



The effectiveness of sublingual immunotherapy for house dust mite-induced allergic rhinitis and its co-morbid conditions

Aim: We investigated sublingual immunotherapy for mite-induced allergic rhinitis and its comorbid allergic conditions. **Patients & methods:** A prospective case-controlled study of 120 patients (case = 80, control = 40) over 12 months. **Results:** There was 53.6% reduction in total rhinitis symptom score ($p < 0.0001$), but not in controls (-7.3%, $p = 0.99$). The total symptom scores for concurrent asthma decreased from 17.79 to 8.8 ($p < 0.0001$); for allergic conjunctivitis from 20.89 to 10.0 ($p = 0.0002$); for atopic dermatitis from 46.40 to 29.38 ($p = 0.0004$) and 74.6% of patients weaned off nasal topical steroids. The treatment-related adverse reactions were mild and self-limiting. **Conclusion:** Though sublingual immunotherapy may be more expensive than conventional treatments, it was an adjunctive therapy that improved not only the outcomes for allergic rhinitis, but also its comorbid allergic conditions.

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Co-existence of allergic diseases is common in clinical practice. This was highlighted and quantified in some recent meta-analyses [1–3]. However, literature on the effectiveness of allergen immunotherapy (AIT) for allergic rhinitis and the concurrent effect for their comorbid allergic conditions is relatively scarce [4].

Substantial clinical evidence is available to support the use of AIT for patients with allergic rhinitis [5]. Some recent guidelines even suggest that AIT should be considered as the first-line treatment for allergic rhinitis [6]. AIT is the unique disease modifying treatment strategy for allergic diseases [7]. It is well documented in multiple meta-analyses that the immunomodulatory effect can result in long term remission which can last for more than 10 years after treatment has stopped [8–10]. Moreover, AIT has been shown to prevent asthma development and new allergen sensitization in allergic rhinitis patients [11,12]. Recently, the preventive role of AIT introduced at an early age is also being investigated [13].

The underlying mechanism of AIT has been intensively studied and now we understand that it modifies a complex cascade of immune responses at both molecular and cellular levels. These changes that occur during the course of AIT can be categorized into four stages. Stage one: a decrease in mast cell and basophil activity and degranulation is observed within a few hours after AIT. Stage two: allergen-specific Treg and Breg cells are produced within a few days leading to the suppression of allergen-specific effector T cells. Stage three: allergen-specific antibodies IgE to IgG4 ratio decreases substantially in the following few weeks to months. Stage four: decrease in the number of tissue effector cells including mast cells and eosinophils, and decreased in the amount of their mediators in target tissue are observed several months after the start of AIT [14].

There are two types of AIT commonly used for allergic rhinitis, namely sublingual or subcutaneous immunotherapy. Allergen-specific sublingual immunotherapy (SLIT) is more acceptable for the pediatric population as it is less invasive and does not require repeated injections. According to International Study of Asthma and Allergies in Childhood, the prevalence of rhinoconjunctivitis in Hong Kong was 15% among school children aged 9–11 years, which was significantly more common than in Beijing (6.4%) and Guangzhou (7.4%) [15]. Allergic rhinitis