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Original Article

Oral health status of children with special health care needs receiving dental treatment under general anesthesia at the dental clinic of Taipei Veterans General Hospital in Taiwan

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Abstract

Background: Oral health is crucial to individual growth and development. However, oral health care is often overlooked in children with special health care needs (CSHCN). We investigated current oral health status and unmet dental needs of CSHCN in Taiwan.
Methods: We performed a retrospective study of consecutive CSHCN cases receiving first-time comprehensive dental treatment under general anesthesia at Taipei Veterans General hospital from 2001 to 2010. We retrieved clinical data including age, sex, types, and severity of disability, caries experience index [decayed, extracted, and filled teeth (deft) index for primary dentition/decayed, missing, and filled teeth (DMFT) index for permanent dentition], malocclusion, and treatment modalities from medical charts for analysis. The correlation between different groups of CSHCN regarding the deft/DMFT indices and treatment modalities was analyzed statistically.
Results: Our study included 96 children, ranging in age from 2.4 years to 14.3 years (mean age 6.8 ± 3.3 years). The deft/DMFT index was significantly higher in the younger age group (2–6 years; 13.8 ± 4.3) compared with the older group (> 6 years; 10.5 ± 5.3; $p < 0.001$). The mean number of total treated teeth was 14.2 ± 3.8, and no differences existed among disability groups ($p = 0.528$) and age groups ($p = 0.992$). For the treatment modality, the number of pulp therapies with crown restoration was higher in the younger age group than in the older group. At the time of the study, 53 CSHCN had reached their full permanent dentition. We observed significantly more malocclusion of full permanent dentition in the older age group (91%) than in the younger group (35%; $p < 0.001$).
Conclusion: Unmet dental needs and caries experience indices remain high in CSHCN, regardless of the types and severity of disability. However, the younger the age at which CSHCN received their first dental treatment, the more effective the dental rehabilitation was. Parental education regarding early dental intervention and a preventive approach for enhanced oral care is mandatory.

Keywords: comprehensive dental care; deft/DMFT index; dental care for children; disabled children

1. Introduction

Children with special health care needs (CSHCN) are a special group of patients suffering from various systemic disorders such as physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or a limiting condition that requires medical management, health care intervention, and specialized services or programs.[1] Because of their limited motor and sensory coordination, most children

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with disabilities do not have the ability and awareness to care for themselves and must rely on their parents or caregivers for general care. Oral health care is often overlooked in these children. Studies of several populations have shown high unmet dental needs among CSHCN, such as those with cerebral palsy, autism, developmental delay, and Down syndrome.[2–4] Because their complex situations often exhaust their care providers and certain caregivers do not possess essential knowledge to detect potential dental problems, dental needs have become the leading unmet medical health concern for CSHCN.[3,5–8]

Dental caries are the most dominant unmet oral health problem in children.[9] Numerous studies conducted in day care centers or school institutions have shown that dental caries experiences were significantly higher in CSHCN than in normal children in previous decades.[10,11] The prevalence of a poor oral hygiene index, gingival and periodontal disease,[10,12–14] and malocclusion[10,15] were also high in CSHCN.

Oral health status and comprehensive dental care in CSHCN has been widely discussed in other countries throughout recent decades. However, only a few studies have investigated the oral health care status and dental needs of CSHCN in Taiwan. We conducted a retrospective study of the oral health status of CSHCN who received their first comprehensive dental treatment at Taipei Veterans General Hospital (Taipei, Taiwan) to analyze whether different patterns of dental treatment exist across disability and age groups.

2. Methods

CSHCN receiving comprehensive dental rehabilitation under general anesthesia from 2001 to 2010 at Taipei Veterans General Hospital were enrolled in our survey. The Institutional Review Board, Taipei Veterans General Hospital approved this study (VGHIRB No. 2013-03-027B). All participants who attended our hospital setting were first examined to evaluate their behavioral capabilities and their psychological and physical disabilities. Qualified pediatric dentists performed charting and oral examination. The inclusion criteria included children aged younger than 14 years at the time of dental intervention, and children with national disability certificates and no prior dental experience or treatments. Children with cancer or chronic progressive diseases such as congenital heart disease, insulin-dependent diabetes mellitus, and metabolic disorders were excluded from the survey. Prior to dental treatment procedures, we consulted with the corresponding pediatric physicians and anesthesiologists on the systemic conditions for each participant to ensure no absolute contraindications for general anesthesia during the procedure.

All of the patients received the treatment modality of full-mouth dental restoration in compliance with the standard principles. Fissure sealants were applied to posterior teeth affected with deep pits and fissures. For tooth restorations, composite resin filling (CRF) was applied according to the preparation of each cavity. Pulp therapy was indicated for teeth with deep and multiple-surface caries, followed by stainless steel crowns for posterior teeth and strip crowns for anterior teeth. Extraction was considered for teeth with severe decay that resulted in poor restorability or those with periapical lesions or mobility that could potentially harm the corresponding succedaneous teeth. Every patient was scheduled for a periodic recall every 3–6 months for basic oral health maintenance. Malocclusion was evaluated when the patient reached full permanent dentition at approximately 12 years of age. Malalignment of dentition, deep bite, anterior open bite, cross-bite, ectopic eruption of permanent canines, or impacted permanent premolars and canines were viewed as malocclusion.

We collected data from each participant, including age, sex, medical diagnosis and severity of disability, oral health status, and types and numbers of treatments. Types and severity of disability were recorded according to the patient's National Disability Certificate and medical history records. Diagnoses included autism, mental retardation, limb disability, infrequent disease caused by DNA impairment, vision disability, voice or speech mechanism disability, loss of function of primary organs, and balance mechanism disability. Children with two or more medical diagnoses were considered to constitute multi-disabilities.

Dental caries were recorded based on the World Health Organization (WHO) oral health survey criteria and methods using the decayed, extracted, and filled teeth (deft) index for primary dentition and the decayed, missing, and filled teeth (DMFT) index for permanent dentition. In cases of early and late-mixed dentition, we combined the two indices to assess the degree of total caries. We also recorded the numbers and types of treated teeth and the malocclusion condition at the approximate patient age of 12 years for further statistical analysis.

We compiled and calculated the frequency and distribution of patients' general characteristics and dichotomized the patients into two groups according to age (young: 2–6 years vs. older: $>$ 6 years). We assessed the correlation between the age groups and oral health status by using the independent t test and the Chi-square test, and demonstrated the relationship between the type and severity of disabilities and oral health status by using a one-way analysis of variance (ANOVA) and a Chi-square test. We performed statistical analysis using SPSS version 17 (SPSS Inc., Chicago, IL, USA).

3. Results

Among the 96 participants, 62 boys and 34 girls were enrolled in our survey. Patient ages ranged from 2.4 years to 14.3 years (mean: 6.8 $\pm$ 3.3 years). For age, 39 patients were between 2 years and 6 years (young age group) and 56 were older than 6 years (older age group). According to the disease entity, most of the disabilities in patients attending our hospital were autism (31%), multi-disabilities (MD; 30%), mental retardation (MR; 19%), and others (20%), including seven cerebral palsy, two voice or speech mechanism disability, two vision disability, and one balance mechanism