

# Evaluation of the characteristics and treatment modalities of the patients with disabilities treated under general anesthesia

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## SUMMARY

This retrospective study evaluated the characteristics and treatment modalities performed under general anesthesia in dental patients with disabilities at Departments of Oral and Maxillofacial Surgery and Pediatric Dentistry of Gülhane Military Medical Academy between 2009 and 2011. A total of 70 (mean age 11.6); 49 male (70%), 21 female (30%) patients were included, and the treatment needs were recorded. All dental procedures were performed by at least one oral and maxillofacial surgeon and one pediatric dentist working at the same institution. Seven cases were autistic (10%), 19 were cerebral palsy (27.1%), 39 were mental retardation (55.7%) and 5 were Down's syndrome (7.1%). Filling was the most required treatment (Mean value 3.8). The mean ages of patients with cerebral palsy and mental retardation were higher than that of the patients with Down's syndrome. Down's syndrome was the diagnosis with the least need for treatment (Mean value 5.6). Providing early treatment for children with a chronic illness and/or a disability may improve their dental health and maintain full dentition so as to reduce the number of subsequent teeth extractions. It is recommended to refer these children at an earlier age to a hospital where tooth restoration under general anesthesia can be performed.

**Key words:** Dental care, dental care plan, disabled patients, general anesthesia

## ÖZET

### Engelli hastalara genel anestezi altında yapılan dental tedavilerin özelliklerinin ve tedavi yöntemlerinin değerlendirilmesi

Bu retrospektif çalışmada Gülhane Askeri Tıp Akademisi Ağız Diş Çene Cerrahisi ve Çocuk Diş Hekimliği Ana Bilim Dallarında engelli hastalara 2009-2011 yılları arasında genel anestezi altında yapılan dental tedavilerin özellikleri ve tedavi modaliteleri değerlendirilmiştir. Kırk dokuzu erkek (%70), 21'i kız (%30) toplam 70 engelli hasta (Ortalama yaş: 11.6 yıl) çalışmaya dahil edilmiş ve tedavi ihtiyaçları kaydedilmiştir. Tüm tedaviler aynı merkezde çalışan en az bir maksillofasiyal cerrah ve bir çocuk diş hekimi tarafından uygulanmıştır. Çalışmaya alınan hastaların 7'si otistik (%10), 19'u serebral palsili (%27.1), 39'u mental retarde (%55.7), 5'i Down sendromlu (%7.1). Dolgu en fazla ihtiyaç duyulan tedavi şekliydi (Ortalama değer 3.8). Serebral palsili ve mental retarde hastaların ortalama yaşı Down sendromlu hastalarından daha yüksek bulundu. Down sendromu dental tedaviye en az ihtiyacı olan tanı idi (Ortalama değer 5.6). Kronik hastalığı ve/veya engelli olan hastalarda erken tedavi, dental sağlığın ve bütünlüğün korunmasını sağlayarak ağızdaki çekilmiş diş sayısının azalmasına katkı sağlayabilir. Bu hastaların genel anestezi altında dental tedavi uygulanabilecek bir merkeze daha erken yaşta yönlendirilmesi tavsiye edilmektedir.

**Anahtar kelimeler:** Diş bakımı, diş bakım planı, engelli hastalar, genel anestezi

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## Introduction

According to the World Health Organization (WHO), "disabilities" is an umbrella term covering impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure. An activity limitation is defined as a difficulty encountered by an individual in executing a task or action while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus, disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives (1). Disability may affect a wide part of the population of all social classes and ages. Almost 3% of children aged 16 and under are estimated to have one or more disability of which more than a quarter have limitations affecting locomotion. The prevalence of disability increases with age (2).

Recent research shows that the incidence of oral and dental health problems of disabilities are quite high compared to normal individuals (3,4). These patients have physical disabilities that affect daily life activities and influence the delivery of health care, including dental care. Caries, gingivitis and periodontal disease are the most outstanding oral health problems among mentally handicapped people (4).

