

DİŞ HEKİMLERİNİN ANAFİLAKSİ VE TEDAVİSİ HAKKINDAKİ DENEYİM VE BİLGİ DÜZEYLERİNİN DEĞERLENDİRİLMESİ, ANKET ÇALIŞMASI

EVALUATION OF THE EXPERIENCE AND KNOWLEDGE LEVELS OF DENTISTS ABOUT ANAPHYLAXIA AND TREATMENT SURVEY STUDY

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ÖZET

AMAÇ: Bu çalışma ile ani gelişen ve zaman zaman hayatı tehdit eden boyutlara da ulaşabilen, hızlı ve etkin müdahale gerektiren anafilaksi durumu hakkında diş hekimlerinin bilgi ve farkındalığının değerlendirilmesi amaçlanmıştır.

GEREÇ VE YÖNTEM: Çalışmaya katılmaya gönüllü olan diş hekimliği eğitimini Türkiye'de tamamlamış tüm diş hekimlerine 20 sorudan oluşan bir anket formu doldurtuldu. Bu anket formunda katılımcıların kimlik bilgilerine dair herhangi bilgi bulunmamaktadır. Anketteki 4 soru katılımcıların demografik özellikleri ile ilgili, 4 soru günlük klinik pratikleri ile ilgili iken geriye kalan 12 soru anafilaksi tanı ve tedavisi ilgili sorulardan oluşmaktadır. Çalışmada yer almaya kabul eden tüm katılımcılara anketler fiziken verilmiş ve anket tamamlandıktan sonra araştırmacılar tarafından toplanmıştır.

BULGULAR: Toplamda 228 diş hekimi ankete katılım gösterdi. 18-24 ve 25-32 yaş grubundakiler daha yüksek anafilakside ilk tercih edilen ilacın hangisi olduğu sorusuna "Epinefrin" cevabını verdiler ($p=0,001$). Anafilaksi tedavisinde epinefrinin hangi yol ile uygulanması gerektiği sorusuna 33 - 47 yaş grubundakilerin tamamı bilmiyorum cevabını verdi ($p=0,001$). "Diş hekimliği fakültesinden mezuniyet veya Uzmanlık eğitiminiz sonrasında anafilaksi tanı kriterleri ve tedavisi konusunda herhangi bir literatür, kitap bölümü veya rehber okudunuz mu?" sorusuna 33-47 yaş grubundakilerin tamamının "Okumadım, bilgimin yeterli olduğunu düşünüyorum" cevabını verdi ($p=0,0001$).

SONUÇ: Mezuniyetleri üzerinden daha kısa süre geçen diş hekimlerinin anafilaksi ve tedavisi hakkındaki bilgi ve farkındalık seviyesi diğer gruplara göre daha yüksektir.

ANAHTAR KELİMELER: Anafilaksi, Diş Hekimi, Anestezi.

ABSTRACT

OBJECTIVE: The aim of this study was to evaluate the knowledge and awareness of dentists about anaphylaxis, which develops suddenly and sometimes reaches life-threatening dimensions, and requires rapid and effective intervention.

MATERIAL AND METHODS: A questionnaire consisting of 20 questions was administered to all dentists who volunteered to participate in the study and completed their dental education in Türkiye. This questionnaire form did not contain any information about the identity of the participants. Four questions in the questionnaire were related to the demographic characteristics of the participants, four questions were related to their daily clinical practice, and the remaining 12 questions were related to the diagnosis and treatment of anaphylaxis. The questionnaires were physically given to all participants who agreed to take part in the study and were collected by the researchers after the questionnaire was completed.

RESULTS: A total of 228 dentists participated in the survey. 18-24 and 25-32 age groups were more likely to answer "Epinephrine" to the question "Which drug is the first drug of choice in anaphylaxis" ($p=0.001$). All participants in the 33-47 age group answered "I don't know" to the question "Which route should epinephrine be administered in the treatment of anaphylaxis" ($p=0.001$). To the question "Have you read any literature, book chapters or guidelines on the diagnostic criteria and treatment of anaphylaxis after graduation from dental school or after your specialty training?", all of those in the 33-47 age group answered "I have not, I think my knowledge is sufficient" ($p=0.0001$).

