
Treatment Effect of the Tree SLIT-Tablet on Allergic Rhinoconjunctivitis During Oak Pollen Season

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Introduction

- The birch homologous group contains several tree-species, including oak, alder, and hazel, based on IgE cross-reactivity to the birch allergens *Betula verrucosa* 1 and 2 (Bet v 1 and Bet v 2)¹
- Theoretically, allergy to these tree pollens may be treated by immunotherapy with one representative allergen extract²
- In patients with allergic rhinitis in the US, the prevalence of specific IgE to birch and oak is 23% and 26%, respectively³
- Tree sublingual immunotherapy (SLIT)-tablet containing birch pollen extract has been found to improve allergic rhinoconjunctivitis (ARC) symptoms and reduce symptom-relieving medication use during birch pollen season in subjects with birch pollen-induced allergic rhinitis with or without conjunctivitis (AR/C)⁴
- Previous work has shown that treatment with the tree SLIT-tablet significantly reduced ARC symptoms after challenge with oak in an allergen exposure chamber and induced oak-specific immunologic responses⁵
- In this post-hoc analysis, treatment effects of the tree SLIT-tablet were evaluated during a birch-free oak pollen season in participants with birch and related pollen-induced AR/C

1. Lorenz AR, et al. *Int Arch Allergy Immunol*. 2009;148(1):1-17.
2. Cox L, et al. *J Allergy Clin Immunol*. 2011;127(1 Suppl):S1-55.
3. Salo PM, et al. *J Allergy Clinical Immunol*. 2011;127(5):1226-1235.
4. Biedermann T, et al. *J Allergy Clinical Immunol*. 2019;143(3):1058-1066.
5. Couroux P, et al. *Allergy*. 2019;74(2): 361-369.

