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## Anthroposophic lifestyle is associated with a lower incidence of food allergen sensitization in early childhood



### To the Editor:

Sensitization to food allergens is increasing more rapidly than sensitization to pollen or animal allergens.<sup>1,2</sup> On a population level, development of allergic sensitization commonly begins with food allergen sensitization in early infancy, followed or sometimes replaced by sensitization to animals and later, at 4 to 5 years of age, including sensitization to pollen.

The cause for the onset or development of sensitization to allergens and allergy-related diseases is still not known. Environmental and lifestyle factors are considered to contribute to disease development.<sup>3</sup> Anthroposophy is a holistic philosophy that was founded by the Austrian philosopher Rudolf

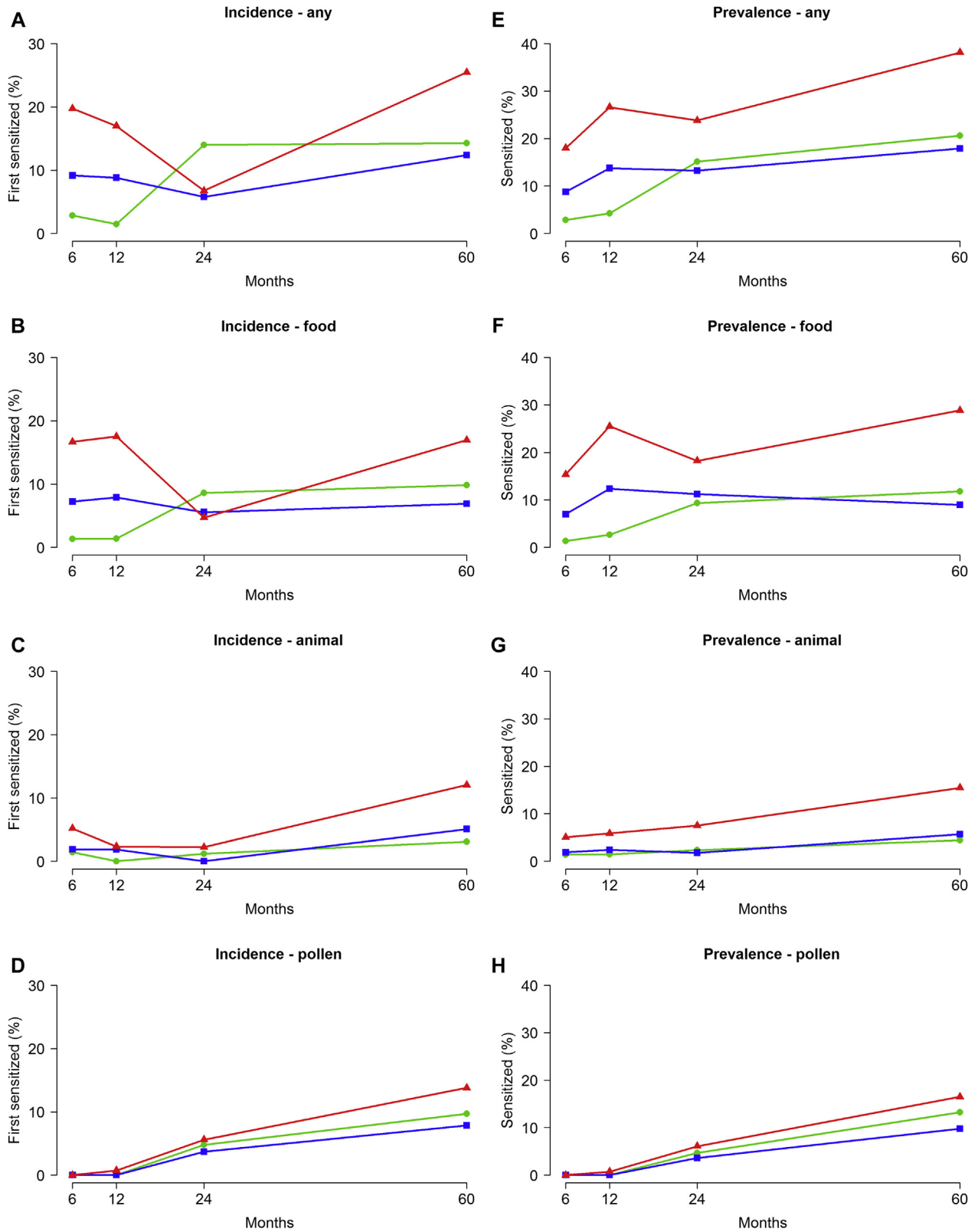
Steiner (1861-1925) and covers most aspects of life, including education, health care, agriculture, and diet.<sup>4</sup> Previous cross-sectional studies have shown that Steiner school children, who often come from families with an anthroposophic lifestyle, have a lower prevalence of sensitization and allergic disease compared with reference children.<sup>5,6</sup> These observations have been confirmed in the prospective birth cohort Assessment of Lifestyle and Allergic Disease During Infancy (ALADDIN).<sup>7</sup>