CONCLUSIONS: Dentists who graduated more recently had a higher level of knowledge and awareness about anaphylaxis and its treatment compared to other groups.

KEYWORDS: Anaphylaxis, Dentist, Anesthesia.

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INTRODUCTION

Anaphylaxis is defined as the most severe form of allergy, so it is very important to make a rapid diagnosis and start treatment (1,2). It is very difficult to make a diagnosis if the patient has no previous history of anaphylaxis in his/her medical history or if the patient presents clinically with atypical symptoms (3,4). The general incidence of anaphylaxis varies between 50-112 per 100.000 person-years, but the approximate incidence is considered to be 0.3-5.1% (5). The incidence of anaphylaxis has increased in recent years (6). The incidence of anaphylaxis in dental practice is lower than the general incidence and 0.004-0.015 cases/dentist/year. Although the overall mortality rate seems to be stable, the rate of drug-related fatal anaphylaxis is increasing (3).

Anaphylaxis in dental practice is generally due to antibiotics, latex, topical skin preparations, and anesthetic drugs (7,8). Local anesthetics are among the most commonly used drugs in dental practice. 6 million people worldwide are exposed to local anesthetics every day during dental procedures and the majority of them do not know whether they are allergic to these drugs (9). Allergic reactions caused by local anesthesia are caused either by the anesthetic itself or by the additives in the solution. The development of allergic reactions due to local anesthesia alone is extremely rare, less than 1% of all reported adverse reactions (10,11).

All dentists should be properly trained to deal with medical emergencies that may arise during dental practice. When an immune-mediated hypersensitive reaction, such as an anaphylactic reaction develops during dental practice, regardless of the cause, it can be life-threatening. It is thought that physicians worldwide are still performing critically inadequate interventions in the treatment of anaphylaxis (12). However, there are not many studies in the literature that demonstrate the level of knowledge and intervention skills of dentists in anaphylaxis.

With this questionnaire-based study, we aimed to evaluate the level of knowledge and experience of dentists about anaphylaxis and

the treatment to be applied in case of anaphylaxis and to make inferences about the applications that can be made in daily practice in the light of the data we will obtain.

MATERIALS AND METHODS

This study was designed as a prospective, single-center and questionnaire-based study. Dentists who are currently working in our hospital and have completed their dental education in Türkiye were informed about the study, and anyone who volunteered to participate in the study and signed the voluntary consent form was included in the study. The exclusion criteria were not having completed their dental education or having completed their education in a country other than Turkey.

The questionnaire forms to be filled out by the participants were created by a team consisting of an anesthesiologist, a dental specialist and a dental student who have experience in the subject. This questionnaire was evaluated and approved by 3 anesthesiologists working outside the center where the study was conducted and who have experience in anaphylaxis treatment. During the creation of the questionnaire, the questionnaire study used in the study conducted by Krishnamurthy (13) and colleagues was also taken as a reference. The questionnaire forms were physically given to all volunteers participating in the study and collected from the volunteers by the researchers after they were filled out. There is no section in the questionnaire that questions the identity information of the participants. There are 20 questions in total in the questionnaire. Four of them are questions describing the demographic characteristics of the participants, four of them are questions about daily dental practice and the remaining 12 questions are related to anaphylaxis knowledge level and intervention ability.

The questionnaire form filled out by the participants is shown in **Figure 1**. After the questionnaire forms collected from the participants the answers were categorized and transferred to electronic media. All data were statistically evaluated after categorization.

