Allergy: A Boon in COVID Era?

Sunita Chhapola Shukla
Senior ENT Surgeon and Chief Allergist, MBPTH, Honorary Consultant Allergist, KEM Hospital, Mumbai, Maharashtra

The COVID-19 pandemic caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2), has various clinical presentations from asymptomatic cases to severe pulmonary disease, multi organ failure and death. Initially, it was postulated that patients with allergy and asthma might be susceptibility for severe symptoms of SARS-CoV-2, as respiratory viral infections usually leads to asthma exacerbations. The Allergic Rhinitis and its Impact on Asthma (ARIA) society, European Academy of Allergology and Clinical Immunology (EAACI) and European Forum for Research and Education in Allergy and Airway Diseases (EUFOREA) stated that patients with airway allergies do not worsen or are at high risk of severe SARS-CoV-2 disease.1

Chhapola Shukla in a recent literature review did not show airway allergic diseases like allergic rhinitis and asthma, to be a high risk factor or that it increases the severity of COVID-19, contrary to the belief at the beginning of the pandemic.1 This is due to a decrease in Angiotensin-converting enzyme 2 (ACE2) gene expression in the nose and bronchial cells of allergic airway diseases. A high ACE2 expression in bronchial cells of patients with old age, obesity, asthma, COPD, hypertension, male gender, and smokers, contributes to severe COVID-19 symptoms and increased morbidity. Jackson et al reported respiratory allergies, allergen exposures, high IgE and allergen sensitization to be associated with a decrease in ACE2 expression in the nasal and bronchial epithelium of asthma patients.2 Hence, they concluded reduced ACE2 expression to be one of the strong factors in patients with respiratory allergies for reduced COVID-19 severity. Also, low ACE2 expression was not associated with non-atopic asthma. The Severe Asthma Research Program-3 (SARP), showed sputum cells of males, diabetics, and African Americans, had a high expression of ACE2 and TMPRSS2 (Transmembrane protease serine 2), thus explaining their poor prognosis with COVID.3 Their early evidence demonstrated that inhaled corticosteroid (ICS) use leads to decrease in sputum ACE2 and TMPRSS2 expression. Type 2 immune response occurs in atopic diseases like allergies, asthma, atopic dermatitis, and parasitic helminth infections. Type 2 immune response leads to cytokines interleukins production eg IL-4, IL-5, IL-9, and IL-13 and eosinophils accumulation which may be protective against COVID-19. Recent literature shows severe SARS-CoV-2 infection has a systemic Th1 response, activation of inflammatory pathway and cytokine storm leading to increased mortality due to acute respiratory distress syndrome and multi organ failure.

The theme of World Allergy Week 2020 was “Allergy care does not stop with COVID-19”. Various Allergy societies have presented guidelines for management of allergic rhinitis and asthma during this pandemic and are continuously updated to keep abreast of the current situation and act accordingly. Medical education and awareness is the key step for protection of patients and health care workers. ARIA-EAACI joint statement stresses the importance of continuing intranasal corticosteroid (INS) for allergic rhinitis in this pandemic. It is not advisable to stop INS as it may cause excessive sneezing and hence spread of the virus. Global Initiative for Asthma (GINA) guidelines recommends all asthmatics to be treated with inhaled corticosteroids (ICS) with or without long acting beta-2 agonists (LABA) as controllers. Patients with allergic diseases should maintain their inhaled corticosteroids, biologics, and allergen immunotherapy. GINA released a statement in this pandemic not to stop inhaled corticosteroid (ICS) controller medication, as it can lead to asthma exacerbations. Also, topical steroids (nasal or inhaled) do not suppress the immune system. Preliminary evidence suggests ICS use to be beneficial for viral infections, especially due to coronavirus. Yamaya et al demonstrated that pretreatment of in-vitro human respiratory (nasal and tracheal) epithelial cells with glycopyrronium, formoterol, and their combination with budesonide reduces replication of HCoV-229E and secretion of cytokines IL-6 and IL-8.4 IL-6 and IL-8 relates to airway inflammation and asthma exacerbation due to viral infection. These drugs might modulate airway inflammation pathway post HCoV-229E infection. Early data suggests in vitro blockage of SARS-CoV-2 RNA replication and cytopathic activity inhibition by Ciclesonide.1 This may be of utmost significance to reduce the risk and severity of the disease.

Allergen immunotherapy (AIT) is the only disease modulating treatment providing long term benefits for IgE mediated allergic diseases like allergic rhinitis and allergic asthma. AIT halts progress of existing allergies, prevents neosensitisation and reduces asthma risk in patients with allergic rhinitis and vice versa. AIT induces allergen specific immune tolerance by action on allergen-specific T cells, B cells, and effector cells like mast cells, eosinophils and basophils. AIT decreases allergen specific IgE and increases specific IgG1 and IgG4. It does not affect the immune system or cause any immune deficiency. Hence, stopping immunotherapy in this pandemic is not advised. AIT can be taken as injections (subcutaneous immunotherapy; SCIT) or as drops or tablets under the tongue (sublingual immunotherapy; SLIT). SLIT has high safety profile and can be taken at home, thus avoiding travel to an allergy specialist and further contact to other people. ARIA-EAACI statement suggests AIT to be continued in patients without infection.5 If COVID-19 is confirmed, they should discontinue AIT, till resolution of symptoms and/or quarantine is completed or with detection of SARS-CoV-2 serum IgG without virus IgM.

Conclusion: Individuals with allergic airway diseases with high allergic sensitisation on maintenance treatment with INS, ICS, biologics and AIT seem to have a low risk of developing COVID-19. Allergy patients should be educated to follow the treatment plan, refrain from stopping the medication or making self dose adjustments as it may precipitate asthma exacerbations and might require hospitalization.
Telemedicine and digital platforms are preferred for follow up consultations so as to minimize the risk of viral spread and at the same time deliver personalized care.

References


