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EDITORIAL

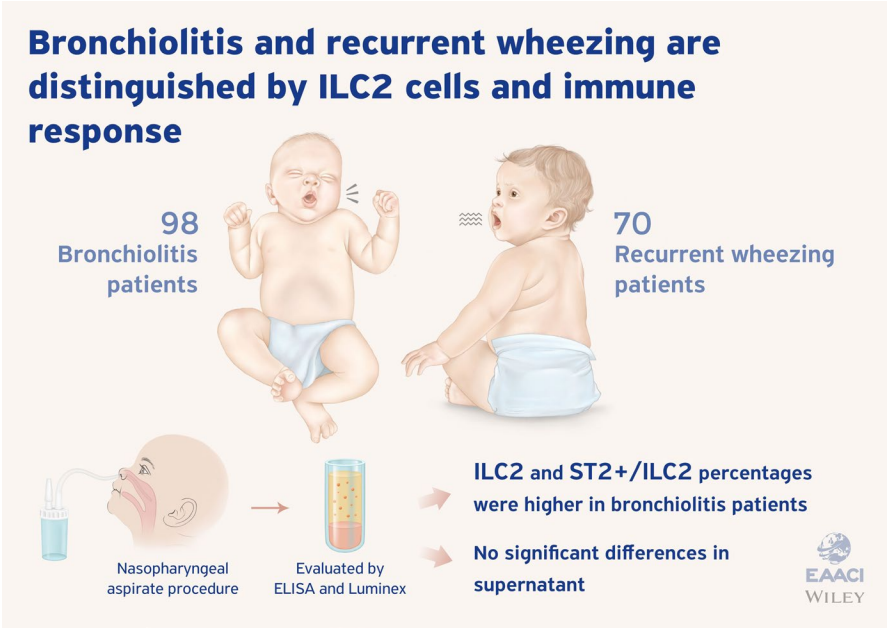
WILEY

Immunology and genetics of asthma, and probiotics in the treatment of atopic dermatitis

This past year has been disrupting, but also seen positive challenges in many aspects. And we would like to start this first issue of 2021 with a positive message. COVID-19 vaccines are coming, and hopefully, they will largely contribute to controlling the spread of the pandemic. Common vaccines trigger an immune response by an antigen-driven stimulus. However, the SARS-CoV-2-induced pandemic control is addressed not only by classic vaccine strategies but also by new, RNA-based strategies. The first review of this issue by Eberhardt and Siegrist assesses the various immunization strategies and their limitations to the pediatric population.[1] In addition, with the second wave (or third wave for some regions) pediatricians will be faced with more patients suffering from the multisystem inflammatory syndrome in children (MIS-C). The second review also addresses COVID-19 in pediatrics and discusses potential explanations for progression from "classic" COVID-19 to MIS-C.[2]

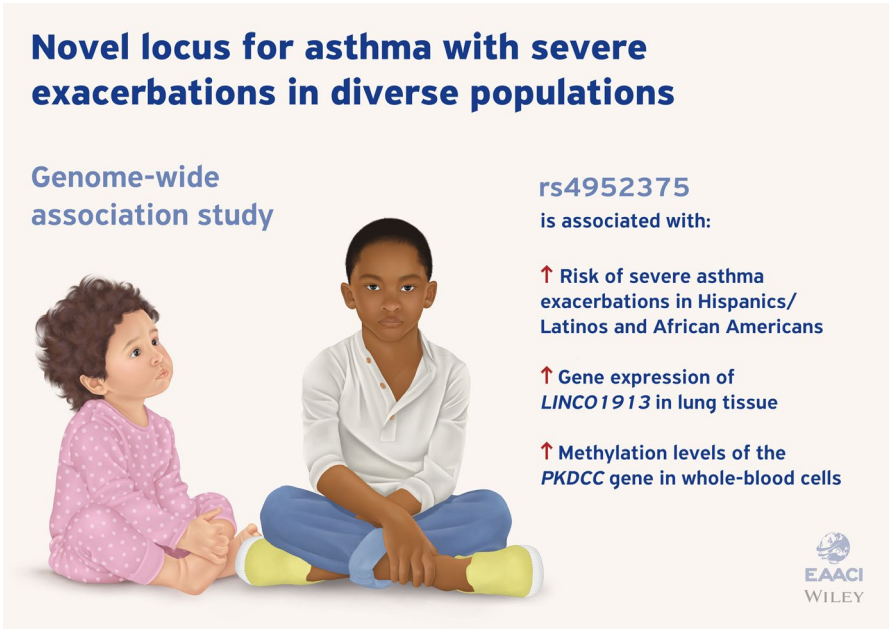
Beatriz Sastre

Asthma is a common disease in childhood, with still unmet needs regarding the understanding of immune mechanisms of progressions, as well as optimization of treatment by immunomodulators.[3,4] The first study I wish to comment on in this editorial is published by Beatriz Sastre and colleagues who investigated immune mechanisms underlying the development of recurrent wheezing after bronchiolitis in infancy.[5] Cells obtained from nasopharyngeal aspirates were sorted by flow cytometry to isolate type 2 innate lymphoid cells (ILC2). Cell mRNA expression was analyzed for a variety of inflammatory factors, and a large panel of pro-inflammatory and immunomodulatory factors, as well as lipid mediators and nitrites, was evaluated by ELISA and Luminex. They observed a higher expression of the $ST2^{+}$ IL-33 receptor in the ILC2 population from the bronchiolitis group. This expression receptor could be increased by the presence of IL-1β, IL-2, or lipid mediators such as cysteinyl leukotrienes (LTC4 or LTE4) or prostaglandin D2. They conclude by mentioning that bronchiolitis patients had a higher percentage of ILC2 cells in the nasal aspirate and that this population of cells, by providing specific inflammatory signals, could play a significant role in the development of wheezing episodes later in life. Other studies and a review have recently addressed cell-related mechanisms of asthma and confirm the recent interest in innate-immunity-related mechanisms of asthma.[6-8]