The majority of normal children can be adequately treated with nonpharmacologic behavior modification techniques such as the tell-show-do technique. In many cases, it is necessary to use general anesthesia (GA) to provide an effective and safe treatment for patients with disabilities (5). It offers a total oral rehabilitation in a single course, including a full mouth prophylaxis treatment, operative dental restoration,

pulp therapy, tooth extraction, stainless steel crown reconstruction, and preventive resin restoration. The disadvantages related with GA are a necessity of the specialized department and expensiveness (6).

This study was carried out to assess the outcomes of the comprehensive dental treatment provided under GA at the Departments of Oral and Maxillofacial Surgery and Pediatric Dentistry of Dental Sciences Center of Gulhane Military Medical Academy (GMMA). The study focused on the period of 2009 and 2011 and aimed to find out the differences in oral health status of patients with disabilities and determine the number of extractions and fillings per patient treated under GA.

### Material and Methods

**Subjects:** Informed written consent was obtained from the ethics committee of the GMMA. The database for this study involved all patients treated under general anesthesia at the Oral and Maxillofacial Surgery and Pediatric Dentistry Department of GMMA between 2009 and 2011. Patients, who need only one treatment such as one tooth extraction, have not been included in the study. Their needs were solved in local clinical conditions.

**Data collection:** A total of 70 patients received dental and anesthetic pre-operative assessments. Dental assessment included a dental and medical history, clinical examination, oral radiographs and appropriate hematological tests. A provisional treatment plan for each patient was formulated and advice on prevention was given to the parents. A consultant anesthesiologist made an assessment of the patient's suitability for general anesthesia and commented on any precautions to be taken. On the day of the operation, the treatment plan was finalized and consent was obtained by either one oral and maxillofacial surgeon or one pediatric dentist. The dental treatments were carried out under general anesthesia with nasotracheal intubation. All dental treatments were performed by one oral and maxillofacial surgeon and one pediatric dentist. Unless there were other adverse

conditions, the patient was discharged one hour after recovery. The data from their personal profiles were retrospectively reviewed, including general history, dental history and treatment modalities, such as the number of restorative primary teeth, restorative permanent teeth, extracted primary teeth, and extracted permanent teeth.

**Statistical analysis:** The data were recorded and analyzed using a two-sample t-test and Kruskal Wallis test, with  $p < 0.05$ , indicating significance using the SPSS (IBM, Chicago, U.S.A.) 15.0 program.

### Results

The data of a total 70 cases were evaluated (49 male (70%), 21 female (30%)). Seven cases were autistic (10%), 19 were cerebral palsy (27.1%), 39 were mental retardation (55.7%) and 5 were Down's syndrome (7.1%) (Table I). Median age score for the whole population was 11.6. Filing was the most required treatment (Mean value 3.8) among all the cases. The mean ages of patients with cerebral palsy and mental retardation were higher than the ones with Down's syndrome. Down's syndrome was the diagnosis with the least need for treatment (Mean value 5.6) (Table II).

### Discussion

Special health care needs are defined by the American Academy of Pediatric Dentistry (AAPD) as "any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs" (6). It is known that the special patient population and disabled children require special treatment, which is not easy to ensure because it depends on the compliance of the anesthesiologist, dentist and the parents of the patient.

It is necessary, in some cases, to conduct treatment under GA. It offers a fast, safe, comfortable and convenient method for the patient and the dentist (5). The disadvantages of GA are necessity of the specialized department and expensiveness, and GA also in-

**Table I. Number of patients included in the study**

	<i>Autistic</i>	<i>Cerebral palsy</i>	<i>Mental retardation</i>	<i>Down's syndrome</i>	<i>Total</i>
Male	6 (8.5%)	10 (14.2%)	30 (42.2%)	3 (4.2%)	49 (70%)
Female	1 (1.5%)	9 (17.1%)	9 (13.5%)	2 (2.9%)	21 (30%)
Total	7 (10%)	19 (27.1%)	39 (55.7%)	5 (7.1%)	70 (100%)

