Research Article / Araştırma Makalesi

Evaluation Anxiety Levels of Adult Patients and Parents of Adolescent Patients With Anaphylaxis

Anafilaksili Erişkin Hastaların ve Ergen Hastaların Ebeveynlerinin Kaygı Düzeylerinin Değerlendirilmesi

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Abstract

Background: Anaphylaxis is a sudden onset condition that may progress with severe systemic symptoms and may be accompanied by life-threatening respiratory failure and cardiovascular shock. Exposure to a traumatic event may cause patients and their parents to fear reliving the same event, so they try to avoid risk factors. It was aimed to determine the anxiety and stress levels in adult patients and in parents of adolescent patients diagnosed with anaphylaxis and to compare them with healthy controls.
Materials and Methods: A questionnaire-type study was conducted. Control group (group 1), adult patients diagnosed with anaphylaxis (group 2), and parents (a mother or father) of adolescent diagnosed with anaphylaxis (group 3) were included in the study. The anxiety levels of participants were evaluated by State-Trait Anxiety Inventory (STAI).
Results: A total of 163 participants were included in the study. Seventy-one participants were in the control group, forty-four were in group 2, thirty-eight were in group 3. STAI-T and STAI-S scores of groups 2 and 3 were significantly higher than controls. No difference was found between groups 2 and 3 for STAI-T scores (p=0.8) and STAI-S scores (p=0.74).
Conclusions: Adult patients diagnosed with anaphylaxis and parents of adolescents are more anxious than the normal healthy population. Anxiety and anaphylactic conditions are often comorbid. Psychosocial assessment should be the first step in adult patients with anaphylaxis and their parents. Physicians should prevent the harm that anxiety may cause. For this purpose, education programs, screening programs, support trainings with patient participation should be organized.

Key Words: Anaphylaxis, anxiety, adults, parents.

Öz

Amaç: Anafilaksi, ciddi sistemik semptomlarla seyredebilen ve yaşamı tehdit eden solunum yetmezliği ve kardiyovasküler şokun eşlik edebileceği ani başlangıçlı bir durumdur. Travmatik bir olaya maruz kalma, hastaların ve ebeveynlerin aynı olayı tekrar yaşamaktan korkmasına neden olabilir, bu nedenle risk faktörlerinden kaçınmaya çalışırlar. Erişkin hastalarda ve anafilaksi tanısı konan genç erişkin (ergen) hastaların ebeveynlerinde anksiyete ve stres düzeylerinin belirlenmesi ve sağlıklı kontrollerle karşılaştırılması amaçlandı.
Materyal ve metod: Anket tipi bir çalışma yapılmıştır. Kontrol grubu (grup 1), anafilaksi tanısı almış erişkin hastalar (grup 2) ve anafilaksi tanısı almış ergenlerin (grup 3) ebeveynleri (anne veya baba) çalışmaya dahil edildi. Katılımcıların kaygı düzeyleri Durumluk-Sürekli Kaygı Envanteri (STAI) ile değerlendirildi.
Bulgular: Çalışmaya toplam 163 katılımcı dahil edildi. Yetmiş bir katılımcı kontrol grubunda, kırk dördü grup 2'de, otuz sekizi grup 3'te idi. Grup 2 ve grup 3 STAI-T ve STAI-S puanları kontrollerden anlamlı olarak yüksekti. STAI-T skorları (p=0.8) ve STAI-S skorları (p=0.74) açısından 2. ve 3. gruplar arasında fark bulunmadı. Gruplar arasındaki STAI-S ve STAI-T puanlarındaki fark, bağımsız faktörlerden etkilenmedi.
Sonuç: Anafilaksi teşhisi konan yetişkin hastalar ve genç erişkinlerin ebeveynleri normal sağlıklı popülasyondan daha endişelidir. Anksiyete ve anafilaktik durumlar sıklıkla eşlik etmektedir. Anafilaksili erişkin hastalarda ve ebeveynlerinde psikososyal değerlendirme ilk adım olmalıdır. Hekimler anksiyetenin yol açabileceği zararları önlemelidir. Bu amaçla eğitim programları, tarama programları, hasta katılımlı destek eğitimleri düzenlenmelidir.

Anahtar Kelimeler: Anafilaksi, kaygı, yetişkinler, ebeveynler.

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Received / Geliş tarihi: 27.05.2022

Accepted / Kabul tarihi: 12.09.2022

DOI: 10.35440/hutfd.1122524

This study was previously presented as an oral presentation at the 28th National Allergy and Clinical Immunology Congress, Ocotber 13-17, 2021, Türkiye.

