

Periodic Oral Care under Ambulatory General Anesthesia Prolongs Tooth Life in Patients with Intellectual Disabilities

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Abstract

Aims: The effect of periodic biannual oral care under ambulatory general anesthesia for patients with intellectual disabilities who are markedly uncooperative undergo. **Methods:** The details of dental procedures were compared retrospectively between the cure group (58 patients with intellectual disabilities who visited our hospital after the appearance of a symptom such as pain) and the care group (61 patients with intellectual disabilities who underwent periodic biannual oral care under ambulatory general anesthesia). **Results:** In the care group, the frequencies of dental treatment while conscious and while under general anesthesia decreased to 2/3 ($p<0.01$), the numbers of tooth extraction and pulp extirpation decreased to 1/9 ($p<0.01$), and the frequencies of root canal treatment and tooth restoration decreased to 1/15 ($p<0.01$) and 1/3 ($p<0.01$), respectively, which were significant differences. **Conclusion:** For patients with intellectual disabilities who strongly refuse treatment, periodic biannual oral care (professional tooth cleaning, scaling, and filling incipient dental caries) under ambulatory general anesthesia is effective to maintain their occlusal health. It also can reduce the frequency of invasive procedures as well as medical expenses.

Key Words: Ambulatory general anesthesia, Periodic oral care, Intellectual disability

Introduction

For patients with intellectual disabilities, it is almost impossible to apply a prosthesis using an implant, bridge, or denture after losing teeth; therefore, periodic oral care (professional tooth cleaning, scaling, and filling incipient dental caries) is very important to maintain healthy teeth [1]. From a recent report [2], it is estimated that the number of DMFT in permanent teeth increased approximately 0.5/year until 20-year even in normal individual. Moreover, oral care for the patients with intellectual disabilities is so difficult while totally conscious. In our hospital, patients with intellectual disabilities who are markedly uncooperative undergo periodic biannual oral care under ambulatory general anesthesia. In this study, the details of dental procedures were statistically compared between patients with intellectual disabilities who visited our hospital after the appearance of a symptom (pain etc.) and those who underwent periodic biannual oral care under ambulatory general anesthesia.

Materials and Methods

This research was designed as a retrospective study, and this study passed through the approval of an ethics panel in our university. Subjects were 119 patients with intellectual disabilities who had undergone dental procedures under

ambulatory general anesthesia in our hospital during the previous five years (from April 2006 to March 2011). These patients were divided into two groups as follows: 58 patients who visited our hospital after the appearance of symptoms such as pain, discomfort, or swelling etc. (cure group), and 61 patients who underwent biannual periodic oral care such as professional tooth cleaning, scaling, or filling incipient dental caries under ambulatory general anesthesia without symptoms (care group). In the cure group, there were 36 male and 22 female patients with an average age of 35.2 ± 10.3 (Table 1). Complicating diseases were intellectual disability (51 patients, 87%), epilepsy (28 patients, 43%), autism (15 patients, 25%), Down syndrome (6 patients, 10%), and cerebral palsy (2 patients, 3%) (Table 1). In the care group, there were 39 male and 22 female patients with an average age of 35.6 ± 10.8 (Table 1). Complicating diseases were intellectual disability (53 patients, 86%), epilepsy (28 patients, 45%), autism (16 patients, 26%), Down syndrome (5 patients, 8%), and cerebral palsy (3 patients, 4%) (Table 1). The details of the dental procedures were compared statistically between the two groups. The investigation items were frequency of dental procedures while conscious and while under ambulatory general anesthesia, number of tooth extractions and pulp extirpations, and frequency of root canal treatment and filling dental caries.

Table 1. Characteristics of each group. (There was no significant difference between groups).

	Cure group	Care group
Case number	58	61
Sex (Male : Female)	36:22	39:22
Age (year) mean \pm SD	35.2 ± 10.3	35.6 ± 10.8
Complicating	Mental retardation	
	51	53

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disease	Epilepsy	28	28
	Autism	15	16
	Down syndrome	6	5
	Cerebral palsy	2	3

Statistical Analysis

Numbers were calculated as per year. Statistical analysis between the two groups was performed by the Mann-Whitney U-test, and $p < 0.05$ was considered significant.

Results

In the cure group, the frequency of procedures while conscious and while under ambulatory general anesthesia was 1.6 ± 0.7 times/year and 2.7 ± 0.3 times/year, respectively. The number of tooth extractions and pulp extirpations was 1.8 ± 0.3 teeth/year and 0.9 ± 0.2 teeth/year, respectively. The frequency of root canal treatment and filling dental caries was 1.5 ± 0.4 times/year and 5.3 ± 0.7 times/year, respectively (Figure 1).

In the care group, the frequency of procedures while conscious and while under ambulatory general anesthesia was 1.0 ± 1.2 times/year and 1.6 ± 0.3 times/year, respectively. The number of tooth extractions and pulp extirpations was 0.2 ± 0.1 teeth/year and 0.1 ± 0.1 teeth/year, respectively. The frequency of root canal treatment and filling dental caries was 0.1 ± 0.1 times/year and 1.8 ± 0.6 times/year, respectively (Figure 1).

