

ASTHMA MANAGEMENT IN THE TIME OF COVID-19

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ABSTRACT

Asthma is a chronic inflammatory airway disease which results in variable expiratory airflow limitation. While there is currently no evidence that asthma increases the risk of COVID-19 or its severity of illness, new data emerges daily. This article outlines the recommendations by Global Initiative for Asthma (GINA), British Thoracic Society (BTS) and National Asthma Council Australia (NACA) which are relevant to primary care management of asthma in light of the COVID-19 pandemic.

Key Words

Asthma, COVID-19, Primary care, Exacerbation, Inhaled corticosteroids

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INTRODUCTION

Reports of a viral pneumonia caused by a novel coronavirus (severe acute respiratory syndrome coronavirus 2, SARS-CoV-2) first emerged in Wuhan, Hubei province of China in December 2019.¹ Over the next few months, the Coronavirus Disease 2019 (COVID-19) spread globally to involve more than 200 countries worldwide. The World Health Organisation (WHO) subsequently declared COVID-19 a pandemic on 11th March 2020.² As of 16th May 2020, there are more than four million confirmed cases worldwide with the number of deaths exceeding 300,000.³

Singapore's connectivity and role as Asia's major travel hub make it highly susceptible to the import of communicable diseases. Singapore's first imported case of COVID-19 was diagnosed on 23rd January 2020.⁴ While early cases were primarily imported, local community transmission began to occur since February 2020. The Singapore government has taken various measures to curb the spread of the virus within the community. On 7th April 2020, a "circuit breaker" was implemented to reduce movement and interactions in public and private places and it has since been extended to 1st June 2020.⁵ As of 16th May 2020, Singapore has recorded a total of 27,356 confirmed cases and 22 deaths due to the virus.⁶

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RELEVANCE TO ASTHMA PATIENTS

Viruses, in general, are known to be common causes of asthma exacerbations. The SARS-CoV-2 virus results in predominantly respiratory manifestations which range from uncomplicated upper respiratory tract infections to pneumonia and acute respiratory distress syndrome (ARDS). As such, it is expected that having an underlying respiratory condition such as asthma may increase the risk of COVID-19 and severity of illness. However, various studies have shown that asthma was underrepresented in the comorbidities reported for patients with COVID-19.⁷⁻⁹ There is currently no clear evidence to show that asthma is a risk factor for COVID-19, the severity of illness or its related complications.¹⁰ Some in vitro models have shown that inhaled corticosteroids alone or in combination with bronchodilators may suppress coronavirus replication and cytokine production.¹¹

The difficulty in diagnosis of COVID-19 is recognised in the primary care setting as symptoms of the infection may resemble that of other conditions. Table 1 summarises the common symptoms and differentiating points between COVID-19, the common cold, the flu and seasonal allergies. Other pertinent histories would include thorough travel and contact history.

MANAGEMENT OF ASTHMA PATIENTS IN THE TIME OF COVID-19

The current literature including guidelines published from three major groups – Global Initiative for Asthma [GINA]¹², British Thoracic Society [BTS]¹³ and National Asthma Council Australia [NACA]¹⁴ was reviewed. The main recommendations have been summarised in point form for easy reading and application to real-life practice (refer to Table 3). They should be applied in conjunction with the current standard of care for asthma.

Spirometry should be avoided

Spirometry is the most frequently performed pulmonary function test and is important in the diagnostic evaluation of respiratory disease. It however, involves a forced expiratory manoeuvre which may aerosolise and spread infectious droplets. As such, it is advised to avoid spirometry testing in patients with suspected or confirmed COVID-19. If patients are to proceed with spirometry, only spirometers with inline filters should be used.

All patients should have an up-to-date Written Asthma Action Plan (WAAP)

If patients in exacerbation are not unwell enough to warrant a healthcare visit or seek treatment in hospital, they should be advised to follow their WAAP and take their medications as guided. However, COVID-19 may present similarly to an asthma attack (e.g. cough, dyspnoea) and thus patients should

be advised to seek medical attention if they experience atypical symptoms e.g., prolonged duration of illness, fever, and anosmia.

Avoid the use of nebulisers to administer inhaled medications

The use of nebulisers carries a risk of transmitting viral infections due to aerosolisation of infectious droplets which may travel for several metres and remain suspended in the air for more than 30 minutes. If a patient with suspected or confirmed COVID-19 requires treatment with salbutamol for an acute exacerbation of asthma, a metered-dose inhaler (MDI) and spacer with well-fitted face mask can be used to deliver the medication as effectively. Table 2 shows the equivalent doses of nebulised and MDI delivered salbutamol.

If the use of a nebuliser cannot be avoided, the patient should be isolated in a single negative pressure room. Healthcare workers administering the nebuliser should wear full personal protective equipment (PPE), i.e. a water-resistant gown, gloves, N95 mask and protective eyewear. This precaution should be continued at least 30 minutes after the nebuliser treatment is completed. Inhaler devices and spacers should not be shared amongst patients or family members.

Inhaled corticosteroids (ICS) should be continued in all asthma patients

ICS is the most effective controller medication for the treatment of asthma. ICS have been shown to reduce the frequency and severity of exacerbations as well as mortality.^{15,16} All patients, including those suspected or confirmed to have COVID-19, should be advised to continue their usual ICS as stopping the medication would increase the risk of acute exacerbations, including those triggered by viral infections. There is no evidence currently to show that the use of ICS increases the risk of COVID-19.

