Challenges Parents Face While Trying to Coping with Food Allergic Children Who Had Experienced Anaphylaxis

Besin İlişkili Anafilaksi Yaşamış Çocuklarla Başa Çıkmada Ebeveynlerin Karşılaştığı Sorunlar

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ABSTRACT

Objective: Parents of children with food allergy (FA) have to feed their children safely while they are trying to prevent exposure to the offending food. In this study we aimed to identify their problems in order to help developing measures for improving quality of life of parents of children with FA.

Material and Methods: A prospective multicenter study was carried out in Turkey between May 2015 and January 2016. Study participants included parents of children who had anaphylaxis due to FA. A face to face questionnaire was used.

Results: Parents of 70 patients were included of which, 62.9% were male, and median age was 48.5 months. Fifty percent had problems about family life, 51.4% had problems about outside activities. While 74% reported they helped each other, 22% claimed they had problems with their spouse because of FA. Of the parents, 80% were anxious and 75.7% reported they overprotect their children; 52.9% had problems about school life and 12.9% reported that school did not want to register their children. Of parents, 54.3% had problems with friend relations, 10% of parents reported that their children were alienated by their friends. Seventy percent know how to use adrenaline auto-injector (AAI) but 40% were afraid to use. Occupied mothers, mothers with lower education and parents of children with cow's milk allergy were more often affected ($p<0.05$).

Conclusion: Health care workers must be aware of the problems of parents and be prepared to help them. Parents must be informed about AAI use in every visit.

Key Words: Anaphylaxis, Food allergy, Quality of life

ÖZ

Amaç: Besin alerjili çocuğu olan ebeveynler, çocuklarının alerjik besinden kaçınarak güvenli şekilde beslenmesini sağlamaya çalışmaktadırlar. Bu çalışmada besin alerjili çocuğu olan ebeveynlerin yaşam kalitesini iyileştirmek için karşılaştıkları sorunların değerlendirilmesi amaçlandı.

Gereç ve Yöntemler: Çalışma Türkiye'de Mayıs 2015 - Ocak 2016 tarihleri arasında çok merkezli olarak yapıldı. Çalışmaya besin ilişkili anafilaksi öyküsü olan çocukların ebeveynleri dahil edildi. Katılımcılara yüz yüze anket uygulandı.

Bulgular: Çalışmada besin ilişkili anafilaksisi olan, ortanca yaşları 48.5 ay ve % 62.9'u erkek cinsiyette 70 hastanın ebeveynleri değerlendirildi. Ebeveynlerin %50'sinde aile yaşamıyla ilgili, %51.4'ünde ise ev dışı aktivitelerde sorun vardı.

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Besin ilişkili anafilaksisi olan çocuklarıyla ilgili sorunlar karşısında ebeveynlerin %74'ü iş birliği içindeyken, %22'sinde eşler arasında sorunlar yaşanmaktaydı. Ayrıca ebeveynlerin %80'i aşırı endişeli, %75.7'si ise çocuklarına karşı aşırı korumacı olarak değerlendirildi. Ebeveynlerin %52.9'u çocuklarının okul ile ilgili, %54.3'ü çocuklarının arkadaş ilişkilerinde sorunları olduğunu, %10'u çocuklarının diğer çocuklar tarafından dışlandığını ve %12.9'u ise okulun çocuklarını kaydetmek istemediğini bildirdi. Adrenalin otoenjektör kullanmayı bilen ebeveyn oranı %70 olup, %40'ı otoenjektör kullanmaktan korkmaktaydı. Çalışan annelerin, düşük eğitim düzeyindeki annelerin ve inek sütü alerjili çocuğa sahip olan ebeveynlerin, diğer ebeveynlere göre besin alerjisi nedeniyle daha fazla sorun yaşadıkları görüldü ($p<0.005$).

