RESEARCH ARTICLE

Epidemiological case study of food allergy in a sample of Albanian population between the ages of 18 to 25

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Abstract

Food allergy is an immunological response to food proteins. It is also known as food hypersensitivity. Food allergy reactions can be classified into two types: IgE mediated reaction and non-IgE allergic reaction. Diagnosis methods for food allergy are complicated because even the detection of specific IgE (sensitization) does not necessarily mean that the patient is food allergenic. Therefore it is very important to elaborate a careful medical history by the allergologist for each patients and then to continue with laboratory studies such as Skin Prick Test, detection of food specific IgE from blood serum. This study is a pilot project that was focused in the determination of food allergy prevalence in an Albanian population samples between the ages of 18-25. We have examined a sample of 231 patients from different regions of Albania. Also we have elaborated their historical background in food allergy by using a standardized questionnaire. After that the patients that self-declare food allergy were examined with Skin Prick test and with RAST test for the presence of specific IgE from a panel of food. The results obtained show that 9.9% of the patient self-declare food allergy, but only four of them have a real food allergy or 1.7%. The main types of food that cause allergic symptoms in patients that self-declare allergy are milk and eggs respectively 48% and 26%. All the data collected were analyze with statistical program SPSS 17.00. There is a correlation **(R^2=0.319)** between self reported food allergy and the detection of specific IgE which is significant ($p<0.05$) at the 0.05 (95%) level (Pearson correlation, 2-tailed).

Keywords: IgE mediated reaction; self-declare food allergy; Skin prick Test; RAST test.

1. Introduction

Specific foods or components presents in food can cause adverse immunological responses which are classified as allergic reaction to food [18]. There are nearly 160 different foods that can trigger an allergic reaction [10]. From the other hand scientists have estimated that only 8 types of foods can cause 90% of allergies cases in human population. These foods are milk, egg, crustacean, fish, nuts, soy, wheat and peanut. But according to the EuroPrevall study some fruits such as peach) and hazelnut were the most common allergen sources, often in association with pollen. Food allergy is a very serious condition. The symptoms from food allergy varies from mild such as dizziness, headache, itchy, fatigue, vomiting etc, to severe symptoms that includes gastro-vascular system, respiratory track [13]. The most problematic allergic reaction is anaphylactic shock which it can be life threatening, and the symptoms include a drastic low of blood pressure, cardiac arrhythmia etc [18]. Due to the impact of food allergy in health population, it is mandatory, under EU laws that these food or ingredients present in food should be labeling properly (Directive 2007/68/EC and the Regulation No 1169/2011) [4, 12]. The global trends on food allergy in human population have not been well studied [17]. There have been publication/reviews on Food allergy prevalence but those dates are mainly collected from countries such as Western Europe and North America [15]. But it's worth mentioning that these dates are based on self reported reaction not in clinical analysis such as determination of specific IgE or SPT (skin prick test) [15]. The EuroPrevall study [9] was mainly focus in determination the prevalence of food allergy in European countries mainly by measuring the specific IgE from a panel of food. Due to the fact that Albania isn't part of EU, it was not one of the countries were the EuroPrevall study was extended. Furthermore there are some sporadic publications on food allergy in Albania mainly in infant/children but there is very difficult to find date about the epidemiological background of food

allergy in Albania population [3, 8]. Based on that, the aim of this study was to elaborate data that are taken from a sample of 231 adults from different region of Albania, in order to provide a current "snapshot" of food allergy prevalence in Albania. Also according to different publications the adverse food reaction are becoming really problematic issues for adults [16].

2. Material and Methods

The method used for the detection of food allergy in an Albanian population sample is based on EuroPrevall study. At first we used a short questionery, which was mostly developed based on the pre-existing EuroPrevall questionnaires. The survey was undertaken in public institution (University of Tirana, Agricultural University of Tirana, and Medical University of Tirana) and under the survey of the Alergologies. Subjects completing the questionery were intended to form a representave sample of 18 to 25 years adults. Based on the questionery we collect data about their adverse food reaction, if they have experience different symptoms after food consumption such as vomiting, diarrhea, urticaria, difficulties in breathing etc. Also from the questionery we collected data about their historical background, if any of their family members has experience food allergy reaction. In the second stage the screening of the questionery was carried on by the allergologies. The subjects that have self-reported food allergy were subjected to Skin Prick Test, while in the third stage these subjects were subjected to serological analysis in specialized clinics after blood samples were taken. The level of serum IgE to a panel of 30 (thirty) foods were measured using an ImmunoCAP 250 system at Balkans Laboratory.

