

Food Allergy: An Increasing Problem for the Elderly

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Key Words

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Abstract

As populations become older all over the world, allergic reactions in elderly persons will be encountered more often in the future. Up to now, there has been much more literature on allergy prevalence in childhood than on allergy diseases in adults. As a challenge to epidemiology, allergic disorders in elderly persons may be masked by various symptoms corresponding with a general age-induced decline of physiological functions, including vitamin D deficiency and gastric pH increase. How much structural and functional changes (e.g. low calcitriol level) or effects caused by drugs (e.g. acid-suppression medications) in addition to immunological alterations encountered at old age are responsible for this development is a matter of debate. In the years ahead, the problem of allergy in adulthood and especially in the elderly will become more pronounced.

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Prevalence rates of allergic diseases have been increasing worldwide over the last decades, especially in industrialized countries [1–6].

Allergic diseases are often regarded as pediatric problems since some of them start in early childhood. It is a

common belief that allergies may spontaneously disappear in adulthood; in some textbooks and earlier recommendations, allergen-specific immunotherapy is not considered for patients over 50 years of age [6].

It is therefore very valuable that the group of Erika Jensen-Jarolim has opened the debate on the issue whether food allergy (FA) is only a pediatric disease [1]. There is much more literature on allergy prevalence in childhood than on allergy diseases in adults; however, the world's population is becoming increasingly older.

In 2000, one fifth of the population in developed countries was aged 60 years or more, and by 2050 this is expected to rise to one third [2]. In the past, the increase in life expectancy was driven mainly by declines in mortality in early and middle life. Since the 1950s, falling age-specific death rates among the oldest age group have been encountered [7, 8].

Allergic reactions in the elderly have not been in the focus of many studies conducted thus far. A variety of symptoms involving cutaneous (e.g. urticaria, angioedema, eczema), respiratory (rhinitis, asthma), gastrointestinal (diarrhea) or generalized anaphylactic reactions may be encountered [9]. Table 1 depicts prevalence rates of several disorders seen in allergic reactions of adults with a focus on elderly persons as reported by different countries.

For FA, a definite increase in prevalence in infancy and childhood is noticed [7, 18]. As these children reach adulthood, a proportion of them will face a persistence of

Table 1. Atopic eczema, asthma, urticaria, angioedema and food anaphylaxis encountered in adults/elderly persons

Age, years	Study year	Country	Prevalence	Annotations	Ref.
<i>Atopic eczema</i>					
27–57	1999/2001	Switzerland	0.3%	Self report and lab.	10
27–57	1999/2001	Spain	0.8%	Self report and lab.	10
27–57	1999/2001	Germany	0.8%	Self report and lab.	10
27–57	1999/2001	Belgium	2.4%	Self report and lab.	10
27–57	1999/2001	Italy	1.4%	Self report and lab.	10
27–57	1999/2001	France	3.4%	Self report and lab.	10
27–57	1999/2001	UK	4.9%	Self report and lab.	10
27–57	1999/2001	Iceland	1.4%	Self report and lab.	10
27–57	1999/2001	Norway	3.0%	Self report and lab.	10
27–57	1999/2001	Sweden	3.3%	Self report and lab.	10
27–57	1999/2001	Estonia	6.2%	Self report and lab.	10
27–57	1999/2001	USA	2.4%	Self report and lab.	10
50–59	2000/2002	Germany	5.3%	Self report	11
50–69	2007/2008	Japan	2.5%	Physician examination	12
60–69	2000/2002	Germany	3.9%	Self report	11
67.2 ± 5.4	2008	Mexico	0.6%	Physician examination	13
70–74	2000/2002	Germany	3.4%	Self report	11
<i>Asthma</i>					
35–64	1999	USA	13.7/100,000	Hospital admission	14
50–59	2000/2002	Germany	5.6%	Self report	11
55 and over	2003	Australia	11.7%	Self report	15
60–69	2000/2002	Germany	5.5%	Self report	11
60–74	1999/2000	Austria	2.7% (m)	Self report	16
60–74	1999/2000	Austria	3.8% (f)	Self report	16
67.2 ± 5.4	2008	Mexico	3.6%	Physician examination	13
70–74	2000/2002	Germany	5.3%	Self report	11
75 and over	1999/2000	Austria	0.0% (m)	Self report	16
75 and over	1999/2000	Austria	6.3% (f)	Self report	16
85	2006	UK	4.8%	Physician examination and record review	7
<i>Urticaria</i>					
60–74	1999/2000	Austria	2.0% (m)	Self report	16
60–74	1999/2000	Austria	2.4% (f)	Self report	16
65 and over	2004/2005	Australia	8/100,000	Hospital admission	17
67.2 ± 5.4	2008	Mexico	2.7%	Physician examination	13
75 and over	1999/2000	Austria	2.8% (m)	Self report	16
75 and over	1999/2000	Austria	0.7% (f)	Self report	16
<i>Angioedema</i>					
65 and over	2004/2005	Australia	18/100,000	Hospital admission	17
<i>Food anaphylaxis</i>					
65 and over	2004/2005	Australia	2/100,000	Hospital admission	17

f = Females; m = males; lab = laboratory analysis.

their problem [8]. Furthermore, previously unaffected individuals may develop symptoms of FA during adulthood for the first time [9].