Sonuç: Sağlık çalışanları besin ilişkili anafilaksisi olan çocuğa sahip ebeveynlerin sorunlarının farkında olmalı ve onlara yardım etmeye hazır olmalıdır. Ayrıca her ziyarette adrenalin otoenjektör kullanımı hakkında ebeveynler bilgilendirilmelidir.

Anahtar Sözcükler: Anafilaksi, Besin alerjisi, Yaşam kalitesi

INTRODUCTION

Food allergy (FA) is an important health problem which effects up to 8% of children (1). Besides its risk of life-threatening reactions, it also has a remarkable impact on quality of life (QoL) for both children and their parents (2). Although some curative treatments such as immunotherapy are being investigated, up till now the only generally accepted treatment strategy is to avoid the implicated food (3). Thus, the parents of an allergic child should feed their children safely while they are trying to prevent exposure to the offending food. Also, they ought to be ready to help their child in case of an anaphylactic reaction.

Avoidance of the implicated food includes preventing cross contact, reading product labels, taking measures for eating out and informing other caretakers. In addition, parents should supply the nutrients that are deficient because of the exclusion diet. These occupations bring a heavy burden to both family life and school life (2).

Twenty percent of anaphylactic reactions due to FA appear at school (4). Prevention of exposure to the offending food and providing the emergency treatment of a possible anaphylactic reaction during school life is a source of anxiety for parents. Parents also may be anxious about the school success and future of their children.

Previous studies, especially development of disease specific QoL measure instruments helped us understanding some aspects of the problem (5); however, there is still need for more in-depth knowledge for social interventions and family support. In this study, it's aimed to identify these problems in order to help developing measures for improving QoL of parents of children with FA.

MATERIAL and METHODS

This prospective multicenter study was conducted in the pediatric allergy department of University of Health Sciences, Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital, Karadeniz Technical University and Gaziantep University in Turkey between May 2015 and January 2016.

The study was approved by the ethic committee of our hospital. Parents received written information, and gave consent indicating that participation in the study was voluntary.

Study participants

Study participants were included parents of children and adolescents 18 years and younger who had food induced anaphylaxis. Information was obtained from parents and patient records including age of parents and children, gender of the child, education level of parents, medical characteristics of children (including the implicated food, age at diagnosis of FA, time since last anaphylaxis, other foods causing a reaction and comorbid diseases). A standard questionnaire evaluating problems parents face while dealing with FA was applied to parents by a pediatric allergist face to face.

Questionnaire

The questionnaire was produced using previously used health QoL indexes and adding personal experiences. The questionnaire was composed of a total of 40 items evaluating six subjects:

- 7 questions regarding social and family life

- 12 questions about school life

- 8 questions related to children's eating out and outside activities without family members

- 5 questions concerning emotions

- 4 questions about friend relations

- 4 questions regarding adrenaline auto-injector (AAI) use

Answers to questions were based on multiple-choice questions. Questions were answered with a 5-point Likert scale, some ranging from "absolutely agree, agree, no idea, disagree" to "absolutely disagree" and some items as "always, often, sometimes, rarely, never". These questions were rated from 0 to 5, and as 5 indicating the most intense site of the problem.

Scores gathered from questions grouped according to subjects are recorded and a section score was calculated by dividing the sum of question scores to number of answered questions. The mean of these scores were taken as a cut-off value and parents who had a score over the cut-off value were labeled as "has problem with this subject". If two or more questions were

not answered in a group, a group score were not calculated. For children under 5 years old, school problems score and friendship groups score were not calculated.

There were also eight questions that were answered as "yes" or "no" dealing with problems about school life and adrenaline use. Results of these questions were given as percentages of "yes" or "no".

At the end of the questionnaire, it was provided an open-ended question for comments of patients: "other than the problems cited in the questionnaire, is there any problem or suggestion you want to declare?"

Scores of questions and scores of sections were compared between groups of children according to gender, age groups, education of parents, type of the food causing anaphylaxis (milk or other, nuts or other, one food or more than one food), presence of comorbid allergic diseases, time from diagnosis, time from last anaphylaxis as 1 year or more). Questions and question groups were also compared according to the frequency of parents that "has problem with this subject" which is determined according to the mean of the score taken as cut-off.

