Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Ann Allergy Asthma Immunol 125 (2020) 365–366

Contents lists available at ScienceDirect

Editorial

Psychological stress, immune dysfunction, and allergy

Opportunities for improved patient health

No one needs to wonder whether we have all become more stressed, more anxious, and even more depressed in the past 6 months amid the worst pandemic in over 100 years. Fear of infection with the possibility of illness and even death is accompanied by frustrations and anxieties over the adverse impact that this virus has had on our lives—personal and professional. Most of us are creatures of habit—we like what we like, the way we like it, and when we like it. In the beginning of the pandemic, we were all scared enough that when the shutdown occurred, most of us were more worried about ourselves, our families, and friends than we were about our businesses. Masks, social distancing, and extreme hygienic measures all seemed reasonable, at least initially. As the country reopened this summer, many of these precautions were relaxed. Now, we are in the midst of an upturn in the cases of coronavirus disease 2019 throughout our country and around the world. Dramatic changes in lifestyles and life events present daily challenges to all of us. These types of stressors have been found to alter immunity[1] and affect various inflammatory diseases, such as allergy and asthma.[2]

It is somewhat serendipitous that the emphasis for this month on stress and allergy would come now because it was planned well over a year ago. As we and our families are experiencing higher levels of chronic stress perceptions, anxiety, and depression, so are most of our patients. It is fundamentally important for us to understand the targets of chronic stress from the neuroendocrine and autonomic nervous influences on immune organs, networks, and cells. There are impacts from external events and internal challenges (psychological and physical). A better and deeper understanding of the mind-body relationships is critical if we, as allergists-immunologists, are to address the whole patient to whom we are committed to render optimal care.

This month's issue features several articles in different formats that should allow readers to improve and increase their fund of knowledge and develop appreciation to the extent that stress can adversely affect our patients and how we can begin to identify and even intervene against these disease-exacerbating influences.

In a basic approach, Theoharides[3] begins at the cellular level by describing the adverse impact of psychological stress on mast cell function through neuroendocrine pathways that involve corticotropin-releasing hormone, neurotensin, and substance P. This increased mast cell sensitivity and the activity is further enhanced by the allergic inflammatory milieu—producing cytokines, such as interleukin 33. Such diverse illnesses, as asthma, atopic dermatitis, and mastocytosis, seem to be particularly susceptible to stress-mediated mast cell activation. Oren and Martinez[4] move to the whole-body physiological consequences of chronic excessive stress that can translate into increases in both incidence of new asthma and exacerbation of the existing disease. They succinctly review the progression from neuroendocrine pathways to altered inflammatory responses to clinical comorbidities indicating long-term effects of stress—for example, children with significant life stressors can manifest increased incidence and severity of asthma as adolescents and adults extending even to such practical applications as decreased responsiveness to long- and short-acting bronchodilators during a time of high stress.

Excessive psychological stress can affect people of all ages. Landro-Guiterrez and Celedon[5] discuss the special circumstances of chronic stress in adolescents with allergy and asthma. Even with the limited body of literature for this age population, they reveal the adverse relationships between excessive stress and asthma (both incidence and activity) in teens. They likewise call on clinicians to make a routine assessment of stressors part of our care of these patients. Lara-Marquez and Kelly extend the discussion on stress and disease in allergic skin diseases by revealing that the association in worsening pathophysiology is actually a 2-way stress—that is, the inflammatory cascades that come from atopic dermatitis can affect how a host responds to stressors and the resulting stress response can adversely alter the inflammatory milieu. This enigma is likely common in most (if not all) clinical inflammatory disease populations.

Finally, Tull and Clemens[6] describe the tools that can be used in the offices of allergist-immunologists to objectively quantitate the levels of perceived stress, anxiety, and depression. This assessment can facilitate needed referrals for psychological and/or psychiatric treatment. Additional mention is made of pragmatic interventions that can readily be done in our offices with minimal training, which allow patient engagement for effective stress management. Silvers and O'Connor[7] bring the discussion full circle by reminding us that a "compleat" physician is one who addresses the whole patient, not just the nose, lung, or skin.

The issue of the *Annals of Allergy, Asthma and Immunology* for this month should provide readers with usable information to ponder on relationships among excessive chronic stress (extremely prevalent in our current society), anxiety, and/or depression, which can adversely affect disease control in our patients. We must educate ourselves and our patients and their families about the potentially harmful consequences of the current levels of stress with which we live and develop meaningful methods to mitigate its adverse effects.

Disclosures: The author has no conflicts of interest to report.
Funding: The author has no funding sources to report.

https://doi.org/10.1016/j.anai.2020.08.020

Gailen D. Marshall, Jr, MD, PhD
Division of Asthma, Allergy, and Clinical Immunology
Department of Medicine
The University of Mississippi Medical Center
Jackson, Mississippi
gmarshall@umc.edu

References

1. Marshall Jr GD. The adverse effects of psychological stress on immunoregulatory balance: applications to human inflammatory diseases. *Immunol Allergy Clin North Am*. 2011;31(1):133–140.
2. Marshall GD, Tull MT. Stress, mindfulness, and the allergic patient. *Expert Rev Clin Immunol*. 2018;14(12):1065–1079.
3. Theoharides TC. The impact of psychological stress on mast cells. *Ann Allergy Asthma Immunol*. 2020;125(4):388–392.
4. Oren E, Martinez FD. Stress and asthma: physiologic manifestations and clinical implications. *Ann Allergy Asthma Immunol*. 2020;125(4):372–373.e1.
5. Landro-Gutierrez J, Celedon JC. Chronic stress and asthma in adolescents. *Ann Allergy Asthma Immunol*. 2020;125(4):393–398.
6. Tull MT, Clemens KS. Identifying and addressing stress, anxiety, and depression in the allergist's office. *Ann Allergy Asthma Immunol*. 2020;125(4):374–375.
7. Silvers WS, O'Connor M. Is the compleat allergist an integrative physician. *Ann Allergy Asthma Immunol*. 2020;125(4):378–379.