1. Age of dentist ?
 - 18-24
 - 25-32
 - 33-40
 - 41-47
 - >47
2. Gender :
 - Female
 - Male
3. Duration of dental practice(year) :
 - <5
 - 5-10
 - 11-15
 - 16-20
 - >20
4. What's your position ?
 - General Dentist
 - Specialist Dentist
 - Lecturer(Asc. Prof., Prof. Etc.)
5. Which of the following local anesthetics do you mostly use in your daily routine?
 - Lidocaine
 - Articaine
 - Prilocaine
 - Others
6. Do you prefer local anesthesia with adrenaline or without adrenaline?
 - With Adrenaline
 - Without Adrenaline
7. Do you ask your patients if they have any drug allergies before treatment procedures?
 - Yes
 - No
8. Do you apply local anesthetic test dose to your patients?
 - Yes
 - No
9. How many times have you encountered anaphylaxis before?
 - 1-2 times
 - 3-5 times
 - 5-10 times
 - >10 times
 - Never
10. Have you ever had hesitations about the treatment of an anaphylaxis case?
 - Yes
 - No
11. Do you have a treatment plan for anaphylaxis in your clinic?
 - Yes
 - No
12. Which emergency medicine do you keep in your clinic?
 - Dopamine
 - Epinephrine
 - Corticosteroid
 - Antihistamine
 - Salbutamol
 - Glucagon
13. How many of the anaphylaxis cases you encountered resulted in death?
 - 0
 - 1
 - 2
 - 3
 - >3
14. Do you know basic life support and its stages?
 - Yes
 - No
15. Which of the following symptoms and findings do you think are associated with anaphylaxis?
(You can tick more than one option)
 - Nausea - Vomiting
 - Respiratory distress
 - Cough
 - Itching in palms
 - Urticaria-Angioedema
 - Hypotension
 - Anxiety-Fear of Death
 - Loss of Consciousness
 - Itchy throat
 - Cramping abdominal pain
16. Which is your first choice for the treatment of anaphylaxis?
 - Dopamine
 - Epinephrine
 - Corticosteroid
 - Antihistamine
 - Salbutamol
 - Glucagon
17. In your opinion, which drug should be administered first in the treatment of anaphylaxis?
 - Intravenous
 - Subcutaneous
 - Intramuscular
 - I don't know
18. How do you act when you see a patient who is not allergic to drugs but has other allergic diseases such as asthma?
 - I perform the treatment ignoring allergic problems.
 - I accept these problems as risk factors and consult the patient
19. Have you read any literature, book chapters or guidelines on the diagnostic criteria and treatment of anaphylaxis after graduation from the faculty of dentistry or your specialist training?
(can be printed source or from the internet)
 - I haven't read it, I don't think it's related to my profession.
 - I haven't read it, I think my knowledge is sufficient
 - I felt the need to read it when I encountered such a patient.
 - I haven't read it, I would prefer a treatment scheme that is easy to understand and apply that I can refer to in case of emergency.
20. Which one would you choose for a patient in whom you suspect anaphylaxis?
 - I do not start treatment
 - I do a skin test myself with the suspected drug
 - I consult the patient with the suspected drug to an allergist for testing
 - I treat patients without local anesthetic

Figure 1: Survey form questioning the level of knowledge of dentists about anaphylaxis and anaphylaxis treatment.

Ethical Committee

Data collection for the study was started after the ethics committee permission of our university. Ankara University Faculty of Dentistry Clinical Research Ethics Committee 38/2024.

Statistical Analysis

The data obtained in this study were analyzed using SPSS 22 package program. In addition to the percentage distribution of the data, the relationship/difference between the answers given to the questions was analyzed by Chi-Square analysis. In case of insufficient number of responses per cells/eyes in the tables, Fisher's Exact test and/or Chi-Square analysis with the help of Montecarlo simulation technique were used. 0.05 was used as the significance level and if $p < 0.05$, it was stated that there was a significant relationship/difference.

RESULTS

A total of 228 dentists participated in the study. When we look at the distribution of the participants according to age groups, 103 (45.2%) of them are in the 18-24 age group, 113 (49.6%) in the 25-32 age group, six (2.6%) in the 33-40 age group and six (2.6%) in the age group over 47 years. When the answers of the participants to the third question in the questionnaire form inquiring about the years of professional experience were evaluated, it was found that 197 (86.4%) of the participants had less than 5 years of professional experience, and 27 (11.8%) of them had 5-10 years of professional experience. 126 (55.3%) of the participants were general practitioner dentists, 79 (34.6%) were specialist dentists, and 23 (10.1%) were lecturers.

When the relationship between the answers given by age groups was analyzed :

- There was no significant difference in the answers to the question "How many of the anaphylaxis cases you have encountered resulted in death?" ($p > 0.05$).