Mother education was labeled as "low education" if she had lower than high school level.

Statistical Analysis

Statistical analyses were performed using SPSS 23.0 (IBM Corporation, Armonk, New York, United States). Descriptive statistics were expressed as mean ± standard deviation or median (minimum-maximum) for continuous variables, and as case numbers and percent (%) for nominal variables. The Shapiro-Wilk test was used to investigate whether the distribution of continuously measured variables was close to normal. Chi-square test was performed to compare the nonparametric data, Mann-Whitney test was used for non-normally distributed data and independent t-test was used for normally distributed continuous data. The results were considered statistically significant when p was <0.05.

RESULTS

Study population: Parents of 70 patients were included in the study. The demographic characteristics of the study group were given in Table I. According to cut-off value, 50% of parents had problems about family life, 51.4% had problems about eating out and outside activities without their family members, 50% were affected by emotional problems, 52.9% had problems about school life, 40% had problems about AAI use and 54.3% had problems about friend relations (Table II). Detailed information about problems within these subscales is given in Table III.

Effect of maternal occupation: We have divided patients into two groups according to maternal occupation as "occupied" and "housewife". Total score, and scores for family life and social problems, problems about outside activities, about school life, about friend relations and about AAI use were higher when mother was occupied (p<0.05) (Table IV). When mother is occupied, score for "I am overprotecting my child" was higher (p=0.045).

Effect of mother's education: When mother had lower education, total score, problems about outside activities section score and emotional problems section score was higher (p<0.05) (Table IV). These parents more frequently reported that they over protected their children (p=0.041).

Effect of time since last reaction: We have divided patients into two groups according to time since last reaction as "last reaction within one year" and "time since last reaction longer than one year". Parents of children who had a reaction longer than one year ago, more frequently report that their social life was affected by FA (p=0.048). Not taking AAI with them is more frequent if the child had a reaction within one year (p=0.023). Other section scores and scores for other questions were not different statistically.

Effect of time since diagnosis: We have divided patients into two groups according to time since diagnosis as "one year or less" and "more than one year". Scores of "my social life was effected from FA" and "I am anxious about the occurrence of anaphylaxis at school" questions were higher when time since diagnosis was more than one year (p=0.045 and p=0.014 respectively). Score of "AAI use problems section" was higher when time since diagnosis was one year or less (p=0.007). Other section scores and scores for other questions were not different statistically.

Effect of Type of Food Allergy

Effect of cow's milk allergy (CMA): Of the patients, 42.9% had CMA. Score for family and social life section and emotional problems section were higher among parents with a child with CMA allergy (p<0.05) (Table IV).

Effect of single or multiple food allergies: There was not a significant difference for scores of any sections or any questions between children who has and does not have more than one FA. Near to significance, score of "I am anxious about my child's FA" question was higher for parents of children who had multiple food allergies (p=0.058).

Effect of comorbid allergic diseases: Effect of accompanying asthma: Social and family life problems score was higher when children had accompanying asthma (p=0.034). These parents were more often anxious about occurrence of anaphylaxis at school and more frequently reported that their children could not attend activities in school (p=0.002 and p=0.047 respectively). Also parents of asthmatic children more frequently restricted outside activities such as picnics (p=0.006).

Effect of accompanying allergic rhinitis: When there was accompanying allergic rhinitis, total score was significantly

Table I. The demographic characteristics of the study group.

