral to a specialist. Currently, many of these patients are not receiving optimal care, which places them at risk of asthma exacerbations and unnecessary systemic corticosteroid use. AsthmaID was developed as a tool for general practitioners to identify patients with asthma for whom a specialist evaluation could help improve asthma symptom control and optimise treatment strategies. Using four questions developed by asthma experts and rooted in the Global Initiative for Asthma report, AsthmaID quickly identifies patients who may benefit from a specialist referral without requiring additional patient assessments or testing modalities. Implementation of AsthmaID in clinical practice has the potential to transform the patient care pathway, thereby improving the quality of care for patients with asthma.

Keywords: Asthma, symptom flare-up, patient care, prevention and control, referral and consultation

DR ONG JUN SHENG BENNETT
Medical Affairs, AstraZeneca

A/PROF DR MARIKO SIYUE KOH
Senior Consultant
Department of Respiratory and Critical Care Medicine,
Singapore General Hospital
Adjunct Associate Professor
Office of Clinical & Academic Faculty Affairs, Duke-NUS

DR MAARTEN J. H. I. BEEKMAN
Respiratory & Immunology Medical Director, International
Region, AstraZeneca
The Hague, The Netherlands

DR JULIE HALES
PhD
Global Head of PRECISION, AstraZeneca
Cambridgeshire, England, United Kingdom

A/PROF TAN TZE LEE
Adjunct Associate Professor
Department of Medicine, NUS Yong Loo Lin School of
Medicine
President, College of Family Physicians Singapore

INTRODUCTION

The rising prevalence of asthma in Singapore combined with a high asthma-related mortality rate in comparison with other developed nations^{1,2} underscores a need to support general practitioners in optimising their identification and management of severe or uncontrolled asthma. Many patients with asthma, including those with severe disease, are treated in primary care.^{2,3} Whereas management in the primary care setting is often feasible for mild or moderate asthma, the diagnostic and management challenges associated with severe asthma make it more suited to specialist care.⁴ Indeed, more than 1 in 5 patients with severe, persistent asthma managed in the primary care setting in Singapore meet the criteria for poor asthma control.⁵ The severity of disease in patients with asthma is often under-recognised⁶ and the level of control overestimated.⁷ Although representing a minority of the general asthma population in Singapore, patients with severe, uncontrolled asthma account for a disproportionate amount of healthcare resource utilisation.⁸

Historically, systemic corticosteroids (SCS) have been a staple of asthma management.⁹ However, the introduction of inhaled corticosteroids, as well as other controller therapies and, more recently, the availability of biologic therapy options have relegated SCS to more limited use according to patient management recommendations.¹⁰ Nonetheless, 20 percent to 60 percent of patients with severe or uncontrolled asthma continue to receive long-term SCS treatment,⁹ which is associated with elevated mortality risk, increased risk of adverse outcomes, and higher healthcare costs.^{9,11,12} In addition, contrary to contemporary treatment recommendations, patients with asthma over-rely on short-acting beta₂-agonists (SABAs) for symptom relief.^{13,14} Rather than improve symptom control, SABA overuse increases the risk of exacerbations and asthma-related mortality.^{14,15}

Timely and appropriate referral to specialist care has been identified as a means to optimise therapy and minimise SCS exposure in patients with asthma.¹⁶ Implementing referral in clinical practice is challenging for multiple reasons, including the lack of consistent, established referral criteria.^{4,17} As a result, many patients with uncontrolled asthma treated in primary care are not referred to a specialist.¹⁷ Aside from the potential to reduce unnecessary SCS exposure, referral to a specialist for the care of severe asthma provides several potential benefits to patients, including access to multidisciplinary care teams, specialised testing, and phenotyping/endotyping (for example, through measurement of biomarker concentrations), all of which help to hone an individualised management strategy.^{4,18}

In this report, we describe a simple, 4-question tool that was developed to assist general practitioners in identifying patients with uncontrolled asthma who may benefit from a

referral to a specialist to optimise their asthma management.

