Year-in-Review

Year in Review - atopic dermatitis

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Compared with other allergic disorders, atopic dermatitis showed rather slow progress in basic research and clinical applications. Recently, however, remarkable progress has been achieved from high-quality basic research to large-scale clinical study on the new therapeutics.

In this presentation, I will review the recent progress of research on atopic dermatitis with respect to articles published Journal of Allergy and Clinical Immunology since 2017, encompassing several areas of interest: biomarker/endophenotype, epidemiology, mechanism, microbiome, and treatment. Reviewing not only up-to-date knowledge, but also directionality of future atopic dermatitis research, I wish I could share and discuss the implication of recent progress of researches on atopic dermatitis.

Keywords: biomarker, endophenotype, epidemiology, mechanism, microbiome, treatment

1. Biomarker/endophenotype: Elusive as clouds

Everyone in the atopic dermatitis (AD) clinic knows that AD is heterogenous in nature. In addition, remarkable progress of endophenotyping in adjacent “asthma” stimulates the imagination of clinicians involved in AD. Reality, however, is as elusive as clouds. Reports on the endophenotyping of AD into various sub-groups are frequently reported in the Journal[1,2], but practical implication of sub-grouping is unclear.

The building blocks for sub-grouping are biomarkers. Although, many putative biomarkers have been reported in the Journal[3], but few survives weathering of time and trend, and just fade away.

2. Epidemiology: A fountain that never goes dry

Although not as outstanding and interesting as other heroes in AD, such as pathophysiology and

innovative treatments, the importance of epidemiology cannot be overemphasized. Insights from the epidemiologic study were always cornerstone for imaginative breakthrough for both basic research and clinical study - as a fountain that never goes dry. Thus editors of the Journal are always cautious enough to deliver interesting epidemiologic findings to readers[4-6]. Early consumption of peanut is recently recommended for the prevention of peanut allergy. However, it does not prevent other allergic diseases later, thus demonstrating allergen specificity of early peanut consumption[6].

3. Mechanism: Peace after great breakthrough

We were flooded by great breakthroughs in the mechanistic study of AD pathogenesis in recent years, principally led by Guttman-Yassky group[7,8], such as Th17, Th22 etc. Nowadays great breakthrough is rarely seen in the Journal, however, new mechanistic studies are continuously adding new insight in the pathophysiologic understanding of AD. In the Journal, new mechanism related with IL-31 action was revealed[9] and the role of basophil in the allergic responses was re-evaluated[10]. I hope this peaceful period will be followed by another major breakthrough.

4. Microbiome: A bridge too far for practice

Microbiome became main stream of AD research, and this is reflected in the publications in the Journal. One concern about the microbiome-related research of AD is what practical implication microbiome has on the management of AD. For example, in the Journal, Korean researchers revealed that gut microbiomes are influenced by feeding type of AD patient[11]. However, real question is what we can do based on the findings related to this study. Personally I do not think it is very hard for us to obtain a fundamental or practical knowledge to change our clinical practice from the microbiome research.

5. Treatment: End of waiting for Godot?

Since the introduction of topical calcineurin inhibitors in the early 2000s, clinicians waited “real” drug to prescribe, really replacing need for steroid. New drugs, such as biologics, small molecules, satisfy this unmet need. Dupilumab, the leading new weapon introduced several years ago, cast new hope on the management of AD. In the Journal, meta-analysis of the large scale clinical study of dupilumab was reported[12]. Dupilumab showed remarkable efficacy without meaningful adverse drug reactions. Results of clinical study involving other new agents are currently undergoing[13]. Interestingly, promising new-concept treatment based on the skin-penetrating peptide vehicle from Korean researchers was reported recently, waiting for the clinical proof of efficacy[14].

However, never forget “oldies goodies” in our arsenal. According to the article published recently in the Journal, old drugs, such as, methotrexate and azathioprine could be an indispensable weapon for the clinicians waiting for alternative drug to steroids[15].

References

1. Bieber T et al. Clinical phenotypes and endophenotypes of atopic dermatitis: Where are we, and where should we go? J Allergy Clin Immunol 2017; 139: S58-64.
2. Paternoster L et al. Identification of atopic dermatitis subgroups in children from 2 longitudinal birth cohorts. J Allergy Clin Immunol 2018; 141(3): 964-971.
3. Nagao M et al. SCCA2 is a reliable biomarker for evaluating pediatric atopic dermatitis. J Allergy Clin Immunol 2018; Epub ahead of print.
4. Tran MM et al. Predicting the atopic march: Results from the Canadian Healthy Infant Longitudinal Development Study. J Allergy Clin Immunol 2018; 141: 601-607.e8.
5. Abuabara K et al. Patterns and predictors of atopic dermatitis disease control past childhood: An observational cohort study. J Allergy Clin Immunol 2018; 141: 778-780.e6.
6. du Toit G et al. Allergen specificity of early peanut consumption and effect on development of allergic disease in the Learning Early About Peanut Allergy study cohort. J Allergy Clin Immunol 2018; 141: 1343-1353.
7. Khattri S et al. Cyclosporine in patients with atopic dermatitis modulate activated inflammatory pathways and reverse epidermal pathology. J Allergy Clin Immunol 2014; 133: 1626-34.
8. Suarez-Farinas M et al. RNA sequencing atopic dermatitis transcriptome profiling provides insights into novel disease mechanisms with potential therapeutic implications. J Allergy Clin Immunol 2015;135:1218-1227.
9. Meng J et al. New mechanism underlying IL-31-induced atopic dermatitis. J Allergy Clin Immunol 2018 Epub ahead of print.
10. Cassard L et al. Basophils from allergic patients are neither hyperresponsive to activation signals nor hyporesponsive to inhibition signals. J Allergy Clin Immunol 2018. Epub ahead of print.
11. Lee MJ et al. Perturbations of gut microbiome genes in infants with atopic dermatitis according to feeding type. J Allergy Clin Immunol. 2018; 141: 1310-1319.
12. Han Y et al. Efficacy and safety of dupilumab for the treatment of adult atopic dermatitis: A meta-analysis of randomized clinical trials. J Allergy Clin Immunol. 2017; 140: 888-891.e6.
13. Paller AS et al. Therapeutic pipeline for atopic dermatitis: End of the drought? J Allergy Clin Immunol 2017 Sep;140(3):633-643.
14. Kim WJ et al. Protein tyrosine phosphatase conjugated with a novel transdermal delivery peptide, astrotactin 1-derived peptide recombinant protein tyrosine phosphatase (AP-rPTP), alleviates both atopic dermatitis-like and psoriasis-like dermatitis. J Allergy Clin Immunol 2018; 141: 137-151.
15. Roekevisch E et al. Methotrexate versus azathioprine in patients with atopic dermatitis: 2-year follow-up data. J Allergy Clin Immunol 2018; 141: 825-827.e10.