

Contact Allergy to Aluminium

INGRID SIEMUND, MD, PhD

Department of Occupational and Environmental Dermatology, Skåne University Hospital, SE-214 21 Malmö, Sweden. E-mail: ingrid.siemund@med.lu.se

Ingrid Siemund, on September 8, 2017, defended her doctoral thesis titled: "Contact allergy to aluminium". Available from: http://portal.research.lu.se/ws/files/29365156/Contact_allergy_to_aluminium.Ingrid_Siemund.e_version.pdf.

Contact allergy and atopic dermatitis may be present in the same patient. Known comorbidities of atopic dermatitis are allergic asthma and allergic rhinoconjunctivitis, both of which can be treated with allergen-specific immunotherapy (ASIT). Persistent itching nodules and contact allergy to aluminium are known adverse reactions after ASIT with aluminium-containing allergen extracts as well as after immunisation with aluminium-containing vaccines.

The aims of the thesis were: (i) to investigate the presence of contact allergies in atopic individuals with and without childhood eczema, before and after ASIT (Paper I); (ii) to investigate whether ASIT with aluminium-containing allergen extracts during one year induces persistent itching nodules and contact allergy to aluminium (Paper II); (iii) to provide increased knowledge about establishing contact allergy to aluminium (Paper III); and (iv) to study contact allergic reactions to aluminium over time (Paper IV).

Papers I and II are based on a prospective study in atopic individuals suffering from allergic asthma and/or allergic rhinoconjunctivitis. The study participants were treated with ASIT with aluminium-containing allergen extracts during one year. They were patch-tested with aluminium chloride hexahydrate before and during ASIT. At the end of the study all participants were patch-tested with aluminium and the baseline series. Paper III reports on aluminium-allergic volunteers who were patch-tested with 6 different aluminium compounds and an empty Finn chamber®, and also tested intradermally with aluminium chloride hexahydrate. In paper IV the results of repeated patch-testing with aluminium chloride hexahydrate and aluminium lactate in aluminium-allergic volunteers are presented.

The findings were as follows:

- a lower number of contact allergies was found in individuals treated with ASIT,
a higher number of contact allergies was found in individuals with a history of childhood eczema,
- contact allergy to aluminium was found in those treated with ASIT but ASIT was not shown to be a risk factor,



Ingrid Siemund with Professor Lennart Emtestam (Opponent) Department of Dermatology, Karolinska Institutet, Stockholm to the left and Professor Magnus Bruze (Main Supervisor), Department of Occupational and Environmental Dermatology, Lund University, Malmö to the right.

contact allergy to aluminium and itching nodules seemed to be more common in children and in those with a history of atopic dermatitis,

- patch testing with aluminium chloride hexahydrate 2.0% and an empty Finn chamber®, as well as the intradermal test are insufficient to detect aluminium allergy, most positive reactions were noted to aluminium chloride hexahydrate 10 %, iv a) patch test reactivity to aluminium varies over time, iv b) an aluminium-allergic individual may have a false-negative reaction to aluminium.

List of publications

- I. Siemund I, Hindsén M, Netterlid E, Güner N, Bruze M. Contact allergy in atopic individuals in relation to allergen-specific immunotherapy. *Eur J Dermatol* 2016; 26: 271–280.
- II. Netterlid E, Hindsén M, Siemund I, Björk J, Werner S, Jacobsson H, et al.. Does allergen-specific immunotherapy induce contact allergy to aluminium? *Acta Derm Venereol* 2013; 93: 50–56.
- III. Siemund I, Zimerson E, Hindsén M, Bruze M. Establishing aluminium contact allergy. *Contact Dermatitis* 2012; 67: 162–170.
- IV. Siemund I, Mowitz M, Zimerson E, Bruze M, Hindsén M. Individual variation in aluminium patch test reactivity over time. *Contact Dermatitis* 2017 Jul 11 [Epub] Doi: 10.1111/cod.12836.