Characteristics of patients	n (%)
Age (month)	
Median (min-max)	48.5 (4-192)
Gender	
Girl	26 (37.1)
Educational status	
Preschool	47 (67.1)
Primary school	15 (21.4)
Middle School	5 (7.2)
High school	3 (4.3)
Distribution of allergen-causing foods	
Cow's milk	30 (42.9)
Egg	26 (37.1)
Nuts	18 (25.7)
Legumes	11 (15.7)
Fish	9 (18.9)
Sesame	3 (4.3)
Fruits	3 (4.3)
Honey	2 (2.9)
Red meat	1 (1.4)
Chicken meat	1 (1.4)
The number of allergic foods	
Single food	54 (77.1)
Multiple food	16 (22.9)
Allergy duration (month)	
Median (min-max)	30.0 (2-156)
Elapsed time since last serious reaction (month)	
Median (min-max)	6 (1-116)
Accompanying other allergic diseases	
Asthma	31 (44.3)
Allergic rhinitis	24 (34.3)
Atopic dermatitis	18 (25.7)
Parent who completes the survey	
Mother	62 (88.6)
Father	8 (11.4)
Mother's age (year)	
Median (min-max)	34 (21-48)
Mother's education	
High school and above	36 (51.4)
Mother's occupation	
Housewife	32 (45.7)
Occupied	38 (54.3)

Table II. Problems according to cut-off value.

	Score Median (min-max)	Having problem according to cut-off value n (%)
Social and family life problems	2.15 (0.9-3.8)	35 (50)
Problems about outside activities	2.72 (1.4-3.82)	36 (51.4)
Emotional problems	3.21 (1.71-4.6)	35 (50)
Problems about school life	2.11 (0-5)	37 (52.9)
Problems about friend relations	2.16 (0-4)	38 (54.3)
Problems about AAI use	2.5 (1-4)	40 (57.1)
Total score	2.62 (1.78-3.86)	35 (50)

AAI: *Adrenalin-auto-injector*

Table III. Detailed information about children.

	%
Problems about social and family Life	
Parents with problems about family life	50.0
My business life has been effected	38.5
My social life has been effected	54.3
Our time of shopping and economic expenditure has been effected	30.0
We cannot keep some food at home.	81.2
I have problems with their spouse due to food allergy	22.0
My spouse helps me dealing with food allergy	74.0
Problems about children's eating out and outside activities without family members	
Having problems about eating out and outside activities	51.4
I am anxious when my child go for outside activities	72.9
I do not let my child go outside activities.	77.0
Food allergy effects our selection of the place to eat out	40.0
I think that personnel working in food serving places do not have adequate information about food allergy	70.0
I inform the personnel about my child's allergy	84.0
I think that the personnel is not concerned about food allergy	26.0
We do not take AAI when eating out/going outside activities	33.3
Emotions	
Having emotional problems	50.0
I am worried about my child's food allergy	80.0
I feel hopeless and sad because of food allergy	60.0
I think that my child's future can be affected by food allergies	24.6
I overprotect my child due to food allergy	75.7
School life	
Having problems with their children' about school life	52.9
I am anxious thinking that anaphylaxis may occur during school time	80.0
I think that measures taken for food allergy at school are not enough	46.5
I do not believe that teachers can help during anaphylaxis	32.6
I think that school success may be affected by food allergy	40.0
I think that my child restricts his/her behavior at school because of food allergy	50.0
My child cannot attend activities at school because of food allergy	43.6
My child does not take AAI when going to school	75.9
My child's allergic situation was not questioned while school registration	43.8
I gave information about my child's food allergy while school registration	90.0
I gave information to the school personnel about AAI use	68.0
School did not want to register my child because of food allergy	12.9
Friend relations	
Having problems with friend relations	54.3
Friends of my child wants to help for food allergy	42.0
I do not believe they can help during anaphylaxis	70.0
My child is alienated by his/her friends	10.0
AAI use	
Having problems about AAI use	40.0
I know how to use AAI	70.0
I am afraid to use AAI	40.0
Web had problems providing AAI	72.0

AAI: *Adrenalin-auto-injector*

higher (p=0.045) and problems about school life score was higher near to significance (p=0.057). These parents were more often anxious about occurrence of anaphylaxis at school (p=0.025).

