

Evaluation of Dental Treatments in Adult Patients with Special Needs: A Retrospective Study

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Özel Gereksinimli Erişkin Hastalarda Diş Tedavilerinin Değerlendirilmesi: Retrospektif Bir Çalışma

ABSTRACT

Objective: Patients with special needs are at a higher risk of inadequate oral care, leading to dental caries or periodontal diseases. Therefore, this study aimed to retrospectively analyze the dental records of patients with special needs who received dental treatments under general anesthesia or sedation.

Methods: A total of 186 cases (170 patients) of dental general anesthesia and sedation in adult patients with special needs were included in the study from January 2015 to April 2022. Demographic data, restorative treatments, tooth extractions performed under general anesthesia/sedation, secondary diseases, type of anesthesia, and American Society of Anesthesiologists (ASA) classification were obtained from patient files. Data were recorded as mean $\pm$ standard deviation (SD) or numerical value.

Results: Of the 186 cases (mean age 28.55 ± 11.91 years), 134 (72 %) were performed under general anesthesia and 52 (28 %) under sedation. A total of 396 fillings, 775 extractions, 14 root canal treatments, and 93 scaling procedures were performed in 186 cases. On average, each case received 5.5 ± 3.4 teeth fillings, 4.5 ± 4.0 teeth extractions, and 1.6 ± 1.0 root canal treatments. Patients were classified as ASA I (n = 100) at most and ASA III (n = 5) at least.

Conclusion: Patients with special needs have a high demand for dental treatment. In dental treatment of patients with special needs under general anesthesia/sedation, dentists prefer radical treatments such as tooth extraction.

Keywords: Anesthesia; Conscious Sedation; Deep Sedation

ÖZ

Amaç: Özel bakıma ihtiyaç duyan hastalar, diş çürüğü veya periodontal hastalıklara yol açan yetersiz ağız bakımı açısından daha yüksek risk altındadır. Bu çalışma da genel anestezi veya sedasyon altında dental tedavileri yapılan özel bakıma ihtiyaç duyan hastaların dental kayıtlarının retrospektif olarak analiz edilmesi amaçlandı.

Yöntem: Ocak 2015 - Nisan 2022 tarihleri arasında özel bakıma ihtiyaç duyan yetişkin hastalardan dental genel anestezi veya sedasyonla tedavi edilen toplam 186 vaka (170 hasta) çalışmaya dahil edildi. Demografik veriler, restoratif tedaviler, genel anestezi/sedasyon altında yapılan diş çekimleri, sekonder hastalıklar, anestezi tipi ve Amerikan Anestezistler Derneği (ASA) sınıflandırması hasta dosyalarından elde edildi. Veriler ortalama $\pm$ standart sapma (SS) veya sayısal değer olarak kaydedildi.

Bulgular: 186 vakanın (ortalama yaş $28,55 \pm 11,91$ yıl) 134'ü (%72) genel anestezi altında, 52'si (%28) sedasyon altında gerçekleştirilmiştir. 186 vakada toplam 396 dolgu, 775 çekim, 14 kanal tedavisi ve 93 diş taşı temizliği yapılmıştır. Ortalama olarak her vakaya $5,5 \pm 3,4$ diş dolgusu, $4,5 \pm 4,0$ diş çekimi ve $1,6 \pm 1,0$ kök kanal tedavisi uygulanmıştır. Hastalar en fazla ASA I (n = 100) ve en az ASA III (n = 5) olarak sınıflandırılmıştır.

Sonuç: Özel bakıma ihtiyaç duyan hastaların dental tedaviye olan talepleri oldukça yüksektir. Özel gereksinime sahip hastaların genel anestezi/sedasyon altında yapılan dental tedavilerinde diş hekimleri daha çok diş çekimi gibi radikal tedavileri tercih etmektedirler.

Anahtar Kelimeler: Anestezi; Bilinçli Sedasyon; Derin Sedasyon

INTRODUCTION

Most of the studies among these methods lead to the preference of fixed prostheses due to the problems with removable prostheses Oral implantation which is one of Individuals with special needs refers to patients with mental, physical, psychiatric and complex medical problems.¹ They often struggle to maintain effective oral hygiene due to motor, sensory, or mental disabilities, resulting in serious periodontal problems and a high incidence of dental caries.²⁻⁴ Additionally, these patients often display



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weak cooperation and high anxiety, making routine dental procedures challenging or impossible.^{5,6} As healthcare professionals, it is our responsibility to ensure that patients with special needs receive optimal medical treatment. However, as it is known, in order to carry out dental treatments efficiently, effective communication with the patient is necessary.⁷ Unfortunately, it is not possible to communicate effectively with these patients. Due to these reasons, dental treatments should be personalized for such special needs patients and the most appropriate medical treatment should be provided.⁸