3. Results and Discussion

Food allergy has an important impact in public health due to the fact that it has a great economic and social cost [11]. There are a few scientific publications for the prevalence of food allergy in Albania population. The main objective of this study is to determinate the prevalence of food allergy in a sample of Albania population between the age of 18 to 25 years. The study was focused on IgE mediated allergies to a number of foods that cause Type I allergy. The total number of the subjects that filled the questionery was 231 adults. Due to the fact that the questionery gives information about the members of families of each subject, in total we collect information about food allergies for 1080 adults. The subjects were from different regions of Albania as it is showed in Figure 1 and they temporally live in Tirana. From the data that we have collected from the questionery it results that only 23 (9.9%) subjects self-reported food allergy. This is an expected outcome in reference with literature [15] where the number of the subjects that self-declare food allergy is much higher that the real food allergy situation (Table 1).

Figure 1: Geogarfic distribiution of the subjects that has filled the questionary

Table 1: General information about the patients that self-declare food allergy

Patients code	self declare alergy		Types of Food causing allergy	onset age of allergy	Symptoms				Family members		Family Members with food allergy	Types of Food causing Allergy	Specific IgE
	Yes	No			Skin	gastro-intesinal	Respiratory sistem	circulatory sistems	Adults	Children			
31	*		chocolate, eggs	19 to 25	yes	no	No	no	2	3	1	chocolate, eggs	
41	*		milk	10 to12	no	yes	No	no	2	3	1	milk	positive
42	*		meat, milk	7 to 9	yes	no	No	no	2	2	0	milk	positive
28	*		milk	16 to18	no	yes	No	no	2	2	1	milk	negative
35	*		chocolate, honey	I don't know	no	yes	No	no	2	2	0	absent	positive
92	*		chocolate, nuts	3 to 6	yes	yes	No	no	2	2	0	absent	negative
94	*		milk	13 to15	yes	no	No	no	2	2	0	absent	negative
100	*		celery	10 to 12	yes	yes	yes	yes	2	2	1	celery	negative
95	*		milk	10 to12	no	no	yes	no	2	2	0	absent	positive
73	*		I don't know	19 to 25	yes	no	no	no	2	3	0	absent	negative
55	*		eggs, milk, mustard	10 to12	yes	no	no	no	2	2	2	fish, eggs, mustads	negative
43	*		mustard	16 to 18	yes	no	no	no	2	2	1	molusque	negative
48	*		fish, gluten	16 to 18	yes	no	no	no	2	2	0	absent	negative
51	*		fish, nuts	10 to 12	yes	yes	yes	no	2	3	2	nuts, eggs	negative
53	*		fish, eggs	19 to 25	yes	no	no	no	2	4	1	eggs	negative
301	*		eggs	I don't know	yes	no	yes	no	2	3	0	absent	negative
319	*		eggs	13 to 15	yes	no	no	no	2	1	0	absent	negative
268	*		mustard	16 to18	yes	yes	yes	no	2	2	0	absent	negative
252	*		milk	19 to 25	yes	yes	yes	no	2	2	1	milk	negative
310	*		milk, celery	16 to 18	yes	yes	no	no	2	3	0	absent	negative
287	*		milk	7 to 9	yes	yes	no	no	1	2	0	absent	negative
168	*		I don't know	16 to 18	yes	yes	yes	no	2	3	0	I don't know	negative
10	*		eggs	10 to12	yes	yes	yes	no	2	2	0	absent	negative