**Table II. Distribution of the patients according to the mean number of filling and extraction**

	<i>Mean age (min-max)</i>	<i>Mean number of filling (min-max)</i>	<i>Mean number of extraction (min-max)</i>
Autistic (n=7)	9 (7-35)	3 (2-5)	3 (2-4)
Cerebral palsy (n=19)	14 (5-35)	5 (1-8)	2 (1-5)
Mental retardation (n=39)	11 (4-42)	3 (1-8)	2 (1-5)
Down's syndrome (n=5)	10 (8-13)	3 (2-3)	3 (2-5)
p value*	0.292	0.084	0.193

\*: with Kruskal Wallis test

volves problems with gaining intravenous access for disabled patients. Another potential hazard in this group of patients is the risk of drug interactions (5,7).

Stanková et al. evaluated the results obtained from the documentation of patients with disabilities, who have undergone treatment under general anesthesia at the pediatric dentistry department (5). As a result they determined that the number of males (63%) were more than girls (37%) who have undergone treatment under general anesthesia. In our study, 70 subjects with special health care needs received treatment on GA during a single operation in average. The number of males was more than females (49 males (70%), 21 females (30%)). Boys may need dental treatment more than girls.

The median age score of our patients was 11.6. Such age is about four years after the eruption of the permanent incisors and molars, which actually means mixed dentition. Usually, many cavities are found in such a period, but dental treatments are difficult without cooperation. In such conditions if the patients have cavities and no cooperation, GA is recommended for reducing the stress in both the patients and their parents (8). When the distribution of patients according to the mean age was evaluated there was no statistically significance between the groups ( $p=0.292$ ) (Table II).

The incidence of dental decay in persons with Down's syndrome has been reported to be extremely low. It is theorized that this may be due to delayed eruption of the teeth, increased spacing between teeth or possible differences in the chemical content of the saliva (9). According to our study, 7 cases were autistic (10%), 19 were cerebral palsy (27.1%), 39 were mental retardation (55.7%) and 5 were Down's syndrome (7.1%). The number of patients with cerebral palsy and mental retardation was higher than the ones with Down's syndrome. Down's syndrome

was the diagnosis with the least need for treatment (Mean value 5.6). The reasons for this may include the following: the patients with Down's syndrome can be educated in proper oral hygiene, and receive the benefits of topical and systemic fluoride. Also, cooperation can easily be established for dental treatment with patients.

Pei-Ying Lee et al. evaluated the characteristics and treatment modalities performed under general anesthesia in pediatric dental patients and compared the different treatment patterns performed in healthy children and children with special health care needs (10). As a result they determined that the mean number of extracted teeth was significantly greater in disabled patients according to healthy children for both primary and permanent teeth. In disabled group they found that the total number of filled teeth more than the extracted teeth. In our study filling was the most required treatment (Mean value 3.8) when compared to extraction. It appears reasonable to conclude that pediatric dentist in the present study modified the treatment protocol and did not apply a more-aggressive dental treatment strategy, such as preserving of teeth rather than the extraction of them. When the distribution of patients according to the mean number of filling and extraction were evaluated there was no statistically significance between the groups ( $p=0.084$  and  $p=0.193$ , respectively) (Table II).

In this study the results point out that the oral hygiene of mentally handicapped children is extremely poor (mean 6.2 treated caries for each person), and for this reason preventive procedures are very important. More efforts should be made to encourage the patients to visit the dentist earlier and receive primary preventive care.

There are many disabled patients who undergo dentistry with GA but providing GA to these patients

requires skills that are often different from those used in routine hospital anesthetic practice. Additionally, GA has many disadvantages such as the necessity for the specialized department, expensiveness and risk of drug interactions.

In conclusion, early diagnosis of caries, oral hygiene education and regular dental checkups in disabled patients are important to prevent the potential hazards of GA.

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