General anesthesia and sedation are viable treatment alternative for patients who are uncooperative and require extensive dental treatment.⁹ These methods offer advantages, such as completing the procedure in a single appointment and requiring little or no cooperation with the patient. Even so, the possibility that general anesthesia may pose a risk to the general health of the patient should not be ignored.^{10,11} Because, a significant portion of special needs patients has other medical problems and these problems can cause various complications.¹² On the other hand, many of this patient group has central nervous system diseases such as epilepsy, poor motor control, paralysis, and spasticity.¹³ Furthermore, General Dental Council of United Kingdom noted in its guidelines that "General anesthesia is a procedure which is never without a risk".¹⁴

The American Society of Anesthesiologists physical status classification (ASA) is a classification developed to categorize the preoperative condition of patients.¹⁵ This classification, the first version of which was published in 1941, has now become a scale from 1 to 6.¹⁶ The purpose of ASA classification is to assess a patient's medical comorbidities before anesthesia and to predict perioperative risks.¹⁷

This study focused specifically on dental treatments to, assess patients with special needs. In addition, the aim of this study was to retrospectively examine dental treatments for adults with special needs to contribute to the literature.

METHODS

This study presented to you has been conducted in accordance with the principles of the Declaration of Helsinki. This study was approved by the Non-Interventional Clinical Research Ethics Committee of Recep Tayyip Erdogan University (Date: 08.09.2022, Number: 2022/145). General anesthesia/ sedation treatment was applied to 910 adult and pediatric patients at the Recep Tayyip Erdogan University Faculty of Dentistry between January 1, 2015, and April 1, 2022. Patients treated under general anesthesia or sedation due to dental anxiety, major surgical procedures, and patients younger than 15 years of age were not included in the study. Only adults and patients with special needs were included in this study. Therefore, anonymized data from 170 patients were obtained from digital patient files. The anonymized data collected was as follows:

- 1. Gender
- 2. Date of birth
- 3. Date of general anesthesia/sedation
- 4. Teeth undergoing restorative treatment (filling)
- 5. Extracted teeth
- 6. Teeth undergoing root canal treatment
- 7. Scaling and tooth polishing (yes/no)
- 8. Secondary diseases
- 9. Type of anesthesia (general anesthesia/sedation)
- 10. ASA classification

The patient's age at the time of general anesthesia/sedation was obtained using the patient's date of birth and general anesthesia/sedation date.

Statistical analysis

Statistical analyses were performed using SPSS (version 23.0, IBM SPSS Corp., Armonk, NY, USA). Continuous data were tested for normality. Normally distributed data are summarized as mean and standard deviation. Data that were not normally distributed were summarized using the median (minimum-maximum). Categorical data are summarized using numbers.

RESULTS

One hundred seventy patients were treated under general anesthesia/sedation (186 cases). Fourteen patients were treated twice and one patient was treated thrice. Of the 186 cases, 134 (72 %) were conducted under general anesthesia and 52 (28 %) were performed under sedation. The mean age and gender distribution of the patients are given in Table 1. The ages of the patients ranged from 15 to 66 years and the mean age was 28.55 ± 11.91. 99 patients were male and 71 were female.

A total of 396 fillings, 775 extractions, 14 root canal treatments, and 93 scaling procedures were performed in 186 cases. On average, each case received 5.5 ± 3.4 fillings, 4.5 ± 4.0 extractions, and 1.6 ± 1.0 root canal treatments (Table 2). Moreover, a maximum of 13 fillings, 22 extractions, and 4 root canal treatments were performed at one time, in different patients (Fig. 1). The distribution of filled, extracted, and root canal treated teeth per case (0, 1 – 5, 6 – 10, 11 – 15, and > 15 teeth) is shown in Table 3. Accordingly, 114 (61.3%) of 186 cases had no filling, 14 (7.5%) had no extraction, 177 (95.2%) had no root canal treatment and 93 (50%) had no scaling. Under general anesthesia/sedation, the majority of filling and extraction treatments were applied to molars, while the least were applied to premolars. Root canal treatment was mostly performed on the anterior teeth and least frequently on the molars (Table 4).

Epilepsy is the most common secondary disease in patients with special needs. One hundred patients had no secondary diseases (Table 5). The patients were mostly classified as ASA I (n = 100) and least as ASA III (n = 5) (Table 6).

