

PROTECTING ASTHMATICS FROM COVID-19

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ABSTRACT

The coronavirus disease 2019 (COVID-19) is caused by a severe acute respiratory syndrome 2 virus (SARS-CoV-2). Infections were first detected in Wuhan, China in late 2019 and the infection has recently spread worldwide and been declared a pandemic by the World Health Organization. The disease presents with a spectrum of respiratory manifestations that range from asymptomatic cases, to patients with mild and severe symptoms, either with or without pneumonia. Symptoms include fever, upper respiratory tract coryza, cough and acute lower respiratory tract infection. Asthmatics have, thus far, only shown slightly higher risk for hospitalisation but not for mortality. However, this may change in South Africa. Asthmatics are advised to keep their asthma under control and to continue using controller medication. It is critical for all of us, especially asthmatics, to practice 'social distancing', wash hands frequently and practise sneeze and cough etiquette.

Keywords: Coronavirus disease 2019, COVID-19, asthma, severe acute respiratory syndrome

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome coronavirus 2 virus (SARS-CoV-2). Infections were first detected in Wuhan, China in late 2019 and the infection has recently spread worldwide and been declared a pandemic by the World Health Organization (WHO).¹ The disease may present in many ways, ranging from asymptomatic cases to patients with severe symptoms, either with or without pneumonia. Most patients will present with mild symptoms. Symptoms include fever, upper respiratory tract coryza, cough and acute lower respiratory tract infection.

Coronaviruses have been known as respiratory viruses for many years and probably date back for thousands of years. Every year they cause upper and lower respiratory tract infections, mostly in winter. They may cause more severe lower respiratory tract infections in young children, the elderly and people with underlying chronic lung conditions.

Because this virus is a ribonucleic acid (RNA) virus, it does not have the genetic checks and balances to remain stable over successive replications. This causes mutations into more virulent viruses which cause epidemics, as was the case with SARS virus in the early 2000s and the Middle East Respiratory Syndrome (MERS) virus in the Middle East. These viruses are extremely virulent, and can cause havoc in populations because of their remarkable ability to undergo mutations in a very short time frame. This allows for human-to-human spread and makes the disease more severe.

Coronaviruses are naturally found in bats and pangolins (which is the likely source of the new virus) and other animals as well. The viruses affect humans once they attain a virulence characteristic which can survive in human beings. The annual transmission of common coronaviruses is probably contained because of limited human-to-human spread. This has changed with the COVID-19 pandemic. The Centre for Disease Control (CDC) presumes that symptoms may appear between two and 14 days in a patient who has had exposure.²

Thus far, a review of all patient cases that have met the case definition for being COVID positive, suggest that the elderly and men (more than women) are more affected, however, the latter suggestion has not been consistent in all serial studies.^{3,4} In the United States, more young adults are being hospitalised.

Cardiovascular, gastrointestinal and endocrine comorbid conditions have been reported as risk factors. Previous chronic pulmonary diseases (eg, chronic obstructive pulmonary disease (COPD), asthma, bronchiectasis) were surprisingly underreported.^{1,3,4} Dyspnoea, myalgia and fatigue were the most commonly reported symptoms in patients. Fever was invariably present in all patients.^{3,4} Multiple bilateral lobar areas of consolidation or bilateral ground-glass opacities were the commonest radiological changes of 2019-nCoV.^{3,4}

Patients with common allergic diseases did not develop unusual or more severe symptoms.¹ Individuals who had COPD were more likely to develop a secondary bacterial pneumonia and more severe disease.

Lymphopaenia (75.4%) and eosinopaenia (52.9%) were observed in patients.⁴ Blood eosinophil counts correlated positively with lymphocyte counts in severe ($r = 0.486$, $P < 0.001$) and non-severe ($r = 0.469$, $P < 0.001$) patients after hospital admission. Significantly higher levels of D-dimer, C-reactive protein and procalcitonin were associated with severe disease compared to non-severe patients ($P < 0.001$ for all testing).⁴

Patients and individuals considered to be infected should be strictly quarantined for the efficient containment of the pandemic.

