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ORIGINAL RESEARCH

Comparative Evaluation of Pediatric Patients with Mental Retardation undergoing Dental Treatment under General Anesthesia: A Retrospective Analysis

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ABSTRACT

Introduction: Behavioral management of patients forms one of the foremost components of pediatric dental treatment. Some children readily cooperate with dental treatment, while others require general anesthesia as a part of treatment protocol for carrying out various dental procedures. Hence, we evaluated the pediatric patients with and without mental retardation, who underwent dental treatment under general anesthesia.

Materials and methods: The present study analyzed the record of 480 pediatric patients reporting in the department of pedodontics from 2008 to 2014. Analysis of the records of the patients who underwent dental treatment under general anesthesia was done and all the patients were divided into two study groups depending upon their mental level. For the purpose of evaluation, the patients were also grouped according to their age; 4 to 7 years, 8 to 12 years, and 13 to 18 years. Measurement of decayed, missing, and filled teeth and scores for both deciduous and permanent dentition was done before and after the commencement of the dental treatment. Chi-square test and independent t-test were used for evaluating the level of significance.

Results: While comparing the patients in the two groups, maximum number of patients is present in the age group of 13 to 18 years. While comparing the indices' score between the two study groups in various age intervals, no statistically significant results were obtained. Restorative treatment and dental extractions were the most common dental treatments that were seen at a higher frequency in the intellectual disability study group.

Conclusion: In patients with mental retardation, a higher frequency of restorative treatment and extractions occurs as compared to healthy subjects of similar age group. Therefore, they require special attention regarding maintenance of their oral health.

Clinical significance: Special attention should be given for maintaining the oral health of patients with special health care needs as compared to their physically and mentally normal counterparts.

Keywords: Mental retardation, Pediatric, Treatment.

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INTRODUCTION

One of the important aspects of pediatric dental treatment involves the behavioral management of the patients. Some children accept the dental treatment very cooperatively, whereas some patients do not respond well to the behavioral management part and require general anesthesia as a part of their dental treatment.[1-6] Pediatric patients with special needs are provided with comprehensive dental treatment at the pediatric wing of the hospitals in various countries. Patients with special needs are treated at conscious state by private clinics. Behavioral management comes into play for the treatment of apprehensive or

noncooperative patients. However, general anesthesia is used for treating patients who are suffering from extreme anxiety problems, mental retardation, physical disability, or the patients who are highly uncooperative.[5] Hence, we evaluated the pediatric patients with and without mental retardation, who underwent dental treatment under general anesthesia.

MATERIALS AND METHODS

The present study analyzed the patients reporting in the department of pedodontics of the dental institution. Records of the patients who underwent dental treatment under general anesthesia from 2008 to 2014 were analyzed. Complete study protocol was presented to the institution in written and ethical approval was taken. Data of 480 subjects were assessed and all the patients were grouped based on their mental level. Group I contained patients with special health care needs, while group II, had healthy controls. Various treatment records of the patients were obtained and tabulated for evaluation. The patients with any systemic disease, organ dysfunction, known drug allergy, extremely noncooperation, not in age group of 4 to 18 years, etc., were excluded from the study. Written consent from the guardian/parents of the patient was obtained. All the dental treatment was carried under general anesthesia. For the purpose of evaluation, the patients were also grouped according to their age; 4 to 7 years, 8 to 12 years, and 13 to 18 years. Measurement of decayed (d), missing (m), and filled (f) teeth (dmft) and the DMFT scores for both deciduous and permanent dentition was done before and after the commencement of the dental treatment.

$$\text{DMFT/dmft} = \frac{\text{d teeth} + \text{m teeth} + \text{f teeth}}{\text{Total person}}$$

Community periodontal index (CPI) was used for assessing the periodontal status of the patients using CPI probe. Patient's requirement of dental treatment was evaluated based on findings of these criteria and presence or absence of dental caries. All the results were analyzed by SPSS software. Chi-square test and independent t-test were used for evaluating the level of significance.

RESULTS

Table 1 shows the distribution of patients according to their age and mental level. Maximum number of patients is present in the intellectual disability group and in age group of 13 to 18 years. Comparison of dmf-t and DMF-T indices between healthy subjects and subjects with special health care need is shown in Table 2. No statistically significant results were obtained on comparing the indices' score between the two study groups in various age intervals. Tables 3 to 5 shows the p-value for dental treatment provided between healthy subjects and children with special needs at 4 to 7 years, 8 to 12 years, and 13 to 18 years of age respectively. Significant results were obtained while analyzing the patients who underwent restorative treatment and dental extractions in the two study groups (p-value < 0.05).

Table 1: Age group distribution of subjects

Age group	*Intellectual disability (Group I)*	*Healthy subjects (Group II)*	*Total*
3–6	93	94	187
7–12	111	28	139
13–18	146	8	154
Total	350	130	480

Table 2: Comparison of dmf-t and DMF-T indices between healthy subjects and subject with special health care needs

		Age groups		
Groups		*4–7 years (p-value = 0.452)*	*8–12 years (p-value = 0.512)*	*13–18 years (p-value = 0.351)*
Mean dmf-t	Group I	3.25	6.05	–
	Group II	3.45	4.55	–
Mean DMF-T	Group I	–	4.35	7.45
	Group II	–	2.50	4.05

Table 3: The p-value for dental treatment provided between healthy subjects and children with special needs at 4 to 7 years of age