- There was a significant difference between the age groups in terms of the answers given to the question "Do you know basic life support and its stages?" ($p < 0.05$). It is seen that those in the 33-47 age group answered no significantly higher than the other groups.

- There was a significant difference between the age groups in terms of the answers given to the question "Which drug would you prefer first in the treatment of anaphylaxis?" ($p < 0.05$). The results indicated that those in the 18-24 and 25-32 age groups gave "Epinephrine" response at a higher rate.

- There was a significant difference between the age groups in terms of the answers given to the question "Which route do you think the drug should be administered first in the treatment of anaphylaxis?" ($p < 0.05$). It is seen that all of those in the 33-47 age group answered "I don't know."

- There was a significant difference between the age groups in terms of the answers given to the question "How do you act when you see a patient who is not allergic to any drug but has other allergic diseases such as asthma, hay fever?" ($p < 0.05$). It is seen that all of those in the 25-32 and 33-47 age groups answered "I accept these problems as a risk factor and refer the patient to a specialist."

- There was a significant difference between the age groups in terms of the answers given to the question "Have you read any literature, book chapters or guides on the diagnostic criteria and treatment of anaphylaxis after graduation from the faculty of dentistry or after your specialty training?" ($p < 0.05$). It is seen that all of those in the 33-47 age group answered "I have not read, I think my knowledge is sufficient."

- There was a significant difference between age groups in terms of the answers given to the question "Which of the following is the attitude you would exhibit in the face of a patient suspected of anaphylaxis?" ($p < 0.05$). It is seen that those in the 25-32 and 33-47 age groups gave the answer "I would perform a skin test myself with the suspected drug" at a higher rate.

The data on the comparison of the answers given to the questions according to the years spent in the profession are shown in **Table 1**.

The data on the relationship between the professional status of the dentists participating in the study and their responses to the questions in the questionnaire are presented in **Table 2**.

Table 1: Data on the relationship between the length of time dentists have spent in the profession and the answers they gave.

		How many years have you been practicing this profession?						p values
		<5 years		5-15 years		Total		
		n	%	n	%	n	%	
How many of the anaphylaxis cases you encountered resulted in death?	1	196	99.5	31	100.0	227	99.6	0,998
	2	1	0.5	0	0.0	1	0.4	
	Total	197	100.0	31	100.0	228	100.0	
Do you know basic life support and its stages?	Yes	189	95.9	5	16.1	194	85.1	0,0001
	No.	8	4.1	26	83.9	34	14.9	
	Total	197	100.0	31	100.0	228	100.0	
Which drug is your first choice for treating anaphylaxis?	Dopamine	1	0.5	2	6.5	3	1.3	0,0001
	Epinephrine	189	95.9	5	16.1	194	85.1	
	Corticosteroid	6	3.0	0	0.0	6	2.6	
	Antihistamine	1	0.5	24	77.4	25	11.0	
Total	197	100.0	31	100.0	228	100.0		
Which route do you think should be the first drug to be administered in the treatment of anaphylaxis?	Intravenous	92	46.7	0	0.0	92	40.4	0,0001
	Subcutaneous	10	5.1	0	0.0	10	4.4	
	Intramuscular	87	44.2	19	61.3	106	46.5	
	I don't know	8	4.1	12	38.7	20	8.8	
Total	197	100.0	31	100.0	228	100.0		
What do you do when you see a patient who is not allergic to any medication but has other allergic diseases such as asthma or hay fever?	I do the treatment without considering other allergic problems	90	45.7	0	0.0	90	39.5	0,0001
	I recognize these problems as risk factors and refer the patient to a specialist	107	54.3	31	100.0	138	60.5	
	Total	197	100.0	31	100.0	228	100.0	
Have you read any literature, book chapters or guidelines on the diagnostic criteria and treatment of anaphylaxis after graduation from dental school or after your specialty training (can be printed source or from the internet)?	I haven't read it, I don't think it's related to my branch	14	7.1	6	19.4	20	8.8	0,0001
	I have not read it, I think my knowledge is sufficient	41	20.8	24	77.4	65	28.5	
	When I encountered such a patient, I felt the need to read	38	19.3	0	0.0	38	16.7	
	I haven't read it, I would prefer a treatment scheme that is easy to understand and easy to implement that I can refer to in an emergency.	104	52.8	1	3.2	105	46.1	
Total	197	100.0	31	100.0	228	100.0		
Which of the following is your attitude towards a patient with suspected anaphylaxis?	Starting treatment	50	25.4	1	3.2	51	22.4	0,009
	I do my own skin test with the suspected drug	145	73.6	30	96.8	175	76.8	
	I treat patients without local anesthetics	2	1.0	0	0.0	2	0.9	
	Total	197	100.0	31	100.0	228	100.0	

