thereby translating TH1/TH2 antagonism directly into epithelial gene regulation. IL-4 and IFN-γ induced distinct transcription factor hubs or clusters that exist in antagonistic and polarized gene regulatory networks [14]. Moreover, the IL-4-dependent induction of IL-24 observed in rhinitis patients was downregulated by IFN-γ. erefore, IL-24 may be a unique biomarker for allergic in ammation and TH2-polarized epithelia.

Clearly, preventing asthma or altering the risk of developing asthma in utero would have enormous bene ts for society and for those who su er from asthma throughout their lives [14]. Vitamin D has long been associated with asthma pathogenesis and immunity and two important studies were conducted to determine whether vitamin D3 supplementation a ects the development of asthma in childhood. e rst study, conducted in Europe, recruited 623 females aged 24 weeks and followed 581 infants aged 3 to her 28 years. Women were randomized to receive either 400 IU or 2400 IU of vitamin D as a regular supplement. e primary aim was that the supplement reduced persistent wheezing by age 3 years [15]. In the intervention group, 20% of the control group had wheezing lasting 16 minutes, but this was not a signi cant di erence. No, but other secondary outcomes such as troublesome episodes of lung problems decreased. A second study, reported in the same journal, was a larger, three-center US study that followed 806 children to age 3 years but recruited women whose children were at high risk for asthma. .) vitamin D and control groups received 400 IU [16]. By selecting the high-risk group, more children (218/806) developed persistent wheezing, with an absolute reduction in persistent wheezing of 6%. , but none were signi cant. Interestingly, most e ects may have occurred in the rst year or two and then faded. In both studies, people who took additional supplements were more likely to get enough vitamin D. e results observed in both studies were similar, and although the studies may have been too weak to detect such complex ndings, the results suggest that vitamin D supplementation alters asthma risk. e case has not been proven.

It has long been known that the risk of developing asthma during childhood is complex, and that this risk varies by gender [17]. e importance of gender was further emphasized31. It was found that 12.7% experienced initial transient wheezing and 13.1% experienced persistent wheezing. Compared with no/rare wheezing, maternal asthma, infant bronchiolitis, and atopic dermatitis were associated with persistent wheezing in both boys and girls, whereas paternal asthma was associated only with boys. Being black or Hispanic was a predictor only for girls, which was associated with persistent wheezing (odds ratio [OR] 4.27; 95% con dence interval [KI] 2.33-7.83). e strong association between paternal asthma and boys' risk is indeed underscored, con rming the role of other environmental and social factors previously mentioned [18]. ese studies indicate that paternal genetic factors appear to play an important role in the development of persistent asthma in boys and highlight which factors need further investigation.

Sublingual Dust Mite Immunotherapy and Asthma

e close relationship between childhood asthma and dust mite allergy has led to a number of interventions to reduce the e ects of asthma exposure [19]. e advent of sublingual immunotherapy has reversed academic interest in desensitization, it opened up as a treatment to a wider population with less disruption and potentially lower risk compared to subcutaneous desensitization protocols was administered to 834 her HDM sensitizers with asthma inadequately controlled with ICS alone [20]. Subjects were randomized to receive either placebo or her two doses of sublingual HDM. e primary endpoint was reduction in time to rst moderate-to-severe exacerbation. Both doses reduced the risk of asthma exacerbation (hazard ratio 0.72; 95% CI 0.52-0.99), but did not change asthma control scores or quality of life [21]. Although the e ects observed were modest, they indicate that chronic allergen exposure plays a direct role in exacerbation risk and, when reduced, modi es asthma.

Conclusion

Important studies are currently underway that reveals important links between the innate immune response in asthma and the traditional acquired type II immune response. We expect this to be one of the next areas where the development of targeted therapies will lead to important new therapies. Because this domain is important for the pathogenesis of pediatric asthma and the interaction between viral infection and allergic sensitization, the development of therapeutics speci cally targeting acute asthma and potentially a ecting disease progression in childhood is expected.

Clinical trials of biologics may progress, but at this stage they are still most e ective in patients with severe disease, allergic disease or a dysregulated type II immune response. Its use in early disease in the form may alter the course of asthma.

References

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