

Jesper Elberling

## Ocular and Respiratory Symptoms Elicited by Perfume and Fragrance Products

### Summary

The thesis was carried out during my employment at the National Allergy Research Centre, Department of Dermatology, Gentofte Hospital, University of Copenhagen, Denmark from September 2001- July 2005.

Ocular and respiratory symptoms related to environmental perfume exposure are frequently reported by subsets of individuals in general populations and by patients referred to clinics investigating diseases in skin and airways. The underlying pathophysiological mechanisms of such symptoms are unknown, and the relative importance of allergic and or inflammatory diseases in skin or airways in relation to the symptoms has been only scantily investigated.

The PhD work was carried out as two separate projects: an epidemiological study (Part 1) and a clinical experimental study (Part 2). For **Part 1** a questionnaire on respiratory symptoms related to perfume and fragrance products was developed and posted to 1189 individuals who had recently participated in a population-based study of allergic diseases. The questionnaire-study **1)** described the occurrence, the character and the severity of ocular and respiratory symptoms related to perfume and fragrance products in the population and **2)** investigated the association between reporting such symptoms and skin prick test reactivity (atopy), metacholine bronchial hyperreactivity (BHR), allergic rhinitis, asthma, hand eczema and patch test reactivity.

For **Part 2** an exposure device for double-blind eye-challenge with perfume was developed. A case control study investigated **3)** the association between reactivity to perfume-provocation and reporting of ocular and respiratory symptoms and **4)** the association between cough responsiveness to capsaicin and the symptoms related to perfume.

The results from **Part 1** indicated that symptoms related to perfume and fragrance products in the population were most frequently reported from the nose, followed by the eyes, lungs, and mouth or throat. No associations were found between these symptoms and atopy. Positive, independent and significant ( $p < 0.05$ ) associations were found between the symptoms and BHR, perfume contact allergy, hand eczema, psychological vulnerability and being a woman. In addition, a positive association was found between respiratory symptoms related to perfume and to airborne chemicals other than perfume. The occurrence of respiratory symptoms related to airborne chemicals other than perfume increased significantly ( $p < 0.05$ ) with increasing number of positive patch tests.

In study **Part 2**, subjective irritation was elicited in the eyes by vapours of perfume independent of olfaction, but the relative importance of ocular chemoperception in relation to elicitation of eye and respiratory symptoms from environmental exposure to perfume is yet to be clari-

fied. Lower but not upper respiratory symptoms were associated with increased capsaicin cough responsiveness.

In conclusion, we found no indications that respiratory symptoms from environmental perfume exposure were caused by IgE-mediated allergy, but various other objective findings were associated with the symptoms independent of psychological vulnerability. These objective findings included BHR, increased capsaicin cough responsiveness, perfume contact allergy as well as self reported hand eczema.