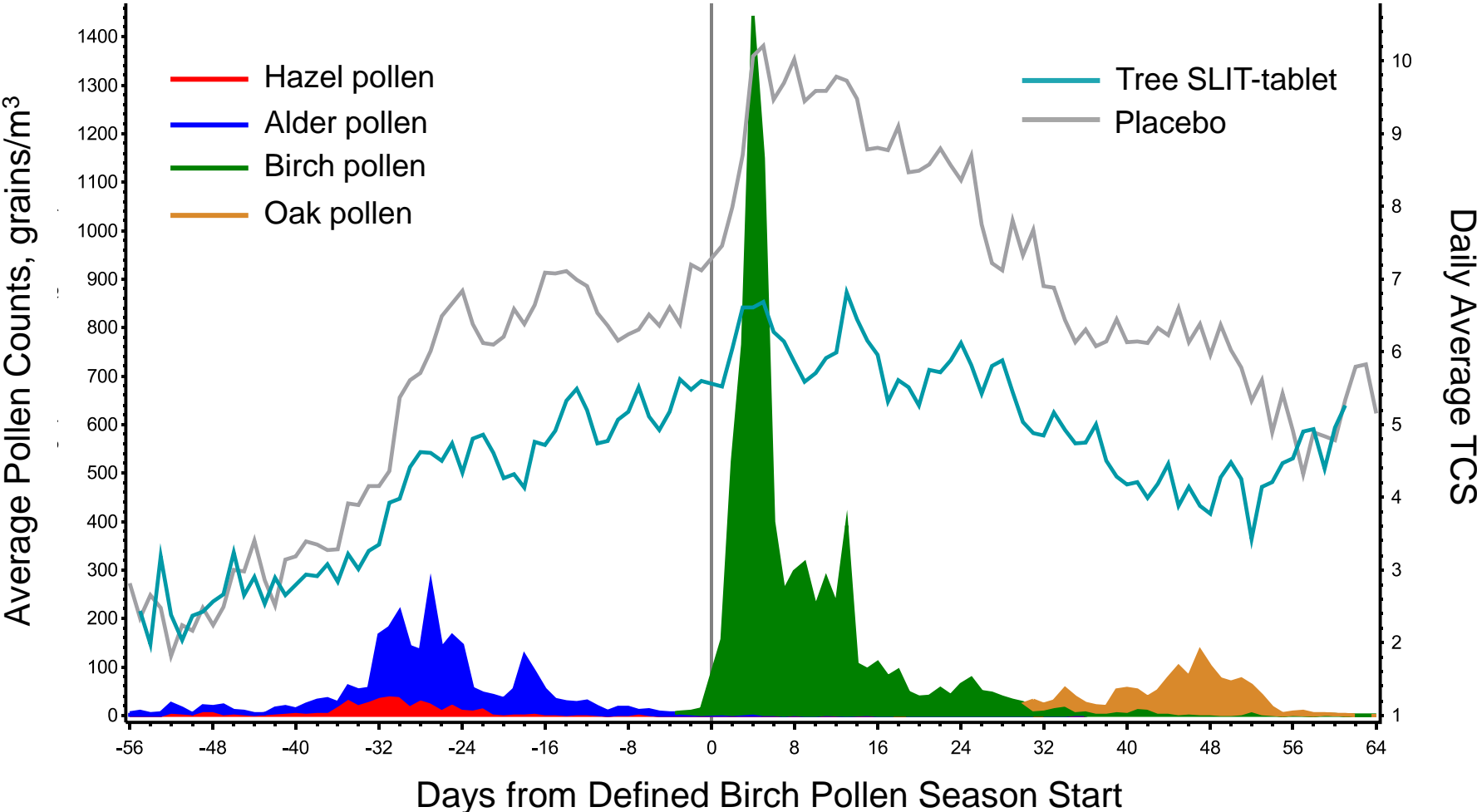
Methods

- In a randomized, multinational, double-blind, placebo-controlled trial conducted in Europe¹, 634 participants (12-65 years) with birch pollen-induced AR/C with or without asthma received a daily tree SLIT-tablet (12 SQ-Bet) or placebo before and during the tree pollen season²
 - Symptom-relieving medication for allergic rhinitis and conjunctivitis was provided to both treatment groups
- Oak pollen season = first day of the 3 consecutive days with at least 10 pollen grains/m³ through the last day of the last 3 consecutive days with at least 10 pollen grains/m³
 - Data from days overlapping the birch pollen season were excluded
- Endpoints: Average TCS (total combined symptom-medication score), average rhinoconjunctivitis daily symptom score (DSS), and average rhinoconjunctivitis daily medication score (DMS) during the oak pollen season
- Serum sIgE and IgG₄ specific for *Betula verrucosa* (Bet v; birch), and *Quercus alba* (Que a; oak) were analyzed by ImmunoCAP

1. EudraCT-2015-004821-15

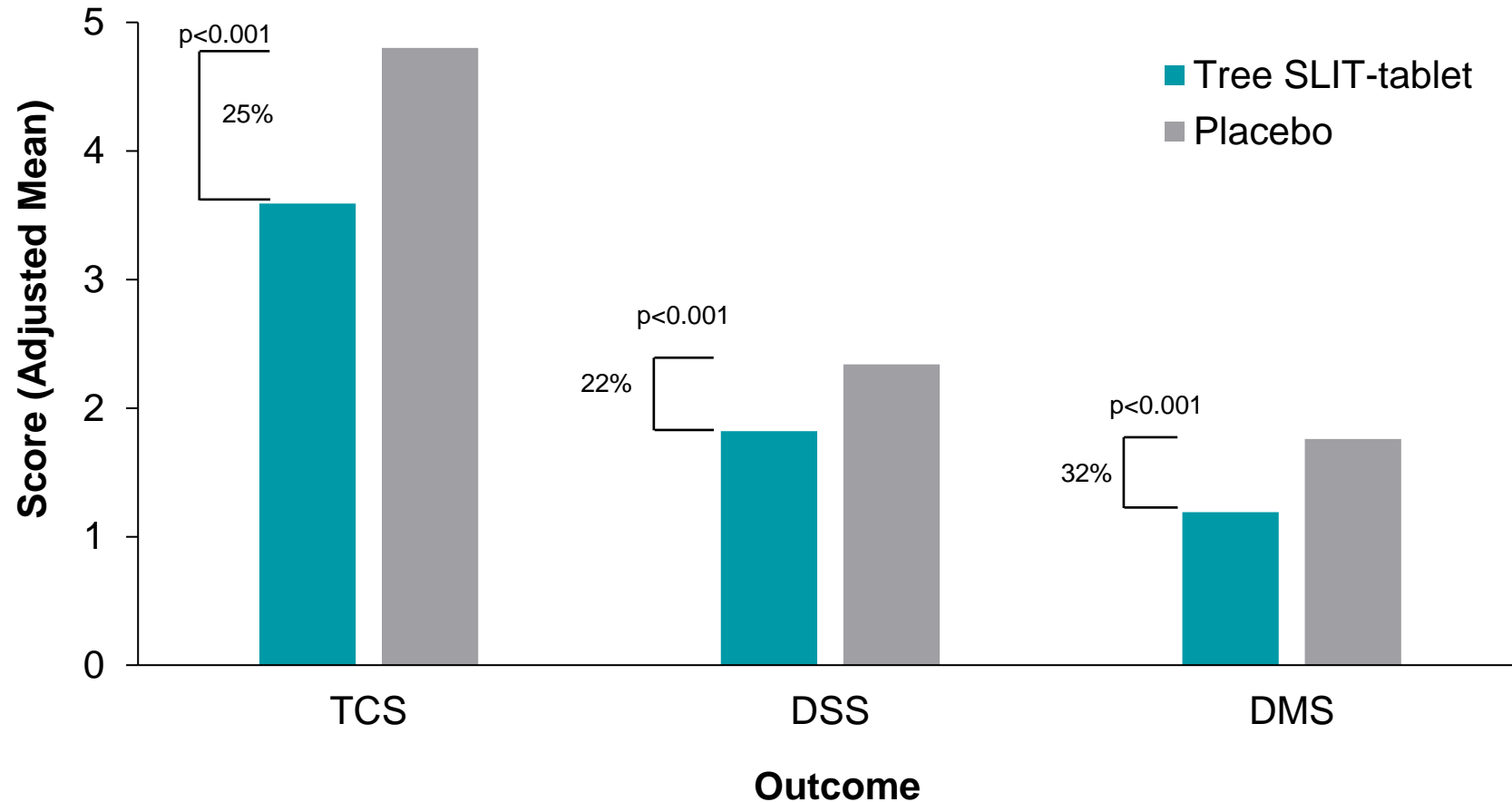
2. Biedermann T, et al. *J Allergy Clinical Immunology*. 2019;143(3):1058-1066.