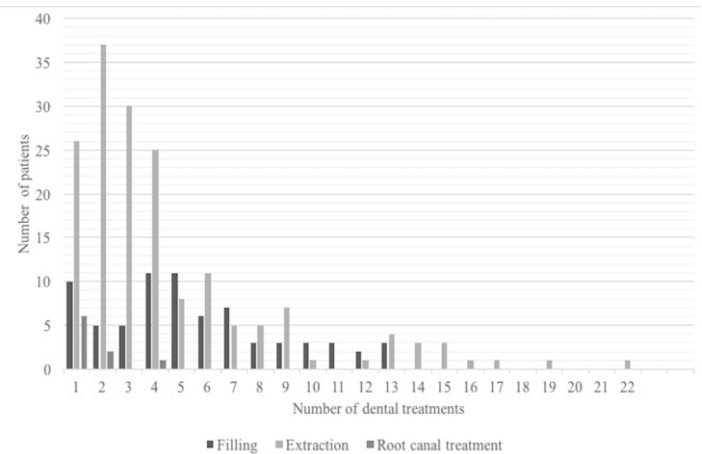


Figure 1. Distribution of the number of dental treatments performed

Table 1. Age and gender of patients

Age (Mean ± SD)	28.55 ± 11.91
Gender (n (%))	
Male	99 (58.2)
Female	71 (41.8)

Table 2. Dental treatments according to the number of teeth and case

	Total number of teeth	Total number of case	Mean (number of treatments per case)
Filling	396	72	5.5 ± 3.4
Extraction	775	172	4.5 ± 4.0
Root canal treatment	14	9	1.6 ± 1.0
Scaling	-	93	-

Table 3. Number of dental treatments performed under general anesthesia/sedation

Number of treatment teeth	Number of case (Filling)	Number of case (Extraction)	Number of case (Root canal treatment)
0	114 (61.3 %)	14 (7.5 %)	177 (95.2 %)
1 - 5	42 (22.6 %)	128 (68.8 %)	9 (4.8 %)
6 - 10	22 (11.8 %)	29 (15.6 %)	0
11 - 15	8 (4.3 %)	11 (5.9 %)	0
> 15	0	4 (2.2 %)	0
Total	186	186	186

Table 4. Number of dental treatment according to tooth groups

	Anterior n (%)	Premolar n (%)	Molar n (%)	Total
Filling	123 (31.1)	121 (30.5)	152 (38.4)	396
Extraction	184 (23.7)	163 (21.1)	428 (55.2)	775
Root canal treatment	8 (57.2)	5 (35.7)	1 (7.1)	14

Table 5. Secondary diseases of patients

Secondary diseases	n (%)
Epilepsy	25 (14.7)
Autism	9 (5.2)
Down syndrome	6 (3.5)
Hypertension	2 (1.2)
Type 2 diabetes	2 (1.2)
Cerebral palsy	2 (1.2)
Hydrocephalus	2 (1.2)
Microcephaly	2 (1.2)
Visual impairment	1 (0.6)
Renpenning syndrome	1 (0.6)
Paralysis	1 (0.6)
Epilepsy + hydrocephalus	3 (1.7)
Epilepsy + Schizophrenia + Visual impairment	2 (1.2)
Epilepsy + Type 2 diabetes	1 (0.6)
Epilepsy + Heart failure	1 (0.6)
Epilepsy + Autism	1 (0.6)
Epilepsy + Autism + Speech impediment	1 (0.6)
Epilepsy + Autism + Visual impairment	1 (0.6)
Epilepsy + Osteoporosis	1 (0.6)
Epilepsy + Cerebral palsy	1 (0.6)
Physical disability + Hypothyroidism	1 (0.6)
Hypertension + Asthma	1 (0.6)
Hypertension + Bipolar disorder	1 (0.6)
Down syndrome + Hypothyroidism	1 (0.6)
Down syndrome + Goiter	1 (0.6)
Without secondary diseases	100 (58.7)
Total	170

Table 6. ASA classification of patients

ASA classification	Definition	n (%)
ASA I	A normal healthy patient	100 (58.8)
ASA II	A patient with mild systemic disease	65 (38.3)
ASA III	A patient with severe systemic disease	5 (2.9)
ASA IV	A patient with severe systemic disease that is a constant threat to life	-
ASA V	A moribund patient who is not expected to survive without the operation	-
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	-

DISCUSSION

This study provides information about the oral health status of patients with special needs undergoing dental treatment under general anesthesia/sedation. As the special needs population ages and life expectancy increases in many countries, it is crucial to provide regular and high-quality dental care to prevent disease and enhance the quality of life for these individuals.^{18,19} In addition, the increasing demand for dental treatment among patients with special needs and the provision of appropriate treatments under optimal conditions demonstrate the quality of healthcare services and experience of healthcare professionals.

This study did not include patients under the age of 15. This is because the Republic of Türkiye Social Security Institution covers the treatments performed by the pediatric dentistry department for patients under the age of 15 years. Patients over the age of 15 years are treated in departments such as restorative dentistry and endodontics. Additionally, there are many differences between pediatric and adult patients, including age, height, weight, and others.²⁰ Furthermore, due to the different treatment approaches used for permanent and deciduous teeth, patients under the age of 15 years were not included in this study.

