

# Nickel Allergy and Hand Eczema – Epidemiological Aspects

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**Anna Josefson defended her PhD thesis on December 17, 2010 in Örebro, Sweden. The thesis was supervised by Birgitta Meding, Associate Professor at the Institute of Environmental Medicine, Karolinska Institutet, Stockholm and Gunilla Färm, MD, PhD, Department of Dermatology, Karolinska University Hospital, Stockholm. Her opponent was Professor Bernt Lindelöf, Department of Medicine, Karolinska Institutet, Solna, Stockholm.**

Contact allergy is frequent in the general population and nickel allergy is the most common form. Some nickel-sensitized individuals develop allergic contact dermatitis, while nickel allergy has been discussed as a risk factor for hand eczema. However, hand eczema is one of the most frequently occurring skin diseases and has a multifactorial origin. The aim of this thesis was to study the association between nickel allergy and hand eczema in the general population. In only a few previously published population-based studies has patch testing been performed. In addition, the thesis aimed to evaluate methods for following the prevalence of nickel allergy.

The study cohort consisted of 908 women who had been patch-tested for the occurrence of nickel allergy as schoolgirls. The prevalence of nickel allergy among the schoolgirls was 9%. Twenty years later, they were invited to participate in a follow-up questionnaire study. The response rate was 81%. In total, 17.6% of respondents reported hand eczema after the age of 15 years. There was no statistically significant difference in the occurrence of hand eczema between those who had been nickel-positive and those who had been nickel-negative as schoolgirls. To further investigate possible links, another study was performed. This second study involved a second questionnaire, a clinical investigation and patch testing. All schoolgirls from the baseline study who were still living in the area as adults were invited to participate, and the participation rate was 77%. Patch testing revealed 30.1% of individuals to be nickel-positive. When all participants were included in the analysis, there was no statistically significant difference between nickel-positive and nickel-negative women regarding occurrence of hand eczema. The most important risk factor for hand eczema was childhood eczema. The adjusted prevalence proportion ratio (PPR) for hand eczema after the age of 15 years was 1.03 (95% CI 0.71–1.50) in relation to nickel patch test results and 3.68 (95% CI 2.45–5.54) in relation to childhood eczema. When women with and without history of childhood eczema were analyzed separately, the hand eczema risk was doubled in



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nickel-positive women without history of childhood eczema. In this study, it was also found that most women with nickel allergy did not have symptoms associated with the allergy. In conclusion, the risk of hand eczema in nickel-positive women may previously have been overestimated, and conclusions regarding the occurrence of nickel allergy cannot be drawn from history.

Continuous epidemiological surveillance is necessary to determine the prevalence of contact allergy and to evaluate interventions. It is of special interest to follow the prevalence of nickel allergy to evaluate the effect of the EU Nickel Directive. Population-based studies involving patch testing are the most reliable methods, but are associated with heavy expenses and logistical problems. In this thesis, two different methods for following the prevalence of nickel allergy were validated. First, the validity of self-reported nickel allergy was investigated. In the established cohort, two questions regarding nickel allergy were compared with patch test results. The validity of self-reported nickel allergy was low, and the questions regarding nickel allergy overestimated the true prevalence of nickel allergy. The positive predictive values were 59% and 60%. An-

other method for estimating the prevalence of nickel allergy, namely self-patch testing, was validated in a final study. In total, 191 patients from three different dermatology departments participated. The validity of self-testing for nickel allergy

was adequate, with a sensitivity of 72% and a proportion of agreement of 86%. In conclusion, while self-reports are not at all useful, self-testing might be a useful method, although further studies in the general population are required.

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## Self-reported Acne and Psychosocial Problems

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Jon Anders Halvorsen defended his PhD thesis “Acne and psychosocial problems. Cross-sectional epidemiological studies among adolescents” at the University of Oslo on August 30<sup>th</sup>, 2011. Main supervisors were Lars Lien and Florence Dalgard. The evaluation committee and opponents were Professor Gregor Jemec from Roskilde Hospital (dermatology), Associate Professor Lars Tanum, Akershus University Hospital (psychiatry), and Associate Professor Trine Bjørner, University of Oslo (general practice).

Studies on the epidemiology of acne using large adolescent populations are scarce. The aim of the thesis was to investigate possible associations between acne and psychosocial problems in a general population of 18–19-year-old adolescents.

The first part of the thesis is a validation study on questions regarding five different skin complaints, i.e. acne, dry skin, itchy skin, rash and other skin findings, among 217 adolescents. The adolescents’ answers were compared to skin findings on clinical examination by dermatologists. Self-reported acne showed the highest validity of the skin complaints, and adolescents seem to under-report severe acne.

The second and main part of the thesis is a population survey (The Youth 2004 Study) among late adolescents in Oslo, Norway, with 3,775 participants and an overall response rate of 80%. The question on self-reported acne, validated in the validation study, was used to explore possible associations between acne and psychosocial problems. The prevalence of self-reported moderate to severe acne (“quite a lot” and “very much”) was 13.5%. Social impairment was assessed through six questions and was more frequent in adolescents with acne. In a multivariate model which included symptoms of depression, family income, and ethnicity, both low attachment to friends (odd ratio (OR) 1.52, 95% CI 1.21–1.91), not thriving at school (OR 1.41, 95% CI 1.21–1.91), never had romantic relationship (OR 1.35, 95% CI 1.05–1.70), and never had sexual intercourse (OR 1.51, 95% CI 1.21–1.89) were associated with acne, both in boys and in girls.



*From left to right: Professor Harald Moi (acting dean), Gregor Jemec (first opponent), Jon Anders Halvorsen, Trine Bjørner, and Lars Tanum (second opponent).*

Psychological problems were measured by the instruments HSCL-10 (mental distress, symptoms of depression, anxiety) and SDQ (hyperactivity, emotional symptoms, conduct problems, peer problems), as well as one question on suicidal ideation taken from HSCL-90. There was a statistically significant gradual increase in psychological problems, measured with HSCL-10 and SDQ, with acne severity. OR for psychological problems, measured with SDQ, was 2.25 (95% CI 1.69–3.00) and for mental distress, measured with HSCL-10, 1.91 (95% CI 1.50–2.44)

The OR for mental distress, measured by HSCL-10, did not change when diet was introduced in the model as a confound-

er. This indicates that dietary habits are not a significant risk factor for both acne and mental distress. Although it was not the objective of the study to study associations between acne and diet, our findings indicate that girls with a low intake of vegetables have more acne.

We found a significant association between acne and suicidal ideation, independent of symptoms of depression, ethnicity, family income and sex, with OR 1.80 (1.30–2.50). An increase in suicidal ideation was significantly correlated with an increase in acne severity. Inclusion of social functions in the multivariate model did not change the association between acne and suicidal ideation.

Information from the Norwegian Prescription Database shows that only 27 individuals aged 18–19 years in Oslo dispensed one or more prescriptions of isotretinoin in 2004. This indicates that possible isotretinoin use cannot explain the main findings of the study. Possible underreporting of severe acne may have contributed to underestimating the

strength of the association between acne and psychological problems.

In conclusion, the study indicates a strong association between acne and psychosocial problems and that acne may have profound psychosocial effects. The findings may have implications for clinical practice and health policy decisions.

## References

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