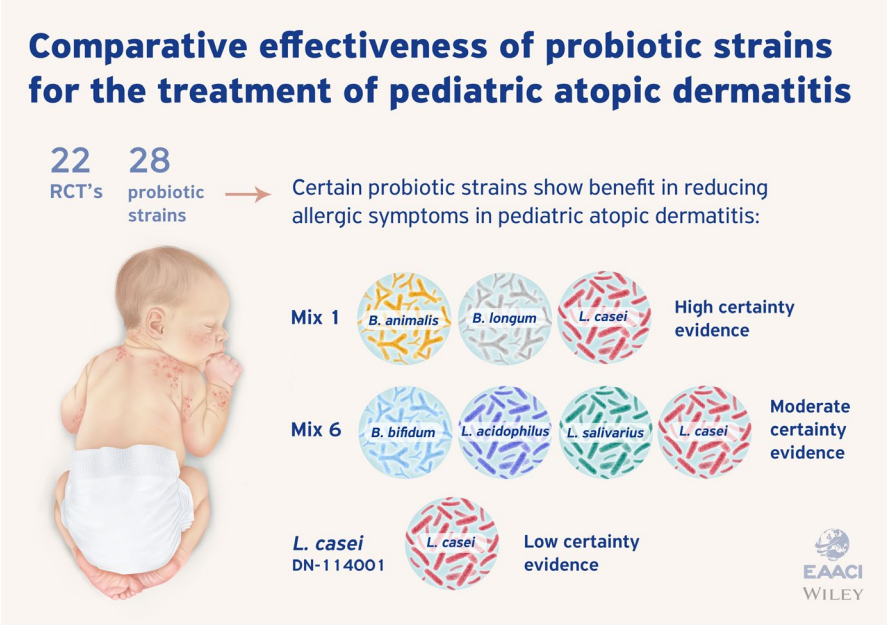
Esther Herrera-Luis

It is well known that genetics is a strong determinant for the risk of developing asthma exacerbations, particularly in persons with African ancestry. The second highlighted article by Esther Herrera-Luis et al investigated this risk by genome-wide association studies in various populations, including African Americans and Hispanics/Latino children with severe asthma exacerbations, as well as controls.[9] The initial screening included over 3000 individuals of various ethnic origins. The study identified a novel genome-wide significant association for severe asthma exacerbations on chromosome 2p21. The associated variant is a lung expression quantitative trait loci for the long intergenic non-protein coding RNA 1913 gene and is also a whole-blood methylation quantitative trait locus of a CpG site annotated to the protein kinase domain-containing cytoplasmic gene. While these two genes are probably not known yet by the clinicians treating asthma patients, they may be targeted in the future for clinical interventions for the prevention or treatment of asthma exacerbations. Genetic studies focusing on specific populations are scarce in pediatric asthma; nevertheless, PAI has recently published studies addressing a South African Xhosa population and a Chinese population.[10,11] Similarly to the study commented above, Popovic et al have investigated the methylation of DNA regions in asthmatic patients.[12] In addition, other studies contribute to the link between genetics and inflammation.[13,14]



Carol Tan-Lim

Probiotics have raised in the last decades a large interest either for the prevention or for treatment of various allergic diseases, as well as a solution to stop the progression of atopic diseases. Meta-analyses for the role of probiotics on the outcome of atopy or the prevention of food allergy have recently been published in PAI.[15,16] The third highlighted article by Carol Tan-Lim and coworkers provides the results of a meta-analysis exploring the effectiveness of probiotic strains for the treatment of atopic dermatitis in pediatric patients.[17] The systematic analysis of articles selected 22 studies with 28 different probiotic strains. The most effective strains or mix of strains were Mix1 (*Bifidobacterium animalis*, *Bifidobacterium longum*, and a *Lactobacillus casei* CECT 9104); *Lactobacillus casei* DN-114001; and Mix6 (*Bifidobacterium bifidum*, *Lactobacillus acidophilus*, *Lactobacillus casei*, and *Lactobacillus salivarius*). These reduced atopic dermatitis symptoms in a range going from high (for Mix 1) to a low certainty of evidence (for *Lactobacillus casei* DN-114001). The treatment of atopic dermatitis by probiotics has been addressed earlier in PAI,[18] and interestingly another approach with Turkish traditional fermented foods has been validated.[19] Bacteria may also influence allergies through microbial-derived products [20] and indirectly by breastmilk consumption.[21] Although various mechanisms of actions have been studied,[22] much remains to be explored in relation to probiotics and the microbiota.



I hope you will enjoy reading this selection of articles, and the other contributions included in this issue of PAI.

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