Testing for coronavirus employs a commercial RT-PCR kit first developed by the Beijing Genomic Institute but now produced widely across the world. The probable earliest Phase 1 vaccine trial is based on a synthetic DNA-based candidate. A number of novel compounds, as well as therapeutics licensed for other conditions appear to have in vitro efficacy against the 2019-nCoV. Some were being tested in clinical trials against MERS-CoV and SARS-CoV, whereas others have been listed for clinical trials against 2019-nCoV. However, there are currently no effective specific antivirals or drug combinations supported by high-level evidence.⁵

A Chinese group has suggested that the nutritional status of each infected patient should be evaluated before the administration of general treatments and the current children's RNA-virus vaccines, including an influenza vaccine, should be administered to uninfected individuals and healthcare workers. In addition, convalescent plasma should be given to COVID-19 patients if it is available. In conclusion, they suggest that all the potential interventions be implemented to control the emerging COVID-19, if the infection is severe or uncontrollable.⁶

A number of therapies have shown promise in severe disease but none have been through testing in this condition.⁷ There are a number of sensationalist claims that antibiotics, anti-retrovirals and anti-'flu' drugs help, but that is not yet scientifically proven. It is important that routine antibiotics are not prescribed for patients with milder viral infections. The risk here is the dual threat to antimicrobial resistance and dysbiosis of the microbiome.⁸

The prevention of COVID-19 revolves around 'social distancing' and avoiding contact with sick people, avoiding having people cough or sneeze on one another and hand washing after touching a sick person, after going to the toilet and after touching public surfaces. It is very important that we all practise cough and sneeze hygiene! Individuals are advised that:

If you get sick, it is important to see your doctor or go to a hospital. Notify your fellow health care team if you suspect coronavirus, as they have been in close contact with you.

SPREAD OF THE CORONAVIRUS

The virus is spread in respiratory droplets through coughing (or sneezing). These are heavy droplets that quickly settle to the ground or any surface below.

Droplets may reach 1–2 metres from a sneeze or a cough. It is recommended that everyone should cough/sneeze into their elbows or a tissue and then throw it away and wash their hands.

People who are sick and healthcare practitioners should also wear a mask to help prevent the spread of illness.

The coronavirus may also survive in the air for up to eight hours and on surfaces for up to six days.²

COVID-19 IN ASTHMATICS

At this time, there is limited data on the effects of this coronavirus in individuals with asthma. Three studies of cases to date have demonstrated no link to asthma.^{1,3,4} However, the disease may well evolve to infect asthmatics and produce more severe disease, as with other viruses, such as other coronaviruses and influenza.

An initial review of USA COVID-19 cases of people with underlying conditions shows that people with chronic lung disease, including asthma, may be at higher risk of hospitalisation for COVID-19.⁹ However, early data from New York State suggests people with asthma have a lower death rate if they do get COVID-19.¹⁰ According to the WHO and CDC, the highest risk groups include:^{9,11}

- people caring for someone who is ill with COVID-19;
- people over age 65;
- people who live in a nursing home or long-term care facility;
- people who are pregnant;
- people with chronic medical conditions, especially if they are not well-controlled, such as:
 - people with a body mass index over 40;
 - serious heart conditions;
 - diabetes;
 - chronic kidney disease and on dialysis;
 - liver disease;
 - immunocompromised people, such as those on cancer treatments;
 - asthma (and other lung diseases).

GENERAL PRINCIPLES TO PREVENT ASTHMA EXACERBATIONS FROM COVID-19

Individuals with asthma should take precautions when any type of respiratory illness is spreading in their community. Two key components to prevent asthma exacerbations are maintaining asthma control and avoiding coronavirus (and other respiratory infections).

The most important advice to asthmatics in order to protect themselves is to keep their asthma under control.

A useful strategy for asthma clinics and clinic staff in this time of 'social distancing,' as it applies to routine clinic visits, is to use a designated cellphone to call patients. During these calls you may allow the following discussions:

- How is your, or your child's, asthma control? (Five control questions);
- Make sure you continue to use your controller medication;
- Do you know which is your controller medication?;
- Do you have a fever or a sore throat and cough? (consider screening for COVID-19);
- Remember to come to clinic to collect a repeat script for medication;

- Remember to use your action plan if you get asthma symptoms;
- Keep this cellphone number for any questions you may have.

Patients should absolutely continue their controller therapy, which will usually include an inhaled corticosteroid. There is no evidence to suggest that inhaled corticosteroids would alter the outcome should the asthma patient become infected with coronavirus. To ensure continued treatment, patients may have to stock up with supplies (a 14- to 30-day supply).¹²

ADVICE FOR ASTHMATICS TO AVOID CORONAVIRUS

The common steps individuals take to avoid influenza and other respiratory infections will also protect them from the coronavirus:

- take steps to keep a distance from others (social distancing, about 1.8 m);
- avoid people who are sick, limit close contact and wash your hands often;
- avoid crowds as much as possible;
- avoid non-essential travel;
- clean and disinfect your home and car regularly, especially items you touch often such as doorknobs, light switches, cellphones, car door handles and steering wheels;
- wash your hands often with soap and warm water for 20 to 30 seconds, and always after coughing or sneezing. If there is no access to running water, individuals are advised to use an alcohol-based hand cleanser that contains at least 60% alcohol;
- do not touch your eyes, nose or mouth;
- do not share makeup, food, dishes or eating utensils;
- disinfect surfaces, taking care to avoid disinfectants that produce asthma exacerbations;
- in the case of an outbreak in a local community, the CDC recommends that asthmatics stay home and find ways to have food and supplies delivered to their home.

