

Environmental factors and atopic predisposition as predictors for the development of asthma, rhinoconjunctivitis and other atopic diseases in mucous membranes in childhood

Lene Annette Norberg

This PhD dissertation was accepted by the Faculty of Health Sciences, University of Southern Denmark, and defended on August 22, 2003.

Official opponents: Jørn Henriksen, Bent Klug, and Hans Christian Siersted.
Tutor: Arne Høst.

Correspondence to: Lene Annette Norberg, Nr. Lyndelsevej 2, DK-5260 Odense S.

Dan Med Bull 2004;51:146.

ABSTRACT

The aim of the dissertation was to establish a birth cohort and investigate the prevalence of atopic diseases in mucous membranes in infancy as well as study the role of genetic and environmental factors with regard to development of atopic diseases and sensitization in childhood.

A prospective non-intervention, observation study of a birth cohort was initiated in 1998. A random sample of 562 infants born at the University Hospital of Odense was followed at regular intervals 0, 3, 6, 9, 12 and 18 months of age. The parents were interviewed. The children were investigated and tested for allergy with skin prick tests and patch tests. Environmental markers were monitored. Blood samples were analyzed for total and specific IgE. Parents and siblings were offered skin prick test in order to evaluate the degree of atopy. Long-term follow-up has been planned at the age of 3, 5, 10 and 15 years.

We found a cumulated incidence at 18 months of age of 25.1% for recurrent wheezing, 0.4% for hay fever and 5.1% for asthma. The cumulated incidence of food allergy/intolerance and cow's milk allergy/intolerance at 18 months of age was 3.4% and 0.9%, respectively.

Compared to an investigation in 1985 in the same area, there was no significant rise in recurrent wheezing, hay fever or food allergy at 18 months of age. The incidence of asthma increased from 1.6% to 5.1%. Whether there is a rise in asthma, or the diagnosis is given earlier in life, can only be evaluated at future follow-up at 5 and 10 years of age.

Evaluated by repeated measurements of specific IgE towards six allergens, the cumulated incidence of sensitization in the cohort was 22.8% and 9.8%, using RAST \geq class 1 and \geq class 2 as cut-off values. Skin prick test showed a cumulated incidence of 10.5% and 6.7% using cut-off values of 2 mm and 3 mm, respectively. There was no association between sensitization and recurrent wheezing in this age group, but a strong association between food allergy/intolerance and sensitization.

Data regarding exposure to passive tobacco smoke in pregnancy and infancy was aggregated with a cohort of newborns with double parental atopic predisposition (n=118). Exposure to passive tobacco smoke during pregnancy and infancy increased the risk of airway symptoms such as recurrent wheeze and wheeze excluding cold and

asthma. With the limitation that sensitization and clinical outcome are evaluated during the first 18 months of life, we did not find any association between exposure to passive tobacco smoke during pregnancy and infancy and an increased risk of sensitization.