ASTHMAID DEVELOPMENT

AsthmaID was developed as a tool to aid general practitioners in the evaluation of patients with asthma, in particular, to support the identification of patients with uncontrolled asthma who may benefit from referral to specialist care. AsthmaID was derived from a more sophisticated tool, conceived by Dr David J. Jackson (Guy's and St. Thomas' NHS Trust and King's College London, United Kingdom) for implementation in the United Kingdom's National Health Service environment, and developed via a collaboration with experts in asthma diagnosis and management (both specialists and general practitioners) as part of the AstraZeneca-supported PRECISION programme. PRECISION seeks to improve the quality of care for patients with severe asthma, a goal that includes transforming the patient care pathway.¹⁹ The individual components of AsthmaID are rooted in the global strategy for asthma management and prevention report developed by the Global Initiative for Asthma (GINA).¹⁰

Among the requirements for AsthmaID were that it: (1) takes into consideration time constraints for consultations in primary care, (2) allows for rapid identification of patients with uncontrolled disease, (3) generates a timely and appropriate specialist referral recommendation, and (4) provides the option to access additional guidance to help facilitate care optimisation, if appropriate. The initial, more sophisticated prototype was developed and tested in the United Kingdom in 2019 and underwent further refinement prior to its completion in 2020. A local adaptation of AsthmaID is currently being implemented in Singapore.

AsthmaID consists of four simple questions suitable for use in most primary care settings without the need for additional testing or patient assessments. The questions and the underlying rationale for inclusion are described below.

Question 1: Has the patient used two or more courses of SCS and/or is using maintenance SCS therapy over the past 12 months?

Rationale: According to the GINA report, maintenance SCS for the treatment of severe asthma is no longer a preferred option due to the associated serious side effects.¹⁰ Frequent use of SCS increases the risk of cardiovascular and endocrine complications such as hypertension and adrenal insufficiency, as well as skin thinning and bruising, proximal myopathy, and ocular complications, including glaucoma and cataracts.²⁰ The importance of limiting SCS exposure is highlighted by the finding that cumulative SCS exposure as low as 0.5g to <1g increases the risk of adverse outcomes.²¹ This degree of exposure is equivalent to three SCS courses of prednisone or prednisolone 30 to 40 mg/day for 5 to 7 days, which is a typical regimen used in the treatment of asthma exacerbations.¹⁰

One of the GINA criteria for defining uncontrolled asthma is the occurrence of two or more exacerbations in a year that require SCS treatment.¹⁰ Hence, a patient who has used two or more courses of SCS and/or is using maintenance SCS therapy over the past 12 months fits the definition of uncontrolled or difficult-to-treat asthma. Such patients should be referred to a specialist with asthma expertise for evaluation and optimisation of treatment, including consideration for steroid-sparing pharmacologic alternatives.

Question 2: Has the patient had two or more emergency attendances/unscheduled visits due to asthma over the past 12 months?

Among the indications for specialist referral cited by GINA is persistent or severely uncontrolled asthma or frequent exacerbations, which is indicated by, among other factors, frequent asthma-related healthcare utilisation (e.g., multiple emergency department visits or urgent primary care visits).¹⁰ Frequent healthcare utilisation is indicative of poor asthma control and portends unfavourable outcomes, including increased risk of exacerbations, hospitalisation, and mortality.^{22,23} Patients who have recurrent exacerbations, particularly severe exacerbations, are at higher risk of asthma-related death.²⁴

Referral to specialist care for patients with frequent exacerbations provides the opportunity for a thorough assessment of the underlying causes for the exacerbations, including the overall level of symptom control, risk factors, and triggers, which is an essential component of overall asthma management and aids in prevention efforts.¹⁰ Moreover, systematic assessment of severe asthma by dedicated severe asthma services has been shown to reduce exacerbations, decrease healthcare utilisation, improve overall asthma control, and bolster the patient quality of life.^{25,26}

Question 3: Has the patient ever been intubated or admitted to an intensive care unit (ICU) or a high dependency unit due to their asthma?