Treatment provided		*Group I (%)*	*Group II (%)*	*p-value*
Restoration	Deciduous teeth	13.2	8.1	0.001
	Permanent teeth	2.9	1.2	0.081
Pit and fissure sealants		6.1	4.5	0.314
Extraction of teeth	Deciduous teeth	10.5	6.1	0.001
	Permanent teeth	1.1	1.1	0.045
Treatment of periodontium		0.9	0.5	0.041

Table 4: The p value for dental treatment provided for healthy subjects and children with special needs at 8 to 12 years of age

Treatment provided		*Group I (%)*	*Group II (%)*	*p-value*
Restoration	Deciduous teeth	4.2	12.1	0.001
	Permanent teeth	1.5	8.4	0.071
Pit and fissure sealants		7.1	3.2	0.384
Extraction of teeth	Deciduous teeth	8.1	10.1	0.612
	Permanent teeth	1.7	6.2	0.001
Treatment of periodontium		1.2	2.7	0.150

Table 5: The p value for dental treatment provided for healthy subjects and children with special needs at 13 to 18 years of age

Treatment provided		*Group I (%)*	*Group II (%)*	*p-value*
Restoration	Deciduous teeth	–	–	–
	Permanent teeth	1.1	0	0.001
Pit and fissure sealants		7.5	15.1	0.084
Extraction of teeth	Deciduous teeth	–	–	–
	Permanent teeth	17.5	5.1	0.001
Treatment of periodontium		2.8	1.5	0.748

DISCUSSION

Most of the studies in pediatric patients stress on the utilization of general anesthesia for the treatment of anxious, fearful, noncooperative children along with children with special health care needs.[6-9] Studies also advocate that such procedures should be carried out in a hospital-based setup rather than a private clinic.[10-12] Also, the patient's age, grade of its uncooperative behavior along with complete medical history decides the need for general anesthesia.[9,11,13] Therefore, improving the behavior of the pediatric patient toward the dental treatment can minimize the need for general anesthesia.[14] Hence, we evaluated the pediatric patients with and without mental retardation, who underwent dental treatment under general anesthesia.

In the present study, 146 patients with intellectual disability belonged to the age group of 13 to 18 years as shown in Table 1. Similar results were obtained by Savanheimo et al[15] who also found maximum patients with intellectual disability in the similar age group. Also, no significant results were obtained while comparing the dmft/DMFT index between various age groups (Table 2). Our results were in correlation with the results of Sari et al,[16] who reported similar findings in their study. While evaluating the dmft index in the 4 to 7 years age group, a very close relationship was observed between healthy individuals and the patients of the study group as shown in Table 3. On the contrary, in the patients with age group of 8 to 12 years of age, a high indices value was found in patients with intellectual disability (Table 4). Similar finding was observed in patients of 13 to 18 years of age group with high values of indices occurring in intellectually disable group as shown in Table 5. Similar findings are reported in the work of Harrison et al and Sari et al.[16] A higher incidence of oral problems in patients with mental retardation has been reported by Vignehsa et al.[17] In the present study, for all the age groups, a higher prevalence of dental treatment is observed in patients with intellectual disability. Nunn et al[18] and Shyama et al[19] reported similar findings in their respective studies. Greater attention should be paid to the dental treatment of such patients as compared the physical and mentally healthy children as higher number of restorative treatments and extraction have been observed in the present study (Tables 3 to 5). Lewis et al reviewed the progression in children's oral health science the Surgeon General's Report on Oral Health. They summarized that children with special health care needs receive extra efforts and care when preventive dental treatment is concerned. They recommended conducting surveys to obtain data about dental needs and care of such children.[20] According to the data of Federal government, more than 10% of Americans, aged from 0 to 18 years of age, fulfill the criteria defined for children with special care needs. Accordingly, treatment of such children imposes a great challenge for both the pediatricians and the pediatric dentists to meet their behavioral and health care needs.[21] Salles et al investigated the dental needs and management of special health care needs children in Brazil. They analyzed the records of 428 pediatric patients receiving dental care in the department of pediatric dentistry from 1996 to 2009. They found that more medication is required for children with various medical conditions. From the results, they recommended the development of effective oral health programs to educate the parents of such children.[22] Ohtawa et al retrospectively analyzed the referral routes and the type of dental treatment done in patients under general anesthesia. From the results, they observed returning of the patients to the referring medical institution that subsequently manages the same patient.[8] Sitkin et al assessed the efficacy and safety of sevoflurane-induced general anesthesia in carrying out dental care procedures in mentally retarded children. They analyzed 95 pediatric patients and observed respiratory depression with elevated levels of carbon dioxide in all mentally retarded children undergoing dental treatment under general anesthesia with sevoflurane. From the results, they concluded that artificial lung ventilation is required while carrying out long dental treatment in mentally retarded children.[23] Ajami et al analyzed 1621 children in 13 different special schools with the help of mouth mirrors and explorers. They found a high frequency of caries in mental retardation and visual impairment children in comparison to children with impaired hearing.[6] Lee et al evaluated and compared the various treatment options available and performed in healthy children and children with special health care needs at Taipei Chang Gung Memorial Hospital. They reviewed the data of pediatric patients from 2004 to 2005 who underwent dental treatment under general anesthesia. From the results, they concluded that general anesthesia is beneficial and efficient for performing dental treatment of young children with special health care needs.[24]

CONCLUSION

From the results obtained, it can be concluded that higher frequency of restorative treatment and extractions occurs in patients with mental retardation as compared to healthy subjects of similar age group. Hence, special attention should be given to such children to maintain good oral health.

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