

Children Oral Health Following Treatment under General Anesthesia: A Retrospective Study

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Abstract

Introduction: Dental treatment for children can be provided and completed in dental chair using one or more behavior management methods applied in dentistry. When these methods did not work, special behavior management technique such as treatment under general anesthesia (GA) may be provided for optimal dental treatment. The purpose of this study was to evaluate long term oral health status such as oral hygiene (OH), recall rate, behavior changes and development of new or recurrent carious lesions in children who received dental treatment under GA.

Methods: Data were collected retrospectively from dental records of 433 children who received dental treatment under GA between 2006 and 2010. Collected data looked at 1) Age, 2) Gender, 3) OH before treatment and at the recall visits, 4) Behavior changes, 5) New or recurrent caries experience, and 6) Treatment of these lesions.

Results: Age of patients ranged between 2 and 13 yrs. Boys to girls were 223 (51%) to 210 (48%) respectively. OH post operatively was significantly improved in comparison to that before treatment (p -Value < 0.0001). However, OH was almost the same among patients who attended recall visits (p -Value = 0.79). Number of patients who attended recall visits reduced significantly by time (p -Value < 0.0001). There was significant improvement in patient cooperation post operatively in comparison to that pre-operatively (p -Value < 0.0001). There was no significant difference in the incidence of new or recurrent carious lesions through recall visits (p -Value = 0.73).

Conclusion: Dental treatment under GA did not seem to be effective in the improvement of OH or in reducing caries experience. However, children behavior showed some improvement in the follow up visits due to no active treatment required or simple dental procedures may be implemented.

Introduction

Dental treatment for children can be provided and completed in dental chair using one or more behavior management methods applied in dentistry [1,2]. For minority of children, however, special behavior management technique such as treatment under GA may be provided for optimal dental treatment [2]. The advantage of treatment under GA is that all necessary treatment can be completed during a single visit and under minimal distress to the patient, parents and dentist [2]. However, dental treatment under GA is considered to be the treatment of choice when other methods failed or not conceivable due to: mental, physical, or medical disability; extremely uncooperative children and those who require comprehensive dental care [3]. It has been reported that dental treatment

under GA have shown significant improvement in the oral health, psychological, and social status of the children and their families [4]. However, special consideration in preventive maintenance program and an appropriate follow-up regime for these children is compulsory [4].

The purpose of the present study was to evaluate long term oral health status (recall rate, OH maintenance, new carious lesions and behavior changes) for children who received dental treatment under GA. This study hypothesized that children treated under GA may have optimal recall rates, good OH and less future caries experience.

Methods

Data were collected retrospectively from the dental records of 433 patients classified as ASA I & ASA II according to the American Society of Anesthesiology [5]. All patients received dental treatment under GA at Dental Centre in Riyadh Medical Complex (Riyadh, Saudi Arabia) between 2006 and 2010. Collected data were looked at: 1) Age, 2) Gender, 3) OH one week post operatively and at recall visits, 4) Behavior changes, 5) Development of new or recurrent carious lesions and 6) Treatment of these lesions. The follow up recall visits were every three to six months following completion of the treatment.

Chi square analyses were implemented on the collected data when stratified on the basis of behavior towards dentistry following dental rehabilitation, OH post dental rehabilitation, routine dental recall visits and the development of new carious lesions.

Results

Age of patients ranged between 2 and 13 yrs with 223 boys (51%) and 210 girls 210 (48%). From the 433 patients who received treatment under GA, three hundred and sixty three patients (84.5%) were classified as ASA I while the remaining 70 patients (15.5%) were considered as ASA II. The reasons for referring patients to be treated under GA is summarized in Table 1.

Table 1: Distribution of Patients According to the Reasons for Referral

Reason for Referral of All Patients	Number of Patients (%)
Behavior problems	151 (34.9)
Extensive work needed	121 (27.9)
Behavior problems and extensive work needed	161 (37.2)
Total	433 (100)

Distribution of patients according to the number of decayed teeth, dental restorations and extractions received were summarized in Table 2.

Table 2: Distribution of Patients According to the Number of Decayed Teeth per Patient, Restorations and Extractions Received

Number of decayed teeth per patient that required restorations or extractions	Number of patients had restorations (%)	Number of patients had dental extractions (%)
≤5	94 (21.7)	309 (71.3)
6-10.	198 (45.7)	89 (20.6)
> 10	141 (32.6)	35 (8.1)
Total	433 (100)	433 (100)

The majority of patients presented post operatively with either fair OH (51%) or poor OH (32.4%) (Table 3). However, OH post operatively was significantly improved in comparison to that before treatment (p-Value < 0.0001). OH was almost the same among patients who attended recall visits with fair OH in most cases (p-Value = 0.79) (Table 3) (Figure 1). Furthermore, the number of patients attended recall visits decreased significantly by time (p-Value < 0.0001) (Table 4) (Figure 2).