Table 2: Data on the relationship between the professional status of dentists and their answers to the questions in the questionnaire.

		Your professional status:								P values
		General practitioner dentist		Specialist dentist		PhD, professor		Total		
		n	%	n	%	n	%	n	%	
How many of the anaphylaxis cases you encountered resulted in death?	1 piece	126	100.0	79	100.0	22	95.7	227	99.6	0,101
	2 pieces	0	0.0	0	0.0	1	4.3	1	0.4	
	Total	126	100.0	79	100.0	23	100.0	228	100.0	
Do you know basic life support and its stages?	Yes	123	97.6	71	89.9	0	0.0	194	85.1	0,0001
	No.	3	2.4	8	10.1	23	100.0	34	14.9	
	Total	126	100.0	79	100.0	23	100.0	228	100.0	
Which drug is your first choice for treating anaphylaxis?	Dopamine	1	0.8	2	2.5	0	0.0	3	1.3	0,0001
	Epinephrine	124	98.4	70	88.6	0	0.0	194	85.1	
	Corticosteroid	0	0.0	0	0.0	6	26.1	6	2.6	
	Antihistamine	1	0.8	7	8.9	17	73.9	25	11.0	
Total	126	100.0	79	100.0	23	100.0	228	100.0		
Which route do you think should be the first drug to be administered in the treatment of anaphylaxis?	Intravenous	92	73.0	0	0.0	0	0.0	92	40.4	0,0001
	Subcutaneous	10	7.9	0	0.0	0	0.0	10	4.4	
	Intramuscular	22	17.5	79	100.0	5	21.7	106	46.5	
	I don't know	2	1.6	0	0.0	18	78.3	20	8.8	
Total	126	100.0	79	100.0	23	100.0	228	100.0		

DISCUSSION

The most important finding of this study is that dentists who are younger and have less pro-

fessional experience, i.e. who have graduated from dental school in a shorter period of time, have a better level of awareness and knowledge about anaphylaxis and its treatment compared to others. The authors comment that the usual reason for this may be that the groups with less awareness may not have read any literature, book chapters or guidelines on anaphylaxis diagnostic criteria and treatment, or that it may not have been included in the training curriculum during their training period.

Altman et al. included 266 physicians with different specialties in their study and stated that 81-98% of the participating physicians had knowledge that epinephrine was the first treatment option in anaphylaxis intervention (14). Arga and included 391 physicians, 98 dentists, 102 pharmacists and 105 school staff in their study in which they evaluated the level of knowledge of healthcare professionals about the use of epinephrine auto-injectors in case of anaphylaxis (15). In light of the data obtained as a result of the study, they stated that the level of knowledge of healthcare professionals regarding anaphylaxis management was not sufficient and their ability to use epinephrine auto-injectors correctly was also not sufficient. In this study, the rate of physicians knowing the diagnostic criteria for anaphylaxis was 47.6% and 31.6% of dentists. The rate of having correct information about the correct first intervention in case of anaphylaxis was 87.2% among physicians and 79.6% among dentists. Krishnamurthy et al. (13), in their questionnaire-based study in which they evaluated the knowledge attitude of dentists in anaphylactic cases developing due to local anesthesia in a certain region of India, concluded that dentists lacked knowledge about anaphylactic reactions and management. When the knowledge of dentists about the first drug to be administered in case of an anaphylactic reaction was questioned, a lower rate of epinephrine response was encountered in this study group than in other studies. Which is your first choice for the treatment of anaphylaxis?" 85.1% answered epinephrine, which is a rate parallel to the level of knowledge in other studies in the literature.