Effect of accompanying atopic dermatitis: Of the patients, 25.7% had atopic dermatitis. Scores of question or sections were not different for patients with and without atopic dermatitis

Open ended question: Question was "other than the problems cited in the questionnaire, is there any problem or suggestion you want to declare?" Of the parents, 19.7% reported that they were anxious because their child can be exposed to the offending food anytime, especially when their child is not with them and 11% tell "what if I cannot save my child". One third of parents told that they were sad that their child could not eat that food. Six percent of parents complained that there are not

Table IV. Factors affecting the problems parents have with food allergy.

Effect of mother's education	**High school/higher education median (min-max)**	**Lower education median (min-max)**	**p**
Problems about outside activities	2.54 (1.4-3.82)	3.0 (1.45-3.82)	0.034
Emotional problems	2.85 (1.71-4-.14)	3.42 (2.14-4.6)	0.008
Total score	2.56 (1.78-3.52)	2.78 (1.78-3.86)	0.023
Effect of mother's occupation	**Occupied median (min-max)**	**Housewife median (min-max)**	**p**
Social and family life problems	2.25 (0.9-3.8)	1.95 (1.3-3.3)	0.005
Problems about outside activities	2.88 (1.8-3.82)	2.54 (1.4-3.82)	0.017
Problems about school life	2.61 (0-5)	1.47 (0-4)	0.008
Problems about friend relations	2.33 (0-4)	1.66 (0-3)	0.001
Problems about AAI use	2.5 (1.25-4)	2.12 (1-4)	0.038
Total score	2.78 (2.05-3.86)	2.51 (1.78-3.27)	0.001
Effect of accompanying asthma	**Asthma (-) median (min-max)**	**Asthma (+) median (min-max)**	**p**
Social and family life problems	2 (0.9-3.4)	2.3 (1.3-3.8)	0.034
Effect of accompanying allergic rhinitis	**Allergic rhinitis (-) median (min -max)**	**Allergic rhinitis (+) median (min-max)**	**p**
Problems about school life	1.88 (0-5)	2.61 (0-4)	0.057
Total score	2.56 (1.78 -3.86)	2.8 (2.23-3.33)	0.045
Effect of accompanying atopic dermatitis	**Atopic dermatitis (-) median (min -max)**	**Atopic dermatitis (+) median (min -max)**	**p**
Problems about school life	2.32 (0-5)	0 (0-3.44)	0.008
Problems about friend relations	2.16 (0-4)	1 (0-2.67)	0.004
Effect of food type	**Cow's milk allergy median (min-max)**	**Other food allergy median (min-max)**	**p**
Social and family life problems	2.4 (1.3-3.8)	2.05 (0.9-3.22)	0.029
Emotional problems	3.42 (2-4.6)	3.14 (1.71-4.14)	0.025
Effect of time since diagnosis	**≤1 year median (min-max)**	**>1 year median (min-max)**	**p**
Problems about AAI use	2.75 (2-4)	2.5 (1-4)	0.007
Effect of gender	**Boy median (min-max)**	**Girl median (min-max)**	**p**
Emotional problems	3.0 (1.71-5.57)	3.42 (2-4.6)	0.012

AAI: Adrenalin-auto-injector

special foods that could take place of the food-causing allergy and 1.9% complains that there is not a cure. Another 1.9% told that they were sad because their children were dependent to other people.

DISCUSSION

When dealing with a chronic disease such as FA which effects each and every day of the lives of patients and their families at a daily basis, healthcare professionals must be aware of the problems they are facing, in order to improve management. Unfortunately, research suggests that health professionals are quite underprepared to address the needs of parents who have children with severe food allergies due to lack of knowledge (6). By using health related QoL questionnaires and by development of QoL questionnaires concentrating on parental conditions of food allergic children, studies have revealed some important aspects of the problem (2). We wanted to shed light on the subject by using a face-to-face and detailed questionnaire applied to parents of children who had experienced anaphylaxis due to FA.