Oral steroids should be administered when indicated

Systemic corticosteroids should be avoided in patients with suspected or confirmed COVID-19 due to the potential to prolong viral replication and delay clearance, as previously demonstrated in SARS and MERS.¹⁷ However, if a patient with asthma has symptoms and signs of an acute asthma exacerbation, short courses of oral steroids (five to seven days) should still be prescribed as per standard of care. Asthma patients on oral maintenance corticosteroids should be continued on the lowest possible dose. Cessation of steroids in this group of patients may precipitate acute exacerbations. Biologic therapies can be considered for severe asthma patients who qualify for them in order to limit systemic corticosteroid burden.

Minimise face-to-face contact and utilise teleconsultation when possible

Non-essential face-to-face appointments should be cancelled in line with social distancing measures, to minimise the risk of

virus transmission. Consultations should be made via telephone, video or email where possible. Postal services or delivery services can be utilised to deliver prescriptions and medications to ensure patients have an adequate supply.

If a face-to-face appointment is required, patients should be screened on the day of the appointment to ensure that they do not exhibit symptoms of COVID-19. Patients should be encouraged to attend the appointment alone or with no more than one family member or caregiver. Waiting areas should be organised to ensure patients can comply with social distancing from other patients and clinic administrative staff.

CONCLUSION

The COVID-19 pandemic has affected millions of people worldwide, and our asthma patients are also vulnerable. The main recommendations from GINA, BTS and NACA are summarised to help guide primary care professionals in managing asthma patients during this period. We await more evidence-based recommendations as our understanding of COVID-19 evolves with the emergence of new studies.

Author contributorship

NYS contributed to interpretation, drafting, revising and final approval of the work. MSK contributed to the conception, interpretation, drafting, revising and final approval of the work. Both NSY and MSK are fully accountable for all aspects of the work.

Declaration of Conflicts of Interest

The authors declare that they have no conflict of interest in relation to this article.

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Table 1. Differentiating COVID 19 infection and other common conditions
(used with permission from the Asthma and Allergy Foundation of America)

Symptoms	Coronavirus* (COVID-19) Symptoms range from mild to severe	Cold Gradual onset of symptoms	Flu Abrupt onset of symptoms	Seasonal Allergies Abrupt onset of symptoms
 Length of symptoms	7-25 days	Less than 14 days	7-14 days	Several weeks
 Cough	Common (usually dry)	Common (mild)	Common (usually dry)	Rare (usually dry unless it triggers asthma)
 Shortness of breath	Sometimes	No**	No**	No**
 Sneezing	No	Common	No	Common
 Runny or stuffy nose	Rare	Common	Sometimes	Common
 Sore throat	Sometimes	Common	Sometimes	Sometimes (usually mild)
 Fever	Common	Short fever period	Common	No
 Feeling tired and weak	Sometimes	Sometimes	Common	Sometimes
 Headaches	Sometimes	Rare	Common	Sometimes (related to sinus pain)
 Body aches and pains	Sometimes	Common	Common	No
 Diarrhea	Sometimes	No	Sometimes for children	No
 Chills/repeated shaking	Sometimes	No	Sometimes	No
 Loss of taste or smell	Sometimes	Rare	Rare	Rare
<p>Your symptoms may vary. *Information is still evolving. **Allergies, colds and flus can all trigger asthma, which can lead to shortness of breath. COVID-19 is the only one associated with shortness of breath on its own.</p> <p>Sources: Asthma and Allergy Foundation of America, World Health Organization, Centers for Disease Control and Prevention. edited 4/29/20 • aafa.org/covid19</p>				

Table 2. Equivalent doses of nebulised and MDI salbutamol (BTS¹³)

Nebulised salbutamol	MDI salbutamol via spacer with 2-3 tidal breaths
2.5mg	4-6 puffs
5mg	10-12 puffs

Table 3: Summary of Major Asthma Guidelines in Relation to COVID-19

Recommendation	Global Initiative for Asthma (GINA) ¹²	British Thoracic Society (BTS) ¹³	National Asthma Council Australia (NACA) ¹⁴	Possible alternatives to consider
Diagnosis				
Avoid spirometry in view of risk of aerosolisation	✓		✓ Also suggests not to perform peak expiratory flow on patients with fever or acute respiratory infection	Document peak expiratory flow rates (PEFR) before and after starting ICS. If there is an increase in PEFR >20% from baseline, this confirms variable airflow limitation (GINA 2020)
Treatment and management				
Provide Written Asthma Action Plan (WAAP)	✓	✓	✓	
Nebulisers should be avoided to minimise the risk of aerosolised droplet transmission	✓	✓	✓	Use metered-dose inhaler (MDI) with spacer instead to administer salbutamol
Continue inhaled corticosteroids	✓	✓	✓	
Oral corticosteroids should be given in acute exacerbation (short course 5-7 days)	✓	✓	✓	
Continue oral maintenance corticosteroids at the lowest dose	✓	✓	✓	
Continue regular vaccinations i.e. influenza and pneumococcal	✓		✓	
Ensure sufficient supply of medications		✓	✓	
Minimise face-to-face contact and overcrowding in clinic			✓	Consider video/telephone consultations in line with MOH guidelines ¹⁸