The GINA report suggests referral to a specialist for patients with any risk factors for asthma-related death, which includes those with a history of a near-fatal asthma attack, defined as requiring ICU admission or mechanical ventilation.¹⁰ Studies and audits of asthma deaths have consistently shown that patients with a previous severe, life-threatening asthma attack are at risk of asthma-related death and future severe, life-threatening asthma attacks.^{27,28} In a study of patients who were admitted to an ICU/high dependency unit in Singapore for a severe, life-threatening asthma attack, 17 percent (64 of 376) of patients had a previous history of ICU admission for asthma, and 15 percent of the survivors had another severe, life-threatening asthma attack during median follow-up duration of 52 months⁶, echoing previous findings.^{27,28}

Question 4: How many short-acting beta2-agonists (SABAs) inhalers have the patient used over the past 12 months?

The GINA report notes that regular or overuse of SABA is a risk factor for exacerbations.¹⁰ Use of three or more SABA canisters per year is associated with an increased risk of severe exacerbations and mortality risk.^{14,15} Overreliance on SABA should, therefore, be recognised by general practitioners as a sign of poor asthma control in these patients.¹⁰

Answering “Yes” to any of the first three questions or use of three or more SABA in response to question four indicates that referral to a specialist is appropriate for the patient.

ASTHMAID APPLICATION

A web-based interface has been developed for AsthmaID (www.asthmaID.sg) and is accessible to general practitioners in Singapore. Through the portal, clinicians can answer the four AsthmaID questions and access additional information regarding asthma management as well as download a summary report and create a referral letter.

It is important to note that, consistent with GINA recommendations, prior to determining that a patient has severe asthma, clinicians should ensure that the diagnosis of asthma is correct and that the symptoms are not attributable to other conditions; rule out modifiable causes of uncontrolled asthma including poor inhaler technique and poor asthma medication adherence, and confirm that triggers and comorbidities that could influence asthma symptoms are adequately managed.¹⁰

The following is a hypothetical patient case illustrating the application of AsthmaID to determine the need for referral of a patient with suspected severe asthma. Fiona is a 26-year-old Chinese female physiotherapist. She has a history of childhood asthma and has never smoked. Her family history is notable for a mother with asthma and a brother with eczema. She leads an active lifestyle with two young children and is health-conscious. She experienced three asthma exacerbations in the past year that were managed in the primary care setting, and each exacerbation was treated with a short course of SCS. She has no history of ICU admissions. Her current medications include a high-dose inhaled corticosteroid/long-acting beta-agonist, two puffs twice daily, for which she has demonstrated excellent inhaler technique and adherence. She uses approximately 12 puffs of her SABA inhaler a week and uses one new inhaler every two months (for a total of six in a year).

On examination, her body mass index is in the normal range. Respiratory examination reveals minimal wheeze on auscultation. Her clinical peak expiratory flow (PEF) rate is 85 percent predicted despite near maximal treatment.

Based on this hypothetical clinical scenario, the AsthmaID questions would be answered as follows:

1. Has the patient used two or more courses of SCS and/or is using maintenance SCS therapy over the past 12 months? *Response: Yes*
2. Has the patient had two or more emergency attendances/unscheduled visits due to asthma over the past 12 months? *Response: Yes*
3. Has the patient ever been intubated or admitted to an ICU or a high dependency unit due to their asthma? *Response: No*
4. How many SABA inhalers have the patient used over the past 12 months? *Response: Six canisters*

From the answers above, the AsthmaID algorithm concludes that it would be beneficial for the general practitioner to consider referring the patient for further evaluation by a specialist. An affirmative response to any of the questions one through three would trigger the referral recommendation, as would the use of three or more SABA canisters in the past 12 months. The online system would give the general practitioner the option of generating a referral letter that includes the indications for referral based on these responses, which facilitates patient triage and the transition in care.^{4,17}

CONCLUSION

General practitioners play an important role in the management of asthma. This role includes evaluating their patients to establish the severity of disease and degree of symptom control, as well as initiating a timely referral to a respiratory specialist when appropriate. AsthmaID is a simple resource for general practitioners that provides straightforward criteria for specialist referral, thereby expediting patient assessment and simplifying the care pathway.

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