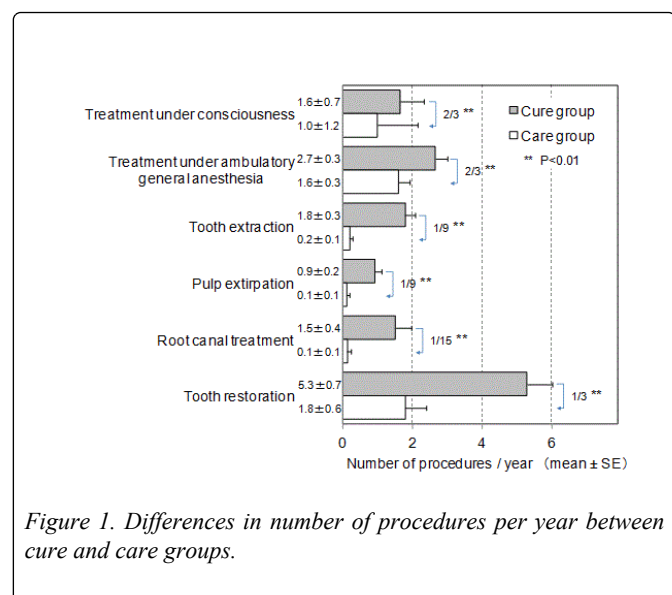


Figure 1. Differences in number of procedures per year between cure and care groups.

There were significant differences ($p < 0.01$) in the frequency of dental treatment while conscious and while under ambulatory general anesthesia, the number of tooth extractions and pulp extirpations, and the frequency of root canal treatment and filling dental caries (Figure 1). The frequency of dental treatment while conscious and while under ambulatory general anesthesia in the care group was significantly lower (2/3) than in the cure group. The number of tooth extractions and pulp extirpations in the care group was significantly lower (1/9) than in the cure group. The

frequency of root canal treatment in the care group was significantly lower (1/15) than in the cure group. The frequency of filling dental caries in the care group was significantly lower (1/3) than in the cure group.

Discussion

It is very important for patients with intellectual disabilities to continue daily oral care such as tooth brushing, but it is not easy [1]. Even for the 119 subjects of this study, it was too difficult to brush their teeth every day at each home or facility because of their marked lack of cooperation.

The results of this study indicate that periodic oral care under ambulatory general anesthesia for severe intellectual disability patients who cannot undergo dental procedures while totally conscious significantly decreased the frequency of dental treatment while conscious and while under ambulatory general anesthesia, the number of tooth extractions and pulp extirpations, and the frequency of root canal treatment and filling dental caries. The number of tooth extractions and pulp extirpations decreased to approximately 1/9 by periodic oral care under ambulatory anesthesia. As a reason, it was suggested that patients who did not receive periodic oral care under general anesthesia tended to have their incipient dental caries and periodontal disease overlooked. In patients with intellectual disabilities who strongly refuse treatment, dental caries and periodontal disease can deteriorate easily if such patients do not undergo periodic oral examination, professional tooth cleaning, scaling, and filling incipient dental caries [3]. The late detection of dental caries and periodontal disease due to late inspection after the appearance of symptoms results in an increased frequency of tooth extraction, root canal treatment and prosthesis procedures. Consequently, the frequency of invasive procedures, procedures under general anesthesia, and medical expenses increase. If patients with intellectual disabilities lose their teeth, it is almost impossible to apply prostheses such as an oral implant, bridge or denture because of poor oral hygiene [4]. Therefore, the occlusal condition and masticating function deteriorate, which can easily have a negative effect on their nutritional status [5]. In contrast, patients with intellectual disabilities who undergo biannual periodic oral care under ambulatory general anesthesia receive preventive care by the early detection of incipient dental caries. Accordingly, they require only simple composite resin fillings. Since patients with intellectual disabilities who are markedly uncooperative almost always cannot brush their own teeth and do not allow helpers to brush their teeth [3], biannual periodic oral care such as professional tooth cleaning or scaling is a good opportunity to remove the accumulated hard dental calculus and plaque thoroughly. Therefore, periodic oral care under ambulatory general anesthesia is effective for patients with intellectual disabilities who strongly

refuse treatment. Kovacic et al [6]. reported that improvident tooth extractions were performed generally for patients with intellectual disabilities in the 1980s, although conservative tooth treatments for such patients have been occurring recently. However, they suggested that preventive dental care for patients with intellectual disabilities is still not highly developed. The results of this study will help to solve these problems.

The deaths of 126 patients associated with dental procedures were assessed [7]. Asphyxia was the major cause of death (21%), and it most frequently occurred in children or patients with intellectual disabilities undergoing a dental procedure with a mouth prop and body restraints [7]. Shimamura [8] and Ogasawara[9] reported that arterial oxygen saturation decreased significantly when pediatric or intellectual disability patients were treated using a mouth prop and body restrainer. Ito [10] reported that the upper airway diameter decreased to half after using a mouth prop, followed by significant dyspnea. Yagi [11] reported that body restraint of only 25mmHg significantly harms the respiratory and circulatory condition in rabbits. These reports suggest that dental procedures using a mouth prop and body restraints are risky in patients with intellectual disabilities.

Recently, intubated general anesthesia has become safer, as marked progress in drugs, monitoring, equipment, and technology has been made. From the 1950s to 1990s, the mortality caused by general anesthesia plummeted from 1/2,860 to 1/400,000 [12,13]. Mortality caused by local anesthesia is approximately 7 times higher than that caused by general anesthesia [14]. These reports mean that the current general anesthesia is sufficiently safer than local anesthesia under body restraint treatment. In particular, minimally invasive periodic oral care under ambulatory general anesthesia for patients who strongly refuse treatment is more effective.

Moreover, patients with intellectual disabilities who undergo biannual oral care under ambulatory general anesthesia gradually tend to get used to visiting our hospital and enter the treatment room without hesitation. Conversely, in patients with intellectual disabilities who visit our hospital after the appearance of a symptom such as intense pain, resistance to entering our hospital and treatment room tends to be strong [15].

Conclusions

For patients with intellectual disabilities who strongly refuse treatment, periodic biannual oral care (professional tooth cleaning, scaling, and filling incipient dental caries) under ambulatory general anesthesia is effective to maintain their occlusal health. It also can reduce the frequency of invasive procedures as well as medical expenses.

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