Sustained treatment effect across all tree pollen seasons



Average TCS, DSS, and DMS were significantly improved vs placebo during oak pollen season

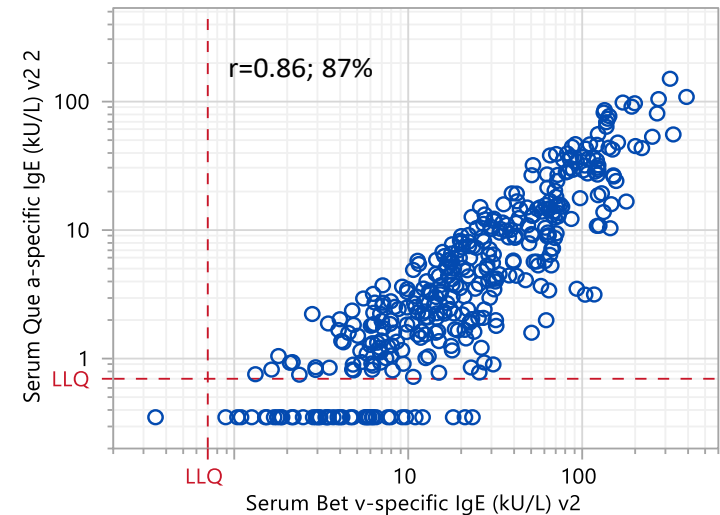
- Only 1% of participants were IgE mono-sensitized to birch pollen while 87% were also sensitized to oak pollen



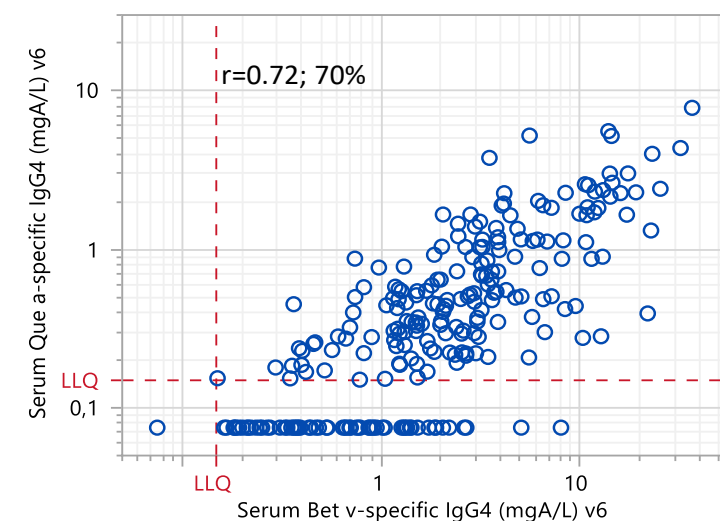
Correlations between birch and oak allergen immunology characteristics support allergen cross-reactivity and cross-reactive responses*

- The majority of the participants demonstrated serum sIgE binding to oak (87%) at baseline
- There was a significant correlation between Bet v (birch) sIgE and Que a (oak) sIgE at baseline ($p < 0.0001$)
- The majority of participants demonstrated serum IgG₄ binding to oak (70%) after tree SLIT-tablet treatment
- There was a significant correlation between Bet v (birch) IgG₄ and Que a (oak) IgG₄ after tree SLIT-tablet treatment ($p < 0.0001$)

