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Allergic sensitization to common inhalant allergens and its association to atopic diseases in the elderly: Results of the population based ESTHER study

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Atopic diseases and allergic sensitization are very common in children and young people. Their prevalence has steadily increased during the past decades. The reasons are discussed in several papers, but even if one take environmental and lifestyle factors into account the increase could not be fully explained yet.

But little is known how frequent allergies occur in adults. No prevalence data are published about the elderly population. Our study is the first population-based study exploring the occurrence of allergic sensitization and atopic diseases in people aged above 50 years. The ESTHER study was a good opportunity to estimate the prevalence since this study is a population-based and observational study with a large sample size. Overall, 9949 subjects (mean age 62 years, 45% male) were included in this analysis. The lifetime prevalence of reported atopic dermatitis, hay fever and asthma was 4.3%, 8.3% and 5.5%, respectively. The presence or absence of specific IgE to common inhalants, like house dust mite, timothy grass, cultivated rye, mugwort, dog epithelium, cat epithelium and dander, common silver birch and cladosporium herbarum, was determined in a representative sub sample of 4696 participants. We found a prevalence of 21.2 % for allergic sensitization (24.4 % in males and 18.7 % in females).

Older people will play a greater role in most societies in western countries (especially in Germany) since the demographic development will lead to a growing part of the elderly people in Germany. Most chronic diseases such as cardiovascular diseases, cancer or diabetes mellitus are strongly increasing with increasing age. But not so atopic diseases. We could show that the prevalence of each self-reported atopic disease was decreased with increasing age. Of course, recall bias needed to be discussed since older people tend to have less good

memory and the time since the last symptom may have been longer. However, this age trend could also be clearly observed for the prevalence of allergic sensitization measured by specific IgE in serum samples. Our results are well comparable to other studies in younger adults where similar results were found.

Individuals with a genetic predisposition are at increased risk for atopic diseases but environmental factors are supposed to play an important role too. In our study we determined family history, school education level and community size in adolescents as a possible impact on the occurrence of atopic diseases and allergic sensitization. With our data we could confirm that family history plays an important role for the development of allergies.

Most diseases especially infectious diseases occur more frequently in people with a low socio-economic status compared to those with a higher level. Allergies belong to these few diseases where the prevalence increases with increasing socio-economic status. We could confirm this statement with our results. People with a higher education seem to have a higher risk for atopic diseases and increased specific IgE levels compared to those with a lower education level. Furthermore, the allergic type of each atopic disease is associated with duration of school education. Other published surveys show corresponding results. We found that community size in early days was strongly associated with hay fever and allergic sensitization, but not with AD nor asthma. Moreover, the allergic type of each atopic disease increased slightly with increasing community size during early days. Previous studies have reported about this relationship and found similar results

When looking on the results the following limitations should be considered: the analyses in our study are based on data from an interview in which study participants were asked whether they had ever been diagnosed with an atopic disease by a physician. This makes the study prone to information bias like over-reporting and recall-bias because of differential medical knowledge, understanding, reporting and more public awareness of allergy and atopy due to mass media. However, other studies already demonstrated that self-report with respect to physician diagnosed atopic diseases is a valid means to describe prevalences of atopic diseases in the general population. The serological test *Phadiatop* was shown in several studies to be highly sensitive and specific in differentiating individuals who are sensitized to common inhalants from those who are not. Therefore it is a valuable test for the screening of inhalant atopy. This test used here was additionally a good tool for ensuring the results reported from the questionnaire.