One of the reported effects of FA is an impact on the social life of family members. Primeau et al.(7) revealed that parents of food allergic children had more impairment in family social life than parents of children with rheumatologic diseases. Family activities and social relations were reported to be limited by FA in previous studies (2,8,9). Accordingly, half of our parents were

found to have problems in family and social life section.

Families must take FA into account while shopping, while preparing food, when eating out or attending activities outside home. Also FA is reported to affect time for meal preparation (5, 9, 10). Firstly approximately one third of our parents reported that time for shopping and economic expenditure of their family were affected; most of them reported that they could not keep some food at home. Secondly half of our parents reported that FA effected their social life; some attended outside activities without their children and half of them did not attend outside activities at all. Forty percent reported that their career plans/ business life was affected by FA. Thus, parents must be supported while implementing measures taken for preventing FA into their life in order to decrease the effects of problems on social and family life.

A continuous stress in family life may interfere with family relations. Of our parents, 22% claimed that they had problems with their spouse because of FA, in the contrary and fortunately, 74% reported that their spouse helped them dealing with the problem. It was previously exclaimed that although medical conditions can be a strain, this might also strengthen family cohesion (2, 11). We can experience improved family cohesion but we must also be prepared for the one fifth of parents facing troubles in family relations.

Eating out is another major problem. In our study, sixty percent of parents report that FA affects the selection of the place to eat out. Seventy percent think that personnel working in food serving places do not have adequate information. Most parents claim that they inform the personnel but 26% report that they are not concerned. Education of personnel working in food serving places may help improving QoL of parents and may decrease allergic reactions.

Living with a child with FA may cause emotional problems (3, 12-16). Bollinger (9) reported that 41% of parents of food allergic children had increased stress levels and Broome-Stone (6) revealed that stress predicted quality of life. Fear, anxiety and sadness were also reported (2, 3, 12). According to our results, 50% of parents were affected for emotional problems. Most of the parents (80%) were anxious for their child's FA and 60% felt desperate and sad.

Appropriate levels of anxiety may be useful for better managing to deal with skills but high levels may be hazardous (17). Fedele et al. described four response patterns in 57 FA families: balanced psychosocial functioning with high management skills and adequate vigilance (41%), high responders with adequate management skills and high anxiety (45%), low responders with both low management skills and low vigilance (5%), and anxious high responders with high management skills and extremely high maternal anxiety (9%) (18). One role of the healthcare provider in FA management is to help patients and families find the difficult balance between adequate vigilance and excessive anxiety.

One of the most important worrying part of life of families of food allergic children is school time where children are away from parent control. Anaphylaxis due to FA occurs during school time in 20% of cases and FA is an important cause of school absenteeism (4,19). Gillespie et al.(12) reported that parents had difficulty to completely relax when their children are at school. More than 30% of parents frequently go to school for concerns about their child's FA and 10% use home-school for their children (3,9). In our study, half of parents reported problems about school life. Most of them were anxious thinking that anaphylaxis could occur during school time and 40% thought that school success may be affected. Half of the parents thought that their children restricted their behavior because of FA and 43.6% report that their children could not attend activities at school.

In our study, nearly half of parents thought that measures taken for FA at school were not enough and one third did not believe that teachers could help during anaphylaxis. Of the parents 43.8% reported that their allergic situation was not questioned while school registration and 12.9% reported that school did not want to register their children because of FA. In a study young adults claimed that wider selections of safe meal options, allergen-safe cafeteria areas, selected members of stuff to discuss meals with and education of other students would improve their coping with FA (20). Increasing awareness about FA and education of both school personnel and students is necessary for decreasing reactions at school and for improving QoL of parents and children with FA.

Food allergic children are reported to be prone to teasing and harassment, being disregarded, facing unreliability and lack of understanding and this may interfere with their friend relations (21,22). In our study group, approximately 10% of parents reported that their children were alienated by their friends and their children had difficulty in having new friends. Although parents reported that friends of their children wanted to help for FA, most of them did not believe they could help during anaphylaxis. Supporting children when they have such problems and informing school children about FA may help to construct a more supportive environment for food allergic children.