Table 3: Oral Hygiene Level before Treatment, One week Post-operative and at Recall Visits

OH Status	Number of Patients Pre-GA (%)	Number of Patients Post Operatively (%)	Number of Patients at 1st Recall (%)	Number of Patients at 2nd Recall (%)	Number of Patients at 3rd Recall (%)	Number of Patients at 4th Recall (%)
Poor	374 (86.4)	117 (32.4)	52 (29.7)	24 (23.5)	23 (29.9)	18 (26.2)
Fair	56 (12.9)	184 (51)	103 (58.9)	69 (67.7)	44 (57.1)	40 (60)
Good	3 (0.7)	60 (16.6)	20 (11.4)	9 (8.8)	10 (13)	9 (13.8)
Total	433 (100)	361 (100)	175 (100)	102 (100)	77 (100)	67 (100)

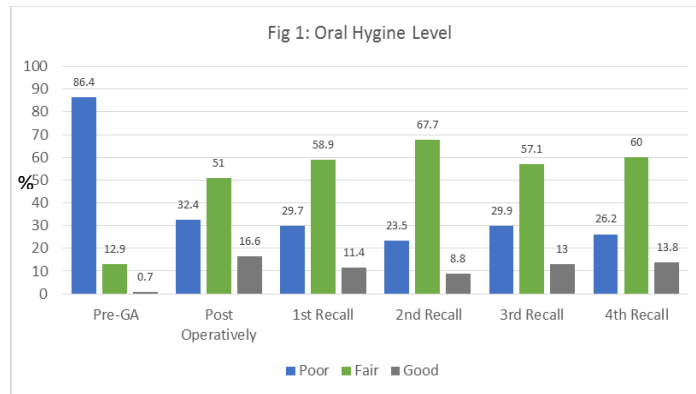


Figure 1: Oral Hygiene Level

Table 4: Distribution of Patients According to the Attendance for Recall Visits

Patients' Attendance	Number of Patients post operatively (%)	Number of Patients at 1st recall (%)	Number of Patients at 2nd Recall (%)	Number of Patients at 3rd Recall (%)	Number of Patients at 4th Recall (%)
Attended	361 (83.40)	175 (40.4)	102 (23.6)	77 (17.8)	67 (15.5)
Did not attend	72 (16.60)	258 (59.6)	331 (76.4)	356 (82.2)	366 (84.5)
Total	433 (100)	433 (100)	433 (100)	433 (100)	433 (100)

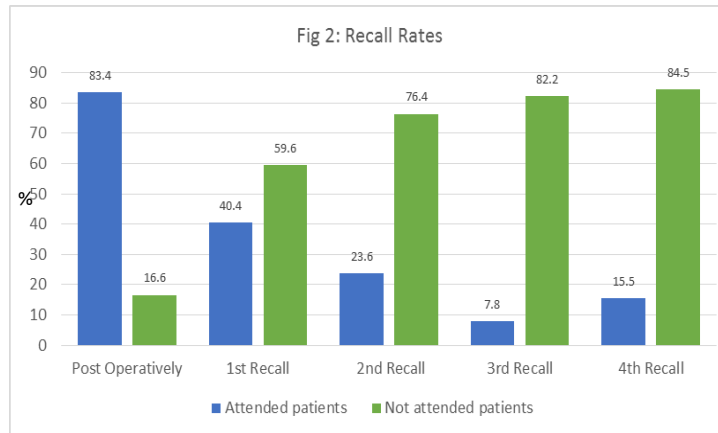


Figure 2: Recall Rates

Behavior level of children was relatively positive post operatively. However, there was no significant difference in cooperation of the patients before and after treatment (p-Value 0.59) (Table 5) (Figure 3).

Table 5: Behavior Levels Before Treatment under GA and at Recall Visits Following Treatment

Behavior Level	Number of Patients Before GA (%)	Number of Patients at 1st Recall (%)	Number of Patients at 2nd Recall (%)	Number of Patients at 3rd Recall (%)	Number of Patients at 4th Recall (%)
Cooperative *	118 (27.3)	131 (74.9)	79 (76.7)	57 (74)	50 (74.6)
Uncooperative	315 (72.7)	44 (25.1)	24 (23.3)	20 (26)	17 (25.4)
Total	433 (100)	175 (100)	103 (100)	77 (100)	67 (100)

* Patients were referred due to extensive work needed

There was no significant difference in the development of new lesions and recurrent carious lesions noticed during recall visits (p-Value = 0.73) (Table 6). Furthermore, no significant differences were found in the type of treatment received (either restorations or

extractions) in the recall visits (p-Value = 0.3). Dental treatment received during recall visits for new or recurrent lesions was performed by utilizing behavior management methods only.

