Hydrolyzed *Lolium Perenne* Peptide Fragments Administered Subcutaneously to Hay Fever Patients Induce Allergen-Specific IgG4 and Blocking Antibodies After Two or More Weeks of Treatment

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Background

- Approximately one-quarter of the population in Western Europe is affected by seasonal allergic rhinitis, more than half of which is due to grass pollen allergy.
- Pharmacotherapy such as antihistamines and corticoids only provide symptomatic relief and do not confer long-term clinical benefit. Allergen immunotherapy (AIT) has been used for more than a century.
- AIT is effective and offers long-term symptomatic relief after discontinuation of treatment. A recent meta-analysis of clinical studies confirms that AIT administered either subcutaneous (SCIT) or sublingual (SLIT) is effective at controlling seasonal allergic rhinitis.
- Current regimens of SCIT have low safety profile compared to SLIT, although SLIT was developed with the aim of improved safety, however it also can cause local and systemic reactions.
- A novel peptide immunotherapy approach for the treatment of grass pollen-induced allergic rhinoconjunctivitis comprises a peptidase hydrolysate obtained from all Lolium perenne allergens (gpASIT+™, Biotech Tools SA). gpASIT+™ consists of highly purified peptidic fragments from natural source.

Methods

- In a prospective, double blind, placebo-controlled, multi-center phase Ib dose-finding study, we evaluated the immunogenicity of three peptide regimens in 198 hay fever patients randomized to receive either placebo or cumulative doses of 70, 170 or 370 µg.
- The four groups were injected subcutaneously once weekly with the peptide mix or matched placebo, reaching their cumulative doses within 2, 3 or 4 weeks, respectively.

Results -1

- Approximately one-quarter of the population in Western Europe is affected by seasonal allergic rhinitis, more than half of which is due to grass pollen allergy.
- Hydrolyzed *Lolium Perenne* Peptide Fragments Administered Subcutaneously to Hay Fever Patients Induce Allergen-Specific IgG4 and Blocking Antibodies After Two or More Weeks of Treatment.

Hypotheses

- Functional blocking antibody responses were evaluated by facilitated allergen binding (IgE-FAB) assay.

Figure 1: Significant improvement in reactivity to CPT in the group receiving 170 µg gpASIT+™ after 4 injection visits (p<0.005) and 5 injection visits (p<0.022)

Figure 2: Grass pollen-specific IgE (A) and IgG (B) antibodies were measured in placebo (n=45), gpASIT+ (70ug, n=49), (170ug, n=49) and 370ug (n=51) treated subjects. *p< 0.05, **p<0.01 and *** p<0.001. Wilcoxon Signed Ranks Test.

Figure 3: Grass pollen-specific IgG4 antibodies (A) and (B) serum inhibitory activity for facilitated allergen binding to B cells were measured in placebo (n=45), gpASIT+ (70ug, n=49), (170ug, n=49) and 370ug (n=51) treated subjects. *p< 0.05, **p<0.01 and *** p<0.001. Wilcoxon Signed Ranks Test.

Conclusions

Subcutaneous Immunotherapy with a novel peptide hydrolysate of *Lolium perenne* grass pollen administered over 2-4 weeks resulted in a dose-dependent increase in ‘protective’ specific antibodies as reflected by highly significant decreases in allergen-IgE-complex binding to B cells in the IgE-FAB assay.

References


Conflict of Interest statement

I have no conflict of interest to disclose