

## Global Asthma Report 2022

### Chapter 6 COVID-19 and asthma

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In December 2019, a cluster of pneumonia cases caused by an unknown pathogen was noticed in Wuhan, China. Deep sequencing analysis of samples from lower respiratory tract revealed a novel coronavirus which was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 mainly affects adults. Children and adolescents are less likely to have severe COVID-19. A summary of 44,672 confirmed COVID-19 cases reported in February 2020 by the Chinese Center for Disease Control and Prevention revealed that 90% of these cases were 30 years or older and only 1% were 9 years or younger. The case-fatality rate was 2.3% overall, 8% in patients aged 70-79 years, and 14.8% in patients aged  $\geq 80$  years; but no death in those aged 9 years or younger.

During the pandemic of COVID-19, children with asthma experienced fewer upper respiratory tract infections, emergency visits, asthma attacks, and hospitalizations due to asthma, probably due to public health interventions leading to reduced exposure to asthma triggers. Clinical manifestations of COVID-19 among children with asthma have rarely been reported. It is unclear whether SARS-CoV-2 is associated with exacerbations of asthma.

#### Global Asthma Network (GAN) survey on COVID-19 among children with asthma

To improve the global understanding of COVID-19 and childhood asthma, the GAN Steering Group conducted a survey among its worldwide network on clinical manifestations and outcomes of infection with SARS-CoV-2 among children with asthma. A standardized questionnaire was developed and sent to 133 centres from 59 countries in November 2020. Data collection closed on 28<sup>th</sup> April 2021. The sampling frame included asthmatic children who had been tested in contact examinations, in a clinical practice or in a hospital of the participating centres. All asthmatic children who tested positive for SARS-CoV-2 were included, regardless of symptoms.

Fourteen GAN centres from 10 countries (Argentina, Belarus, Brazil, Greece, Guatemala, Iran, Kyrgyzstan, the Kingdom of Saudi Arabia, Spain, and Sudan) provided data on 169 asthmatic children infected with SARS-CoV-2 confirmed by reverse transcription polymerase chain reaction tests.

#### Findings of the GAN survey

Of the 169 children, 111 (65.7%) were symptomatic and 76 (45.0%) had a body temperature  $>37.5$  °C. Common symptoms included cough, headache, rhinorrhoea, fatigue, and smell reduction. Thirty-eight (22.5%) patients had exacerbations of asthma associated with SARS-CoV-2 infection; 53 (31.4%) had a change of asthma medicines. COVID-19 was asymptomatic in 58 (34.3%), mild in 93 (55.0%),

moderate in 14 (8.3%) and severe/critical in 4 (2.4%). Twenty-one (12.4%) patients had been hospitalized for a median of seven days.

Adolescents aged 14 years or older were significantly more likely to be symptomatic than children aged under 10 years. Use of inhaled bronchodilators was significantly associated with being symptomatic, but use of inhaled corticosteroids (ICS) or use of a combined inhaler were not. Those who used inhaled bronchodilators were significantly more likely to have moderate or more severe COVID-19 as compared to those who did not. The proportion of patients with moderate or more severe COVID-19 among those who used ICSs was not different from that among those who did not use ICS.

Those who had moderate or more severe COVID-19 were significantly more likely to have had an exacerbation of asthma as compared to those who were asymptomatic or had mild COVID-19. Use of ICS and other asthma medicines were not associated with asthma exacerbations.

Factors significantly associated with hospitalization included comorbidity, use of inhaled bronchodilators and moderate or more severe COVID-19. Use of ICS, use of a combined inhaler and use of leukotriene receptor antagonist (LTRA) were not associated with hospitalization.

#### Other COVID-19 studies among children with asthma

Various studies have reported that the proportions of COVID-19 cases who were asymptomatic among children were 13% - 28%; and the proportion of moderate or more severe COVID-19 were 21% - 65%. The GAN COVID survey revealed that children with asthma did not have high morbidity of COVID-19, although a small proportion had severe/critical disease.

A substantial proportion of asthmatic children had exacerbations of asthma and a considerable proportion had a change of asthma medicines associated with infection with SARS-CoV-2. However, the severity of COVID-19 was significantly associated with exacerbations of asthma and a change of asthma medicines. Whether symptoms leading to a change of asthma medicines were caused by COVID-19 or due to exacerbations of asthma was less clear.

The GAN survey has revealed that the use of inhaled bronchodilators was associated with being symptomatic, having more severe COVID-19, having a change of asthma medicines and being hospitalized. Whether this was because those who used inhaled bronchodilators have more severe asthma than those who did not use inhaled bronchodilators needs further investigation. However, the use of ICS was not associated with severity of COVID-19, exacerbations of asthma, a change of asthma medicines and hospitalization in children infected with SARS-CoV-2. This finding clearly supports the recommendation of continuation of the use of ICS among patients with asthma.

#### Key recommendations

Children with asthma who are using ICSs for asthma control should continue the use of ICS in the era of COVID-19.

#### Key facts

The use of ICS is not associated with severity of COVID-19, exacerbations of asthma, a change of asthma medicines and hospitalization in children infected with SARS-CoV-2.

#### References

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