Selections from international journals

Nahla M. Heshmat
Professor of Pediatrics, Ain Shams University

World Allergy Organ J. 2015;27;8(1):4.
World Allergy Organization-McMaster University Guidelines for Allergic Disease Prevention (GLAD-P): Probiotics.

Fiocchi A, Pawankar R, Cuello-Garcia C, Ahn K, Al-Hammadi S, Agarwal A, Beyer K, Burks W, Canonica GW, Ebisawa M, Gandhi S, Kamenwa R, Lee BW, Li H, Prescott S, Riva JJ, Rosenwasser L, Sampson H, Spigler M, Terracciano L, Vereda-Ortiz A, Waserman S, Yepes-Nuñez JJ, Bro| ek JL, Schünemann HJ.

BACKGROUND: Prevalence of allergic diseases in infants, whose parents and siblings do not have allergy, is approximately 10% and reaches 20-30% in those with an allergic first-degree relative. Intestinal microbiota may modulate immunologic and inflammatory systemic responses and, thus, influence development of sensitization and allergy. Probiotics have been reported to modulate immune responses and their supplementation has been proposed as a preventive intervention. OBJECTIVE: The World Allergy Organization (WAO) convened a guideline panel to develop evidence-based recommendations about the use of probiotics in the prevention of allergy. METHODS: We identified the most relevant clinical questions and performed a systematic review of randomized controlled trials of probiotics for the prevention of allergy. We followed the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to develop recommendations. We searched for and reviewed the evidence about health effects, patient values and preferences, and resource use (up to November 2014). We followed the GRADE evidence-to-decision framework to develop recommendations. RESULTS: Currently available evidence does not indicate that probiotic supplementation reduces the risk of developing allergy in children. However, considering all critical outcomes in this context, the WAO guideline panel determined that there is a likely net benefit from using probiotics resulting primarily from prevention of eczema. The WAO guideline panel suggests: a) using probiotics in pregnant women at high risk for having an allergic child; b) using probiotics in women who breastfeed infants at high risk of developing allergy; and c) using probiotics in infants at high risk of developing allergy. All recommendations are conditional and supported by very low quality evidence. CONCLUSIONS: WAO recommendations about probiotic supplementation for prevention of allergy are intended to support parents, clinicians and other health care professionals in their decisions whether to use probiotics in pregnancy and during breastfeeding, and whether to give them to infants.

Physiol Meas. 2015;36(2):273-82.
Thermal imaging in screening of joint inflammation and rheumatoid arthritis in children.

Lasanen R, Piippo-Savolainen E, Remes-Pakarinen T, Kröger L, Heikkilä A, Julkunen P, Karhu J, Töyräs J.

Potential of modern thermal imaging for screening and differentiation of joint inflammation has not been assessed in child and juvenile patient populations, typically demanding groups in diagnostics of musculoskeletal disorders. We hypothesize that thermal imaging can detect joint inflammation in patients with juvenile idiopathic arthritis or autoimmune disease with arthritis such as systemic lupus erythematosus. To evaluate the hypothesis, we studied 58 children exhibiting symptoms of joint inflammation. First, the patients' joints were examined along clinical procedure supplemented with ultrasound imaging when deemed necessary by the clinician. Second, thermal images were acquired from patients' knees and ankles. Results of thermal imaging were compared to clinical evaluations in knee and ankle. The temperatures were significantly ($p_{max}=0.044$, $p_{mean}<0.001$) higher in inflamed ankle joints, but not in inflamed knee joints. No significant difference was found between the skin surface temperatures of medial and lateral aspects of ankle joints. In knee joints the mean temperatures of medial and lateral aspect differed significantly ($p=0.004$). We have demonstrated that thermal imaging may have potential for detecting joint inflammation in ankle joints of children. For knee joints our results are inconclusive and further research is warranted.

Ann Allergy Asthma Immunol. 2015;114(2):103-10.
Sinus and adenoid inflammation in children with chronic rhinosinusitis and asthma.

Anfuso A, Ramadan H, Terrell A, Demirdag Y, Walton C, Skoner DP, Piedimonte G.

BACKGROUND: Chronic rhinosinusitis (CRS) and asthma frequently coexist in children and adults. However, the precise pathophysiologic mechanism of this interaction is still poorly understood, especially in children, owing to the lack of direct measurements of mucosal inflammation in the upper airways. OBJECTIVE: To determine the pathophysiologic mechanism by analyzing the expression of a large array of inflammatory cytokines and chemokines in the sinus and adenoid tissues surgically removed from pediatric patients with CRS refractory to medical management. METHODS: Twenty-eight children 2 to 12 years old diagnosed with CRS with or without asthma and 10 controls were included in this prospective, nonrandomized study. Mucosal expression of 40 inflammatory cytokines was measured with a multiplex assay and was normalized to total tissue protein. RESULTS: Compared with children with CRS and without asthma, children with CRS and asthma had significantly higher sinus levels of tumor necrosis factor-± and adenoid levels of epidermal growth factor, eotaxin, fibroblast growth factor-2, growth-related oncogene, and platelet-derived growth factor-AA. CONCLUSION: The inflammatory response in the upper airway mucosa of children with asthma and CRS was similar, but more severe, compared with children with CRS without asthma. This observation is consistent with the hypothesis that asthma in these patients is caused or exacerbated by severe upper airway disease and supports the concept that treating sinus disease is paramount in the management of chronic asthma in children using, for the first time, direct measurements of airway inflammation in children.

J Allergy Clin Immunol. 2015;135(1):153-63.
Identification of novel immune and barrier genes in atopic dermatitis by means of laser capture microdissection.

Esaki H, Ewald DA, Ungar B, Rozenblit M, Zheng X, Xu H, Estrada YD, Peng X, Mitsui H, Litman T, Suárez-Fariñas M, Krueger JG, Guttman-Yassky E.

BACKGROUND: The molecular signature of atopic dermatitis (AD) lesions is associated with TH2 and TH22 activation and epidermal alterations. However, the epidermal and dermal AD transcriptomes and their respective contributions to abnormalities in respective immune and barrier phenotypes are unknown. OBJECTIVE: We sought to establish the genomic profile of the epidermal and dermal compartments of lesional and nonlesional AD skin compared with normal skin. METHODS: Laser capture microdissection was performed to separate the epidermis and dermis of lesional and nonlesional skin from patients with AD and normal skin from healthy volunteers, followed by gene expression (microarrays and real-time PCR) and immunostaining studies. RESULTS: Our study identified novel immune and barrier genes, including the IL-34 cytokine and claudins 4 and 8, and showed increased detection of key AD genes usually undetectable on arrays (i.e., IL22, thymic stromal lymphopoietin [TSLP], CCL22, and CCL26). Overall, the combined epidermal and dermal transcriptomes enlarged the AD transcriptome, adding 674 upregulated and 405 downregulated differentially expressed genes between lesional and nonlesional skin to the AD transcriptome. We were also able to localize individual transcripts as primarily epidermal (defensin, beta 4A [DEFB4A]) or dermal (IL22, cytotoxic T-lymphocyte antigen 4 [CTLA4], and CCR7) and link their expressions to possible cellular sources. CONCLUSIONS: This is the first report that establishes robust epidermal and dermal genomic signatures of lesional and nonlesional AD skin and normal skin compared with whole tissues. These data establish the utility of laser capture microdissection to separate different compartments and cellular subsets in patients with AD, allowing localization of key barrier or immune molecules and enabling detection of gene products usually not detected on arrays.