Introduction

Anaphylaxis is a sudden onset condition that may progress with severe systemic symptoms and may be accompanied by life-threatening respiratory failure and cardiovascular shock (1,2). The cause, pathophysiology, and severity of anaphylaxis may vary in patients. A lot of mediators such as histamine, tryptase, prostaglandin can be secreted during anaphylaxis periods and it may cause reactions ranging from the mildest (urticaria and angioedema) to the most severe (dyspnea, loss of consciousness, and shock) (3). Many people with a history of anaphylaxis may experience emotional stress afterwards (4). Exposure to a traumatic event may cause in patients and parents to fear reliving the same event, so they try to avoid risk factors (5). It was shown that post-traumatic disorders and psychosocial disorders may be seen after anaphylactic shock in adults (4).

Families often support their children to reduce children's anxiety due to anaphylaxis. In some cases, parents may do unnecessary nutritional restrictions in children with anaphylaxis because of concerns for food contamination (6). This situation may cause overprotection by families for their children and lead to anxiety disorders in the parents. It was also shown that parents of children with multiple food allergies or anaphylaxis were more anxious (7,8). It is essential to support the family in this regard for the child to cope with anaphylaxis as a capable, competent individual (6). While it is easy to evaluate the effect of anxiety in parents in children on parents, it is difficult in adults. There are few studies on this subject (4). Because most adults do not live with their parents.

In addition to the possibility of recurrent anaphylaxis throughout life, the obligation to carry adrenaline autoinjectors may cause additional stress and anxiety in individuals with a history of anaphylaxis and their parents (6,8). Anxiety may be persistent, may harm the quality of life so necessary measures should be taken by detecting anxiety in adult patients and their family in a timely manner. When the literature on this situation in adults was reviewed, it was observed that there have been limited studies. Our aim was to determine the anxiety levels of the adult patients and parents of adolescent patients with a history of anaphylaxis. It was also planned to compare this anxiety levels with healthy controls.

Materials and Methods

Study design: A questionnaire-type study was conducted. Adult patients diagnosed with anaphylaxis, parents (a mother or father) of young adult (adolescent) patients diagnosed with anaphylaxis and a healthy adult control group without any additional chronic diseases were included in the study. Patients who had been followed up and who had been trained on the use of adrenaline auto-injectors before were included in the study. The sociodemographic characteristics of the patients were recorded. The informed and written consent were obtained from all participants. Ethical approval of the study was obtained from the local ethics committee (Mustafa Kemal University Ethics Committee, date and number: 2019/117). The participants who couldn't speak Turkish and read, who have any physical or medical problems for completing the questionnaire and assessment instruments were excluded from the study for a healthy and objective study.

Assessment Instruments

The anxiety of participants was evaluated by State-Trait Anxiety Inventory (STAI). STAI has been translated into Turkish and its effectiveness and reliability have been proven (9). STAI includes two parts, the first part is the state anxiety scale (STAI-S) (one point in time) and the other part is the trait anxiety scale (STAI-T) (a general tendency to becoming anxious). Total trait and state anxiety scores vary between a minimum of 20 and a maximum of 80 points. Higher scores indicate higher anxiety levels. The internal consistency for both parts is high, with Cronbach's alpha >0.90 and >0.89, respectively (10).

Statistical methods

The SPSS version 18 software was used for statistical analyses. Whether the variables conform to the normal distribution or not was evaluated with visual (histogram and probability graphs) and analytical (Kolmogorov Smirnov /Shapiro-Wilk tests) methods. Descriptive statistics were shown with the median for numerical (continuous) non-normally distributed variables and the mean for normally distributed variables. Categorical variables were expressed as ratios. A one-way ANOVA test was used for comparing STAI-S and STAI-T points between groups. Levene test was used to assess the homogeneity of the variances. In addition, univariate analysis and covariance analysis were used to evaluate the effects of independent factors on STAI-S and STAI-T values between groups. When an overall significance was observed, pairwise posthoc tests were performed using Tukey's test. An overall p-value of less than 0.05 was considered to show a statistically significant result.

Results

A total of 163 participants were included in the study. Seventy-one participants were group 1 (control), 54 of them were group 2 (adult patients diagnosed with anaphylaxis), 38 were group 3 (parents of adolescents diagnosed with anaphylaxis). Drug allergy was the most common cause in groups. The sociodemographic characteristics of the participants are shown in Table 1. There was no difference between the groups in terms of gender and age.

The comparison of STAI-S and STAI-T scores between the groups are shown in Table 2. There was a significantly difference between three groups in terms of STAI-S ($p<0.001$) and STAI-T scores ($p=0.006$). When the Post-hoc testing revealed significant differences between groups, group 2 (Mean (M)=44.5, Standard Deviation (SD) =10) and group 3

(Mean=46.1, SD=10.2). STAI scores were significantly higher than control group (M=38.5, SD=10.2). Also, group 2 (M=47, SD=9.4) and group 3 (M=48.6, SD=8.4) STAI-T scores were significantly higher than the control group (M=43.2, SD=9).

