

Asthma in children during the COVID-19 pandemic: lessons from lockdown and future directions for management



Shamefully, children still die from asthma,¹ and UK asthma outcomes are among the worst in Europe.² COVID-19 has wreaked havoc across the globe, and the world is having to re-evaluate almost every aspect of the daily living we took for granted in 2019. What has COVID-19 taught us about asthma in children? What are the implications for asthma management in children and for the asthma community as lockdowns are eased?

COVID-19 is generally a mild disease in children compared with adults, and although a few children get a severe respiratory or systemic disease, most do not need intensive care.³ As a respiratory virus, we might expect severe acute respiratory syndrome coronavirus 2, which causes COVID-19, to increase asthma attacks; however, Kenyon and colleagues⁴ reported a 76% drop in emergency visits for asthma of all severities during the COVID-19 pandemic, a similar drop to our own UK experience. Substantial falls have also been noted in visits for non-asthma respiratory and endocrine diagnoses and for trauma. This decrease in emergency visits is unlikely to be accounted for simply by parents managing mild attacks at home, but the causes for what is clearly a relevant change are uncertain. Reasons could include lockdown preventing transmission of conventional respiratory viruses, such as rhinovirus and respiratory syncytial virus, and reduced exposure to outdoor allergens. Another factor could be the striking reductions in atmospheric pollution,⁵ a well established factor in asthma attacks.⁶ It is also possible that parental supervision of asthma drugs, leading to better adherence, is a factor.⁷ Research is needed to identify the contributing factors and to underpin future measures.

The societal challenge is that these huge reductions in asthma attacks have been achieved not with expensive new drugs but by behavioural changes. Can we maintain these post COVID-19? At the very least, we need to challenge ourselves about being more rigorous in preventing transmission of respiratory viruses. Before the COVID-19 pandemic and lockdowns around the world, most parents will have dosed their offspring with paracetamol and left them shedding respiratory viruses in the childcare facility. Do we need to be more ready to keep our children at home and stay off work, irrespective

of whether they have asthma? More evidence is needed to study the wider implications of this behaviour for the child and family. There is also a need for sustained efforts to reduce air pollution globally.

During the COVID-19 pandemic, not only has the frequency of asthma attacks changed but also asthma management has been transformed, with virtually all routine checks in secondary and tertiary care being done remotely. This adjustment to practice has been facilitated by advances in home monitoring of lung function, which can be directly observed by a physiologist from the hospital. Home self-administration of biologicals can also be directly observed by mobile telephone. Remote consultation clearly has many advantages that will be important going forward, including minimising cross-infection risk, which is likely to be a long-term issue, and reducing disruption to normal life. However, there are frequently safeguarding concerns in children with severe asthma⁸ that are difficult to assess remotely. Moreover, occasions will arise when a face-to-face consultation is needed, typically to do advanced tests such as histamine challenge or skin prick. But the future default should be remote consultation, not face-to-face meetings.

Up to now, we have had to improvise, but telemedicine has gained huge momentum during the COVID-19 pandemic, and now we need to make ambitious plans. Preventable asthma deaths are still happening, and major factors include underuse of inhaled corticosteroids, overuse of short-acting β_2 agonists, and above all, an asthma attack being treated as an isolated event instead of a red flag predictive of high future risk.^{9,10} The imperative is to design remote monitoring systems not only to optimise distance outpatient consultations but also to improve outcomes.

Routine outpatient monitoring includes height, weight, spirometry, exhaled nitric oxide (in some cases), and physical examination including chest auscultation; all these measurements can be done at home. We have the technology for electronic stethoscopes on mobile telephones. Electronic dose counters for inhalers are also available, which could be used to identify underuse of inhaled corticosteroids and overuse of short-acting



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β 2 agonists with remote Bluetooth technology. Our mobile telephones record where we have shopped and where we have dined, and they could potentially be used to record any unscheduled health visits, mandating an asthma review, with the permission of the family. We would need to devise an alert system so that contact is immediately made if agreed thresholds were met.

Remote collection of this information for all children with more than trivial asthma, combined with individual and societal behavioural change, could potentially reduce asthma attacks and improve outcomes. The challenge is to improve clinical practice post COVID-19, not default to the past.

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