Up to 25% of adults believe that they or their children suffer from FA. The actual prevalence seems to be lower:

approximately 5–8% of children and 2–3% of adults suffer from objective food hypersensitivity [19].

In Germany, a 2004 study determined a point prevalence of food hypersensitivity proven by double-blind, placebo-controlled food challenge of 2.6% (95% CI: 2.1–

3.2) in the general population aged 18–79 years [20]. It is a matter of debate how much structural as well as functional changes of the mucosa and skin, in addition to immunological alterations affecting, for example, lymphocytes and lymphokines, encountered at old age are responsible for these figures [21–23].

Adverse reactions to food may differ in their pathophysiology encompassing both allergic and non-allergic hypersensitivity reactions [9]. Nevertheless, IgE-mediated food reactions are the most completely understood and best studied [9, 24].

Fortunately, the rate of fatal FA reactions is very low [5]. As demonstrated by pooled data from the American Academy of Allergy, Asthma and Immunology registry of anaphylactic deaths in the USA, 89% of 63 reported cases occurred in adolescents and adults, with approximately 50% occurring in teenagers [25]. Peanuts were the causative allergen in approximately two thirds of cases affecting subjects over 10 years of age [25].

As a challenge to epidemiology, allergic disorders in older persons may be masked by various symptoms corresponding with a general age-induced decline of physiological functions. As a possible consequence, characteristic symptoms of allergy may go unnoticed and may contribute to false low prevalence rates [9].

As outlined by Diesner et al. [1], an increase in gastric pH due to acid-suppressive medications of elderly persons may retain the sensitizing and eliciting capacity of an ingested allergen.

Gastrointestinal pathology encountered more often at older age may further contribute to less gastric acidity [26].

Furthermore, the often low calcitriol level in old people may play a role in the pathogenesis of allergic disorders [1]. In an animal model, calcitriol was found to prevent allergic asthma [27]. This finding is in contrast to results from another working group [28] who demonstrated a predisposition to Th/Tc2-mediated allergic reactions caused by calcitriol. Due to interaction of calcitriol with the vitamin D receptor, genetic variants of the receptor with susceptibility to atopic disorders as well as allergies in the elderly will be the focus of further research [29].

At older age, FA has to be delineated from allergies caused by other allergens. Figure 1 depicts the data of an Italian study from Bari conducted among 137 persons of at least 65 years of age (mean age 70.69 years; range 65–96) in 2008 [21].

FA caused by fruits, vegetables, tree nuts, peanuts and seafood seem to be most prevalent in adults [9, 10, 21]. Sensitization may occur directly to food allergens or indirectly through cross-reactivity with aeroallergens. As a

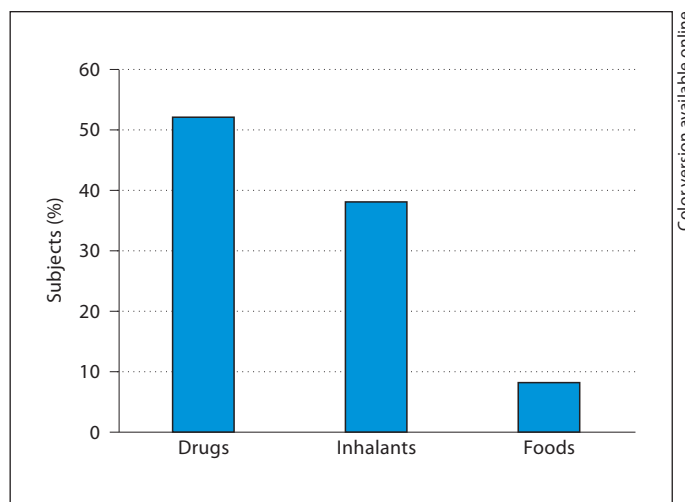


Fig. 1. Incidence of allergic disease in subjects 65 years of age and older (n = 137) from Bari, Italy [21].

characteristic example for the latter, adult atopic eczema patients with hypersensitivity to birch pollen react with worsening of eczema after oral challenge with birch pollen-related foods, and a birch pollen-specific T-cell response can be found in the lesional skin of these patients [9, 24]. Food allergens may also elicit a sensitization through inhalation in certain occupational settings. In this case, primarily respiratory symptoms are encountered [9].

Another aspect deals with gender. Some studies suggest that females might suffer from adverse reactions to food more often than males [19, 20].

In one German study, the lifetime prevalence of allergic diseases in women overrides male affection (47 vs. 33%) [30]. An extremely high prevalence rate was encountered among West German women in the age group of 30–39 years [30]. In a recent Italian study from Bari [21], food allergies were present in 27.2% of males versus 72.8% in females, all with at least 65 years of age.

In an effort to explain these findings, testosterone is known to inhibit histamine release from mast cells, whereas estrogens promote mast cell degranulation [31–33]. Additionally, female hormones increase the expression of histamine receptors on inflammatory cells and may promote eosinophilic inflammation [34].

Therefore, a modulation of the allergic immune response by hormones as well as socio-cultural factors may contribute to gender differences encountered [8, 21, 34].

The problem of allergy in adulthood and especially in the elderly will become more pronounced in the future.

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