Table 1. Sociodemographic characteristics of the groups

Parameters		**Group 1 Control Group**	**Group 2 Adult patients diagnosed with anaphylaxis**	**Group 3 Parents of adolescents diagnosed with anaphylaxis**	**p**
Gender	**Male n, (%)**	50 (70.5)	34 (63)	30 (78.9)	
	Female n, (%)	21 (29.5)	20 (37)	8 (21.1)	0.26*
Age (year), mean$\pm SD$		36.5$\pm$**9**	39$\pm$14	42 $\pm$**10**	0.18**

** Chi-square test was used. **One-way ANOVA test was used*

Table 2. STAI-S and STAI-T results of the groups

	Group 1 (Control) Mean±SD	**Group 2 (Adult patients diagnosed with anaphylaxis) Mean±SD**	**Group 3 (Parents of adolescents diagnosed with anaphylaxis) Mean±SD**	**P**
State anxiety scale (STAI-S)	38.5±10.2	44.5±10	46.1±10.2	p<0.001
Trait anxiety scale (STAI-T)	43.2±9	47±9.4	48.6±8.4	p=0.006

Table 3. Comparison of follow-up times in anaphylaxis patients *

	Adult patients diagnosed with anaphylaxis n=54	**Adolescents diagnosed with anaphylaxis) n=38**	**Statistics**	**P**
Follow up time (weeks), median (min-max)	28 (6-676)	30 (7-520) **	z=-0,44	0.65

**Mann-Whitney U test was used. ** Adolescents' follow-up period.*

Table 4. Relationship between participants' ages and STAI-S and STAI-T scores of anaphylaxis groups *

	Groups	**r**	**p****
STAI-S	2	0.008	0.95
STAI-T	2	0.077	0.58
STAI-S	3	-0.039	0.81
STAI-T	3	0.11	0.48

** In Group 3, the relationship between parents' ages and their anxiety was evaluated. **Pearson correlation test was used.*

Table.5 Relationship between follow-up time and STAI-S /STAI-T scores of anaphylaxis groups (group 2 and 3) *

	Groups	**r**	**p****
STAI-S	2	-0.156	0.25
STAI-T	2	-0.078	0.57
STAI-S	3	-0.013	0.93
STAI-T	3	0.18	0.27

** In Group 3, the relationship between adolescents' follow-up times and parental anxiety was evaluated. **Pearson correlation test was used.*

Table.6 Comparison of anxiety by gender in the groups diagnosed with anaphylaxis

		N	**Mean**	**Standard Deviation**	**P**
STAI-S	Male	64	42.8	8.7	<0.001
	Female	28	49.8	8.3	
STAI-T	Male	64	41.5	9.9	0.02
	Female	28	46.8	9.7	

Univariate analysis for the effect of independent factors on the difference between STAI-T and STAI-S scores in group 1 and anaphylaxis group (group 2 and 3 together) were evaluated. Ages (p=0.88), education levels (p=0.57), genders (p=058), occupations (p=0.121), incomes of family (p=0.85), places of residence (p=0.53), chronic diseases (p=0.86) did not have effects on difference between group 1 and anaphylaxis groups for STAI-T scores. Also, ages (p=0.56), education levels (p=0.74), genders (p=0.304), occupations (p=0.53), incomes of family (p=0.38), places of residence (p=0.1), chronic diseases (p=0.42) did not affect have effect on difference between group 1 and anaphylaxis group.

The follow-up durations of anaphylaxis patients are shown in Table 3. No statistically significant difference was found between patients in terms of follow-up durations.

The evaluation of the correlation the age of the participants and STAI-S and STAI-T scores in group 2 (adults) and 3 (parents of adolescents) are shown in table 4. There was no significant relationship between STAI-S and STAI-T values of adult patients diagnosed with anaphylaxis and parents of adolescents diagnosed with anaphylaxis and their ages.

No significant correlation was found between follow-up times of patients and STAI-S and STAI-T scores in group 2 and 3 (Table 5).

When the STAI-S and STAI-T values of anaphylaxis groups (group 2 and 3) were compared according to gender, a significance difference was found between groups for STAI -S (<0.001) and STAI-T (p=0.02) values. The mean STAI-S and STAI-T values in women was found to be statistically significantly higher than in men (Table 6).

Discussion

While food allergy is the main cause of anaphylaxis in children, bee-insect bites and drug allergy are slightly more common in adults (3,11). Lee et al. evaluated 203 adult patients with anaphylaxis, drugs were found to be the most common cause of anaphylaxis (4). The most common trigger was drug allergy (42%) in our study, which is consistent with literature data.