In Hesla et al,<sup>8</sup> we report the clinical manifestations up to 2 years of age in the ALADDIN cohort and provide a description of demographics and early lifestyle exposures. We observed that anthroposophic lifestyle was associated with a reduced risk of reported food hypersensitivity and reported recurrent wheeze but not eczema. Moreover, delayed washing of the newborn's whole body (after 7 days of age) was associated with a reduced risk of allergen sensitization, whereas an increased risk was seen for children who had a mother who worked during pregnancy. However, much of the effect of anthroposophic lifestyle on allergen sensitization was unexplained. In this letter we report how the association between lifestyle and sensitization to food, animal, and pollen allergens differs with the child's age.

For complete materials and methodology, see the **Methods** section in this article's Online Repository at [www.jacionline.org](http://www.jacionline.org). Briefly, this study is based on the Swedish prospective cohort ALADDIN,<sup>7</sup> in which 552 children and their families were followed using questionnaires, examinations, and blood samples. The families were classified into 3 lifestyle groups (anthroposophic, partly anthroposophic, and nonanthroposophic). Blood samples were collected from the children at 6, 12, 24, and 60 months of age. Sensitization to food (hen's egg, cow's milk, and/or peanut), animal (dog and/or cat), and pollen (birch and/or timothy) allergens was determined. IgE values of 0.35 kU<sub>A</sub>/L or greater were regarded as being sensitized. Incidence and prevalence of sensitization were determined. The inclusion process and distribution of children and available blood samples are presented in **Fig E1** in this article's Online Repository at [www.jacionline.org](http://www.jacionline.org), and prevalences of IgE sensitization for the individual allergens are presented in **Table E1** in this article's Online Repository at [www.jacionline.org](http://www.jacionline.org). As described in Hesla et al,<sup>8</sup> several demographic and early lifestyle exposures differed between the lifestyle groups; however, neither parental sensitization nor parental report of allergy-related disease were associated with anthroposophic lifestyle. In addition, parental sensitization was not associated with child sensitization.

Incidence proportions of sensitization for the different allergen categories are presented in **Fig 1, A to D**. In the nonanthroposophic group the incidence proportions of food allergen sensitization were high up to 12 months of age: 15% and 16% were first time sensitized for the age periods of 0 to 6 and 6 to 12 months, respectively, and then decreased to 5% from 12 to 24 months to increase again to 16% from 24 to 60 months. In contrast, in the anthroposophic group the incidence proportions of food sensitization were low at up to 12 months of age and similar for the 4 age periods as follows: 1% (0 to 6 months), 1% (6-12 months), 8% (12-24 months), and 9% (24-60 months). In the partly anthroposophic group the incidence proportions of food allergen sensitization were stable, around 7% for all age periods. In all lifestyle groups sensitization to animal and pollen allergens occurred later than to food allergens.

We used general estimating equation models to study the interaction between age and lifestyle and found that age significantly modified the association between lifestyle and



**FIG 1.** Incidence proportions (A-D) and point prevalences (E-H) of IgE sensitization (IgE  $\geq 0.35$  kU<sub>A</sub>/L) to food (cow's milk, hen's egg, and/or peanut), animal (dog and/or cat), and pollen (birch and/or timothy) allergens in children of families with anthroposophic (green), partly anthroposophic (blue), and nonanthroposophic (red) lifestyles.

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