The main types of food that cause allergic symptoms in patients that self-declare allergy are milk and eggs respectively 48% and 26% (Figure 2a). 83 % of the subjects that filled the questionery declare that had skin symptoms (urticaria, rush etc) after food consumption. 52 % of the subjects declare gastro-intestinal symptoms (vomiting, diarrhea etc), 34% reported respiratory track symptoms and 4% blood pressure symptoms (Figure 2b).
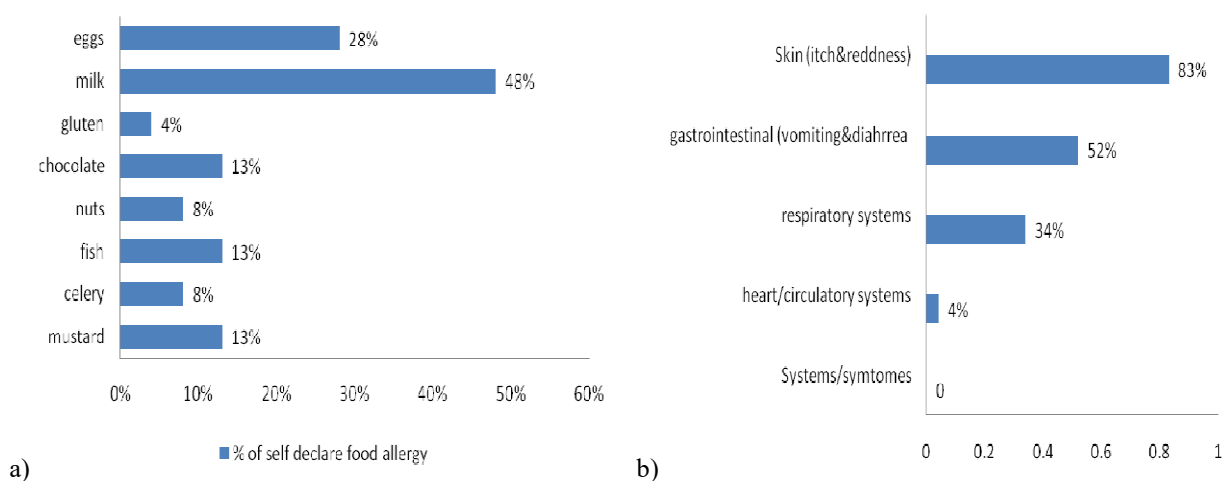

a)

b)

Figure 2. a) % of patients that self-declare allergic symptoms after food consumption b) % of self-declared symptoms after food consumption

Only one patient from a total of 23 that self reported food allergy resulted positive in Skin Prick Test. And four patients from these total resulted positive from serological analyses, positive detection of specific IgE from egg, crustacean, nuts and gluten consumption.

Figure 3: Performing Skin prick Test (SPT) in one of the patients that self-declare food allergy

All the data collected were analyzed with statistical program SPSS 17.00. There is a correlation **(R^2=0.319)** between self reported food allergy and the detection of specific IgE which is significant (p<0.05) at the 0.05 (95%) level (Pearson correlation, 2-tailed). There is no correlation between the presence of symptoms reported from the patients and the positive detection of specific IgE. And also there are no significant correlations between the types of food reported from the patients that cause allergy and a positive detection of specific IgE.

4. Conclusions

Albania is one of the few countries in Europe that do not have an accurate or current prevalence date on food allergy in infants, children and in adults. There have been a few publications about food allergy in Albania region, but despite that the lack of data is evident. We carry on this study as a pilot project in order to collect the first data about the prevalence on food allergy in adult Albanian population. The second reason has to do with the dramatically increase of food allergy mainly in infants and children according to different studies around the world [14, 17]. Furthermore the tendency of growing rates in food allergy is evident even in economic transition country such as Albania. The genetic factor may be one the main reason but different studies have found that populations with similar genetic backgrounds may have different prevalence of food allergies and vice versa [5]. So other factors such as demographic distribution of population, environmental factor or changes in dietary [2] may have a great impact in growing rates of food allergy. According to the historical background of Albania these factors mention above may be the main reason of the growing tendency of self-reporting and parent-reporting of food allergy near the alergologies. By the end of the 80s the political situation in Albania change and with it many social habits change. So Albania citizen begin to move from rural regions (within Albania) to cities that could offer them different possibilities and this has change the demographic distribution of the population [7]. Now in Albanian you can find cities that are over crowed and suffer from air, water and earth pollution such as Tirana, Durres, Fier etc. With the borders open and this era of globalization the Albanian consumer are free to travel all around the world and also the foods are traded globally. This has exposed the consumers with consumption of new foods resulting in changing of dietary habitats. But in general we think that one of the main reasons is the use of chemicals, hormones from farmers that cultivate crops or fish farmers without criteria [1, 6]. Mainly they do not have an educational background and experience despite of they are working in a sector that requires high levels of skill and professionalism. From this pilot study we have obtain the first date about the epidemiological background of food allergy in Albania population between the ages of 18 to 25. Only 9.9% of the subjects self-declare food allergy, but only four (1.7%) of them resulted positive in detection of specific IgE from blood serum from a panel of 30 foods. They resulted positive in detection of specific IgE of egg, crustacean, nuts and gluten. But the main foods that cause allergies symptoms, from the whole sample that we analyzed, were eggs and milk, respectively 48% and 26%. And the main symptoms observed in these patients were those related to the skin (urticaria, rush etc) and those related to the gastro-intestinal apparatus (vomiting, diarrea etc).These

data presented in this publication are preliminary data about epidemiology of food allergy in Albania. This is an ongoing study and we are still collected data from different region of Albania and from a different range of age.

5. References

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