The number of studies evaluating the anxiety and stress of adults diagnosed with anaphylaxis and their parents is few in the literature. Most of the studies on this subject have been done in children. As most adults live independently from their parents, it was planned to evaluate the parents' anxiety of adolescent patients diagnosed with anaphylaxis in our study. It was shown that the incidence of post-traumatic stress disorder, anxiety and depression has been increased in adults with anaphylaxis in a multicentre clinical trial (4). Findeis et al. assessed ninety adult patients with insect sting allergies by telephone. It was determined that thirty-five of patients (38.9%) had only adrenaline auto-injector. Eleven patients (12.2%) were treated with venom immunotherapy, while 44 patients (48.9%) did not have adrenaline auto-injector or receive venom immunotherapy. The group with epinephrine auto-injector had higher anxiety and depression scores than the other groups (12). Cummings et al. evaluated the quality of life and anxiety in mothers with nut allergic children and adolescents between 6 and 16 years old by using the State-Trait Anxiety Inventory (STAI). Having an auto-injector has been shown to reduce mothers' anxiety, contrary to expectations. However, mothers' trait anxiety levels were found to be higher than the normal population (13). In a study conducted in 92 food allergic children aged 0-2 years, anaphylaxis was diagnosed in six patients (6.5%). No statistically significant difference was found for the state and trait STAI scores between mothers of children with or without anaphylaxis (14). It was shown that adult patients diagnosed with anaphylaxis experienced more psychological distress and stress (15). It has been determined that reading food labels, paying attention to allergic foods contamination, and carrying an adrenaline autoinjector may be perceived as social difficulties and stress by adolescents (12,16,17). In our study, STAI-T and STAI-S scores were found to be higher in adults diagnosed with anaphylaxis (group 2) and parents of adolescent patients diagnosed with anaphylaxis (group 3) when they were compared to control group. Our results show that adults with anaphylaxis and parents of adolescent patients diagnosed with anaphylaxis had higher stress scores than the control group. It was concluded that anaphylaxis may be an important stress factor for adults and parents of adolescent patients with anaphylaxis. The results of our study are compatible with the literature. Also, we prescribed an adrenaline auto-injector and gave training all patients diagnosed with anaphylaxis. Therefore, we could not evaluate the effect of auto-injector on anxiety.

No relationship was found between patients' follow-up time and participants' STAI-T and STAI-S scores in group 2 and 3. This shows that anaphylaxis may be an important stress factor in adults and parents of adolescent patients independent from the follow-up time.

In a study conducted on young adults with food allergies, a weak but statistically significant positive correlation was found between anxiety and age (18). Beken et al studied anxiety in mothers with food allergic children. No statistically significant relationship was found between maternal ages and mothers' trait and state STAI anxiety scores (14). In our study, no statistically significant relationship was found between participants' ages and their STAI-T and STAI-S scores. Adult patients diagnosed with anaphylaxis and parents of adolescent patients with anaphylaxis were found to have higher anxiety levels than normal healthy group regardless of age in our study. These results were similar to study that was conducted to children (14).

It was shown girls had a higher rate of anxiety and meta-worry than boys (19). Also, women were more anxious than men in adult patients followed up for bee venom allergy (12). Mothers generally take more responsibility for children's food allergies, and fathers contribute less than mothers (8,20). In our study, women's STAI-T and STAI-S scores were significantly higher than men in adults diagnosed with anaphylaxis. This result of our study is compatible with the literature information.

The limitations of our study; this study is a questionnaire type study and anxiety levels are measured for screening purposes. The patients were not evaluated with physical examination and history. Other factors that may affect anxiety in individuals with anaphylaxis, such as adrenaline auto-injector use, number of hospitalizations and emergency visits, and severity of anaphylaxis were not evaluated.

Conclusion

As seen in literature and this study, adult patients and parents of adolescent patients diagnosed with anaphylaxis are more anxious than the normal healthy population. Anxiety and anaphylactic conditions are often comorbid. Detecting psychosocial effect of anaphylaxis and making a comprehensive assessment for adult patients and parents of adolescent patients with anaphylaxis should be the first step. Physicians should prevent the damage of existing anxiety because it may damage the patients' and parents' quality of life and social life. For this purpose, education programs, screening programs, support training with patient participation should be organized.

Ethical Approval: *Ethical approval of the study was obtained from the local ethics committee (Mustafa Kemal University Ethics Committee, date and number: 2019/117).*

Author Contributions:

Concept: E.E.

Literature Review: E.E., A.K.

Design : E.E. , A.K.

Data acquisition: E.E. , A.K.

Analysis and interpretation: E.E.

Writing manuscript: E.E. , A.K.

Critical revision of manuscript: E.E. , A.K.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: Authors declared no financial support.

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