Asthmatics who also have eczema should get advice on how to protect eczematous skin when washing frequently.

The CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (eg grocery stores and pharmacies) especially in areas of significant community-based transmission. The cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders.

Mental Health America (MHA) has produced a list of tips to help people cope with anxiety. These ideas include:¹²

- Making sure you are looking after yourself, so you feel more able to cope with whatever happens;
- Watching out for bad habits such as increasing your alcohol consumption. Try to ensure you are getting some exercise;
- Consulting only reliable sources of information;
- Staying connected to friends and family and talking about your worries.

MANAGEMENT OF ACUTE ASTHMA IN TIMES OF COVID-19

Mild asthma exacerbations may be managed at home with the telephonic advice of the treating doctor. Patients and doctors can agree on which therapy should be used and write this down in an asthma action plan. Older patients (> 6 years) with difficult-to-control symptoms could benefit from a peak flow meter, because it will help to differentiate between asthma symptoms and COVID-19 symptoms.

All severe asthma exacerbations, irrespective of cause, require the three principles of treatment advocated in guidelines to be practised, namely: oxygen, systemic steroids and increased bronchodilator use. Oral steroids are not contraindicated in viral exacerbations.¹³

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	Sometimes	Sometimes	Common	Sometimes
Headaches	Sometimes	Rare	Common	Sometimes (related to sinus pain)
Body aches and pains	Sometimes	Common	Common	No
Diarrhea	Rare	No	Sometimes for children	No

*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. Sources: Asthma and Allergy Foundation of America, World Health Organization, Centers for Disease Control and Prevention

Figure 1: Differentiating respiratory illnesses²

Strategies that may be wise to employ in the period of COVID-19 are to limit nebuliser therapy as well as high-flow oxygen therapy to avoid droplet spread.

DISTINGUISHING COVID-19 FROM OTHER COMMON ILLNESSES

Many respiratory illness may present with symptoms similar to coronavirus. The chart in Figure 1 provided by the Asthma and Allergy Foundation of America (AAFA) may be useful in distinguishing between them.²

OTHER VIRAL DISEASES IN A TIME OF COVID-19

Unfortunately, COVID-19 will overlap with seasonal upper and lower respiratory tract infections in both adults and children. In South Africa, the autumn period is characterised by paediatric bronchiolitis caused by RSV and rhinovirus and its end marks the beginning of influenza.¹⁴ These conditions may be indistinguishable clinically from COVID-19. A high index of suspicion is required and the cohorting of respiratory patients in hospitals will be essential.

What about influenza? While this new virus is frightening, we have shifted our focus away from other serious and more real problems in paediatrics. So far, influenza has hospitalised millions of Americans and killed approximately 10 000, including hundreds of children. Influenza is just as deadly, if not more so. And each year many South Africans fall ill with influenza and die from the complications. High risk individuals - the children, the elderly, people with chronic illness and health care workers – should get an annual influenza vaccine. It may just save their life!

We should remember that this year's severe influenza outbreak in the United States was mainly driven by B strains. It is highly recommended that this year's vaccine contain two B strains.¹⁵

CONCLUSION

South Africa does have COVID-19 cases (40792 cases as of 5 June 2020). There have been 848 deaths, but that number will almost certainly rise. Initial cases were being traced back to international travellers or those who have had contact with travellers, but local transmission is now occurring. While the number of paediatric cases reported from around the world is reassuring minimal, the special South African demographics may not allow us the same surety. Children are not spreaders of the virus and, fortunately, do not often get sick. In China, only one child has died from COVID-19.

The world is in a panic and economies are stretched to the brink. Hospitals in some countries are working beyond capacity. South Africa has a well-thought-through plan of action. There is no vaccine yet and no cure. None of the remedies that have been reported by the media have yet been shown to work. The only important prevention strategies are 'social distancing' and frequent hand washing. That means that all of us should really limit contact with others (do not shake hands and do not cough or sneeze on or near someone). If we can stop the virus spreading today and tomorrow by limiting our social contact, we have a much better chance of containing the virus.

The evidence so far, is that asthmatics are not at special risk, but that may change. Asthmatics should continue to take routine inhaled-controller therapy and manage exacerbations according to an 'action plan'. Managing acute asthma requires the usual strategies of therapy but limiting aerosol generation.

Be safe everyone, and make others safe.

Because this article was written in June 2020, information may change. We will try to post a brief update on the journal website should this happen.

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Resources

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- <https://www.asthma.org.uk/advice/triggers/coronavirus-COVID-19/>
- <https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/asthma.html>