Previous studies showed that anxious parents who are worried about their child's medical health are at increased risk of demonstrating over involved parenting behaviors that may interfere with child's development of autonomy and social skills (23). It is also revealed that overprotection can extend beyond childhood and effect young adults (24). Bollinger et al reported that parents of food allergic children restrict their child's activities in order to avoid accidental exposures (9). Most parents are reported to have concerns about the implications their protectiveness can have for their children (25). Accordantly in our study most of parents claimed that they overprotect their children. Health care providers must be aware of the problem and help parents achieving a balanced behavior in order to

protect their children but also letting them developing autonomy and social skills.

Although parents are anxious about their children's FA, carrying and using AAI is not adequately performed. Nearly 60% of the parents had problems about AAI use in our study group. Although seventy percent reported that they knew how to use AAI, 40% claimed that they were afraid to use it. One third of parents claim that they did not take AAI when eating out/going outside activities. In accordance with the results of Watura et al. (26), most of our parents reported that their children did not take their AAI with them when going to school. Education about AAI use must be a substantial part of each and every follow up visit for patients with FA.

Type of food causing anaphylaxis may affect the impact of FA on family. Peanut is likely to cause severe reactions whilst others such as milk are difficult to avoid for young children. Bollinger et al. (9) did not find a difference in QoL according to food type whereas Springston et al. (10) reported that egg, milk and wheat allergy had a worse effect on families. Accordingly, in our study group, score for social and family life section and score for emotional section was higher among parents with a child with CMA allergy. Thus, parents of children with CMA should be more carefully screened and supported for problems. Having more than one FA is reported to lower QoL in previous studies but we could not reveal a significant difference between groups with one or more than one FA (9,10,25).

Co-existent asthma is reported to be a risk for fatal allergic reactions, severe allergic rhinitis is a risk for severe pharyngeal edema and severe atopic dermatitis is a risk for unconsciousness during a food allergic reaction (27). Marklund et al reported that number of co-existent allergic disease was related to health related QoL (22). An effect of asthma and atopic dermatitis were reported (13,28,29). In our study group, parents of children with co-existent asthma and/or allergic rhinitis were more frequently anxious about occurrence of anaphylaxis at school and they more frequently restricted their children's outside activities. Parents with children with more than one chronic condition are prone to more problems and they must be supported for each disease.

Maternal education and occupation also seems to have impact of FA on family life. According to our results, when mother had lower education, emotional problems section was more often problematic. Occupied mothers had more problems in nearly all variable and they were overprotective more frequently. Thus, occupied mothers and mothers with lower education should be better supported.

Time since last reaction may affect the impact of FA on family. Springston et al reported that parents were more frequently effected from FA if they had an emergency visit within one year (10). In the contrary, in our study, parents of children who had a reaction longer than one year ago, more frequently report that their social life is effected and that they are more frequently anxious about the possibility of anaphylaxis during school time. Surprisingly, not taking AAI with them is more frequent if the child had a reaction within one year (p=0.023). Time since diagnosis also seems to have a role. When time since diagnosis was more than one year, parents report more negative impact on social life and more anxiety about FA. In the contrary, score of "AAI use problems section" was higher when time since diagnosis was one year or less. These parents are less confident with their use of AAI. Parents who are diagnosed within one year or who had a reaction within one year may need more intense information and support about AAI use.

Previous reports revealed that when parents do not have adequate information about the disease, their stress and anxiety levels are increased (16,25,30). Mandell et al.(25) reported that parents felt alone and unsupported . Vargas et al.(30) reported reduced stress and anxiety if parents were provided access to accurate and easy to understand information. Thus, it is important to supply understandable materials and sources about FA for parents.

Parents of food allergic children need support for coping with the disease. Especially, parents of children with CMA, occupied mothers and mothers with lower education seem to need special concern. Parents must be informed about AAI in every visit. Health care workers must be aware of the problems of parents and be prepared to help them in this compelling process.

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