IgE at Baseline

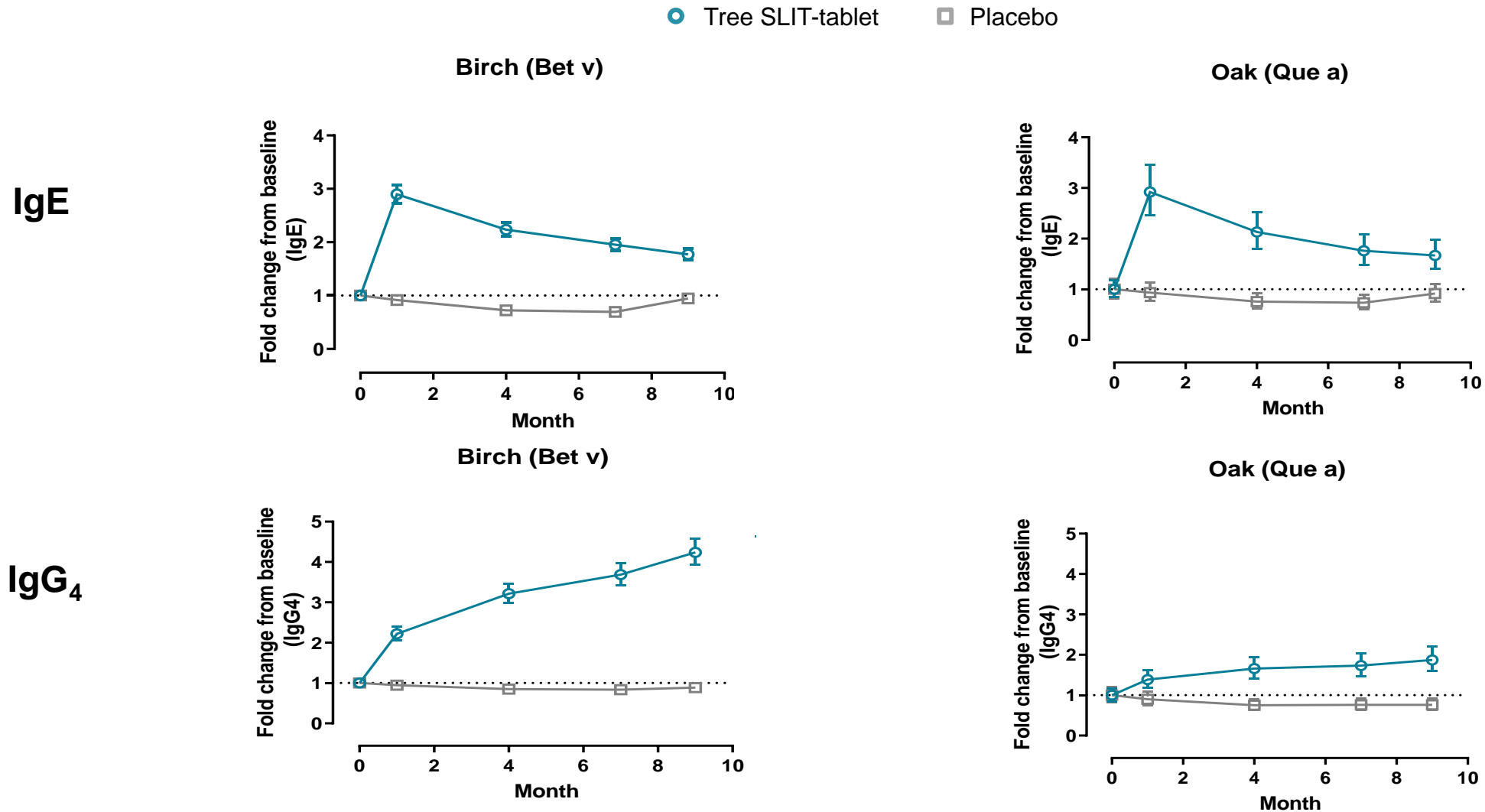


IgG₄ at End of Treatment



*Graphs indicate Pearson correlation r-values and the percentage of samples above the lower limit of quantitation.

Similar kinetics for IgE and IgG₄ induction towards oak allergens support cross-reactivity



P<0.001 vs placebo at all timepoints

Conclusions

- Treatment with the 12 SQ-Bet tree SLIT-tablet resulted in clinically relevant, statistically significant improvements in AR/C outcomes during the oak pollen season
- The tree SLIT-tablet induces oak-specific immunologic changes
- The tree SLIT-tablet could be used to treat oak pollen-related AR/C symptoms and reduce the need for symptom-relieving pharmacotherapy