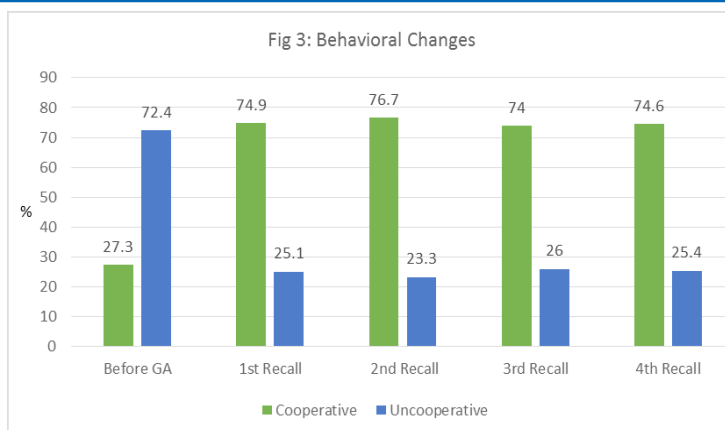


Figure 3: Behavioral Changes

Table 6: Distribution of Patients According to the Type of Caries Lesions at Recall Visits

Caries Lesions	Number of Patients in the 1st Recall (%)	Number of Patients in the 2nd Recall (%)	Number of Patients in the 3rd Recall (%)	Number of Patients in the 4th Recall (%)
New Caries	19 (34.5)	20 (42.6)	13 (31)	8 (32)
Recurrent Caries	33 (60)	24 (51.1)	24 (75.1)	15 (60)
New and Recurrent Caries	3 (5.5)	3 (6.4)	5 (11.9)	2 (8)
Total	55 (100)	47 (100)	42 (100)	25 (100)

Discussion

The majority of children are able to receive dental treatment in a conventional setting, however, some patients do not co-operate with the usual behavior management techniques. Therefore, these children will be treated under GA [4]. The purpose of dental treatment under GA is to restore optimal oral health in a single visit and prevent anxiety associated with multiple dental chair visits for unco-operative patients and patients require extensive dental work [6].

The importance of follow up visits is crucial for the children and their caregivers to maintain good OH, providing dietary advice and instructions to prevent future dental decay [6]. The success of this approach is highly relies on subsequent follow up visits. Compliance in attending one week visit following dental rehabilitation under GA is relatively high in comparison to the compliance in attending subsequent recall visits [7]. The present study has similar results of a previous study done in Saudi Arabia by Al-Malik and Al-Sarheed (2006) that revealed most of the patients attended post dental rehabilitation visit (83%) but only 26% and 15.5% (present study) attended for regular follow up visits following dental treatment under GA [8]. Failure of regular attendance to dental office results in further need for dental treatment and possible need for a second dental rehabilitation under GA. Therefore, the clinical outcome of treating dental caries alone without identifying the underlying risk factors for developing new dental lesions will fail. Hence, the pediatric dentists are required to provide appropriate dental treatment plan discussed with the caregivers and the importance of regular follow up visits [6]. Regrettably the caregivers in the present study were not aware of the importance of recall visits

regularly that may explain high incidence of recurrent caries and poor OH.

Reinforcement of maintaining good OH at the recall visits will improve quality of life of children and reduce the need for future treatment. In addition, caregivers must be motivated enough to follow up preventive program at home to avoid new carious lesions and further dental treatment [1]. However, the present study showed that dental treatment under GA did not enhance good OH or reduce caries experience.

Children behavior showed some improvement in the follow up visits. The improvement in their attitude may be due to no active treatment required or simple dental procedures may be performed. However, all dental treatments provided at the recall visits were done without local anesthesia (LA) if the caries lesions were superficial or under LA utilizing behavior management techniques.

In the present study, OH evaluation and evaluation of restorations were done by different dentists over a period of four years following dental rehabilitation that made their assessments subjective. In addition, type of dental restorations implemented under GA was not evaluated that may affect the longevity and successful rate of the treatment provided. The outcomes of evaluation OH status, type and quality of restorations and regular attendance of the patients to the dental office following dental rehabilitation by the same evaluators are more reliable (prospective study).

Conclusion

Dental treatment under GA did not seem to be effective in the im-

provement of OH or in reducing caries experience. Nevertheless, children behavior showed some improvement in the follow up visits due to no active treatment required or simple dental procedures may be implemented. Caregivers did not seem to be attentive on the importance of keeping good OH and visit dentist regularly.

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