In this study, the number of male patients was higher than the number of female patients. Many studies in the literature, similar to our study, have also shown that male patients outnumbered female patients.²¹⁻²⁴ On the contrary, the study by de Nova Garcia et al.²³ showed that the number of female patients was higher than that of male patients. The reason for this discrepancy between studies could be the differences in age, race, gender, ethnicity, and demographic characteristics of the study populations.

There are studies that have found restorative procedures to be more demanded in patients with special needs treated under general anesthesia, especially in adolescents and adults, compared to extraction treatment.^{25,26} Conversely, Ali et al.²⁷ indicated that extractions are performed more frequently than restorations in patients with special needs between the ages of 16 and 75 years. In the present study, extraction was the most preferred treatment. More aggressive treatment approaches have been preferred in patients with special needs to prevent the need for re-general anesthesia and to reduce the risk of complications by reducing the procedure time. Although root canal treatment is performed in some cases with a conservative approach, extraction has been preferred for deeply decayed teeth because of the difficulties in taking X-rays under general anesthesia and the potential complications that may occur after treatment. It is noteworthy that in this study, the number of extractions and fillings was low in the 9 patients who underwent root canal treatment.

In this study, scaling was not performed on half of the patients. In most patients with special needs, multiple dental treatments are simultaneously performed at the same time. The remaining number of teeth in the mouth was low because of the high number of planned tooth extractions. Additionally, dental calculus is less commonly seen in patients with a high incidence of dental caries.²⁸ Therefore, in patients with special needs, the existing plaque was easily removed by polishing without the need for scaling.

In this study, the majority of patients with special needs were treated under general anesthesia. When choosing the type of anesthesia, many factors such as patient cooperation, the extent of the treatment plan, and treatment duration play an important role. Sedation is generally preferred for simple and few tooth extractions.

Because filling or scaling procedures are performed under pressurized water cooling and can prolong the procedure time, sedation is not a suitable anesthesia type for these patients. Therefore, in this study, multiple treatments and time-consuming procedures were performed under general anesthesia.²⁹

Not all patients with special needs have the same disability or need for dental treatment. Therefore, if possible, treatment of some patients was attempted in a clinical setting with or without local anesthesia. In addition to preferring less traumatic techniques, such as chemo-mechanical caries removal agents or lasers in the treatment of these patients, the treatment times were kept short to prevent disruption of the patient's compliance with the treatment. Thus, the need for general anesthesia/sedation was eliminated in patients with special needs who were able to comply with simple and few treatments. However, the treatments of some patients with special needs can be challenging and time-consuming.³⁰ In fact, even intraoral examination may not be possible. Therefore, general anesthesia and sedation may be the only treatment options. As mentioned before, to minimize potential complications that may arise in these patients, all treatments performed under general anesthesia/sedation should be carried out in comprehensive healthcare institutions by experienced healthcare personnel.³¹

Regular follow-up appointments are crucial for long-term success of dental treatment under general anesthesia/sedation. Oral hygiene and dietary education provided to parents or caregivers of patients with special needs can prevent new caries and/or periodontal disease in these patients. In some studies in the literature, follow-up appointments were scheduled after general anesthesia.^{22,24} However, the lack of a regular follow-up program for patients treated under general anesthesia/sedation in this study is a significant limitation. Regular follow-up appointments, oral hygiene and diet education provided to caregivers and parents of patients with special needs can significantly reduce the need for repeated general anesthesia for dental treatments.³²

Isolation is essential for successful restorative treatment. This also applies to restorative treatments performed under general anesthesia/sedation. Although the patient's saliva flow is reduced due to general anesthesia/sedation, it is very difficult to exclude oral tissues, especially the tongue, from the operation area. Gingival bleeding is also more common in patients with special needs due to poor oral hygiene.³³ Despite all these, preventive and restorative treatment of patients with special needs under general anesthesia/sedation has an important advantage in terms of preventing tooth loss and allowing conservative treatments.³⁴

General anesthesia and sedation should be considered as the last treatment option for dental treatments of patients with special needs.³⁵ However, successful dental treatments can be performed with general anesthesia/sedation practices performed by experienced healthcare professionals in comprehensive healthcare institutions in mandatory cases.

The demand for dental treatment in patients with special needs is continuously increasing. Patients with special needs may have an additional systemic disease. Furthermore, dentists often prefer for more radical treatment options, such as tooth extraction, in the dental treatment of patients with special needs.

Ethics Committee Approval: Approved by Recep Tayyip Erdoğan University, Non-Interventional Clinical Research Ethics Committee (Date: 08.09.2022, Number: 2022/145).

Informed Consent: Since the study was retrospective, written permission was obtained from the Dean of Recep Tayyip Erdoğan University, Faculty of Dentistry to obtain the patient data recorded in the system.

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