The National Institute of Allergy and Infectious Diseases and the Food Allergy Research and

Education define anaphylaxis as any serious allergic reaction with a rapid onset that can cause death (16). When an anaphylactic reaction develops, signs and symptoms may be as mild as urticarial rash or swelling of the lips or more severe such as difficulty breathing, wheezing and bronchospasm. In addition to these symptoms, atypical symptoms such as persistent cough, persistent dizziness or cutaneous symptoms may also occur and diagnosis may be difficult (17,18). In his study, Krishnamurthy et al. (13) asked the participants which symptoms and signs may be associated with anaphylaxis in order to question the knowledge of dentists about anaphylaxis and found very low rates of correct answers especially in atypical findings. In our study, we further expanded these symptoms and signs and aimed to investigate whether the participants were aware of the relationship between atypical symptoms and anaphylaxis by asking the participants in the study. We reached very satisfactory correct answer rates in all answers except for the complaints of itching in the throat and abdominal pain among atypical symptoms. Considering that these symptoms are associated with anaphylaxis in very rare cases, it can be considered that our study group has satisfactory knowledge of the presentation of atypical anaphylaxis. One of the biggest factors for this may be the standardized dental education in Turkey. Because in order to be able to practice dentistry in Turkey, it is necessary to graduate from a dental school in a university, and in order to be admitted to a dental school, it is necessary to do well in a very difficult and competitive exam after graduating from high school. The educational process and educational programs determined to become a dentist in Turkey are the same as in American and European schools.

Although the treatment approach for anaphylaxis does not differ in terms of age, gender or comorbid diseases, there is still controversy about the appropriate indications, timing, dose, route of administration and safety of epinephrine administration (19,20). Epinephrine by the intramuscular (IM) route is the recommended therapy of choice in current guidelines or consensus statements from the American Academy of Allergy, Asthma & Immunology (AAA-

Al) anaphylaxis guidelines, the World Allergy Organization (WAO) anaphylaxis guidelines, the NIAID/FARE food allergy guidelines, and a newer consensus recommendation (the International Consensus ON [ICON] food allergy) from the International Collaboration in Asthma, Allergy and Immunology (iCAALL) group (21–24). In their study, Arga et al. also questioned whether epinephrine was administered with the correct dose and route of administration in addition to knowing the correct treatment approach, but they encountered very low rates of correct answers, especially in dentists (15). Similarly, Krishnamurthy et al. (13) asked dentists questions about the mode of administration of epinephrine and received correct answers from only 56 dentists in this study involving 200 dentists. In our study, we were able to get correct answers from 47% of the participants in the question we asked about the mode of administration of epinephrine in case of anaphylaxis. Both in the literature and in our study, the rate of correct answers to the questions about the mode of administration of epinephrine remained below the rate of correct answers to the questions measuring the level of knowledge about anaphylaxis. This shows us that knowledge and awareness about intervention in anaphylaxis is inadequate, especially the fact that although 85% of the participants were trained and knowledgeable about basic life support, approximately 38% of them stated that they would be concerned about intervention in case of anaphylaxis, which is another indicator of this. In particular, the fact that a high proportion of the participants, 82%, stated that there was no treatment plan for anaphylaxis in their clinics was accepted by the authors as one of the important reasons for the lack of awareness on this issue.

In particular, the fact that the study was conducted in a single center and included only questionnaire-based data is one of the most prominent limitations. Since the study was conducted in a single center, this creates limitations in the generalizability of the information. The fact that the survey questions consisted of options and did not contain clear descriptive information can also be counted among the limitations. However, the large number of

participants, the fact that the questionnaire consisted of a large number of questions about anaphylaxis and the fact that there are not many studies on this subject in the literature can be considered as the strengths of the study.

In conclusion, the level of knowledge and awareness about anaphylaxis and its treatment is statistically higher in dentists who have graduated from a faculty for a shorter period of time compared to other groups. In order to increase the level of awareness and knowledge about anaphylaxis, which is a very important and vital medical condition, it is inevitable to provide training that includes up-to-date information both during and after faculty education.

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