

Characteristics of Children Undergoing Dental Treatment under General Anesthesia

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ABSTRACT

Objective: This retrospective study was carried out to describe the characteristics of children undergoing dental treatment under general anesthesia in relation to age, gender, health status and to assess the indications and the type of dental procedures based on records received at Prince Hashem Hospital Zarka City.

Methods: Records of children who were treated under general anesthesia between July 2007 and July 2009 were reviewed and the data collected included age of patients at time of treatment, gender, medical status, indication for treatment under general anesthesia, and type of procedure.

Results: A total of 128 patient records were available for the present study out of a total of 145 child patients; some of the required data were not completely available for the study. There were 69 (53.9%) males and 59 (46.1%) females. The age range of children was between 2-14 years with the mean age of 6.3 years. The most common indication for treatment under general anesthesia was lack of cooperation of children for dental treatment in the dental clinic (50.8 %) followed by presence of extensive dental caries (26.5%). Medically compromised patients (17.2 %) formed the next group and included patients with syndromes, cardiac diseases, autism and achondroplasia. Most of the cases had dental restorations and extractions and few cases were admitted for surgical procedures

Conclusion: It was concluded that lack of cooperation of children was the main indication for having dental treatment under general anesthesia and this option was very helpful for this group of patients. The main procedures carried out were dental restorations and extractions.

Key words: General Anesthesia, Children, Dental Treatments

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Introduction

In many developing countries, caries prevalence has been found to be significantly high. Jordan is one of these countries with caries prevalence in preschool children ranging from 48 to 67%.^(1,2) Caries has been reported as the main reason for extraction of teeth.⁽³⁾

Not all children with caries can be managed with normal behavioral management techniques in the dental clinic, so pediatric dentists

sometimes use pharmacological techniques to manage these children. These include: deep sedation, conscious sedation and general anesthesia. General anesthesia was defined by American Academy of Pediatric dentistry as "induced state of unconsciousness accompanied by partial or complete loss of protective reflexes".⁽⁴⁾ This valuable option can provide comprehensive dental care for pediatric patient in a single visit and immediate relief of dental pain.⁽⁵⁻⁹⁾

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Table I. Patients Age/Gender Distribution

Age Group (years)	Male	Female	Total	%
2 – 4	18	22	40	31.25
5 – 7	32	16	48	37.50
8 – 10	9	10	19	14.84
More than 11	10	11	21	16.41
Total	69 (53.9%)	59 (46.1%)	128	100

Table III. Health Status of the Children

Health Status	No. of Children	%
Healthy	106	82.81
Mental Retardation Syndromes	10	7.81
Seizure Disorders	8	6.25
Autism	2	1.56
Achondroplasia	1	0.78
	1	0.78

Table II. Children Distribution per Indication for G.A

Indication for G.A	No. of Children	%
Lack of cooperation	65	50.8
Extensive Caries for Young Child	34	26.5
Medically Compromised	22	17.2
Surgical Procedure	7	5.5
Total	128	100

Table IV. Treatment Type Distribution

Treatment Type	Permanent teeth	Primary teeth
Fissure Sealant and Fluoride	57 (34.76%)	25 (3.12%)
Amalgam restoration	14 (8.54%)	82 (10.22%)
Composite restoration	30 (18.29%)	41 (5.11%)
Compomer restoration	24 (14.63%)	113 (14.09%)
Glass Ionomer Cement restoration	7 (4.27%)	109 (13.59%)
Stainless Steel Crown	-	17 (2.12%)
Pulp treatment	-	85 (10.60%)
Extraction	32 (19.51%)	330 (41.45%)
Total	164	802

There are many indications for treatment of children under general anesthesia other than extensive dental caries. General anesthesia is also indicated for anxious children who cannot be managed with traditional behavioral management techniques and local anesthesia.⁽¹⁰⁾ Behavior management of children in the dental clinic is one of the most challenging problems faced by pediatric dentists.⁽¹¹⁾ Despite the advances made over the last few decades in the delivery of dental care and improved pain management, dentistry remains feared by a great number of persons.⁽¹²⁾ Some children are able to cope well with potentially stressful situations, such as a visit to the dentist; other children, however, are more vulnerable to their fears and impulses, and hence more prone to react with emotional or behavioral symptoms.⁽¹³⁾

Patients with special needs and those with medical problems can also benefit from treatment under general anesthesia in a single visit. The goals in the pediatric dental patient care are to eliminate cognitive, sensory and skeletal motor activities to facilitate the delivery of good quality comprehensive dental services.⁽⁴⁾

The aims of this retrospective study were to investigate indications, the type of dental treatment provided for children and to determine the characteristics of the patients treated under general anesthesia at a military hospital in Zarqa City (Jordan) in the two years period between July 2007 and July 2009.

Methods

The records of children who were treated under general anesthesia at Prince Hashem Hospital in Zarqa were reviewed, over the period from July 2007 and July 2009. The data collected from dental records included the age of the patients at time of treatment, gender, and indications for dental treatment under general anesthesia, type of treatment provided and medical history of children.

Children referred for treatment were mainly from general dental practitioner's clinics. All referred cases were examined by a certified pediatric dentist who formulated treatment plans for the patients.

Following medical clearance regarding patients' fitness for general anesthesia, the

anticipated treatment was explained to the parents and the consent to operate was signed. Verbal and written instructions were given to parents, to ensure nothing by mouth from midnight on the day before, and early attendance on the day of treatment. The medically compromised patients were examined and referred to the specialty consultant anesthetist for pre-anesthetic assessment.

All patients were reviewed one week after treatment, when data were analyzed using simple descriptive statistics.

Results

Out of the 145 records of the child dental patient, 128 were available for this study. Just over half were males (53.9%) and 46.1% were females. Patients' age ranged from 2 to 14 years, with a mean age of 6.3 years. Patients were categorized into four age ranges as shown in Table I. Majority of patients were in the 5 to 7 years old group (37.5%) whereas the smallest group was the 8 to 10 years old (14.8%).

Regarding the patients indications for the treatment under general anesthesia, the most common indication was lack of cooperation of children (50.8%), whereas only 5.5% of reviewed children were treated for surgical procedures. (Table II)

The majority of the children were considered healthy. Table III illustrates the medical conditions of the patients reviewed.

The average number of carious deciduous teeth among the children was five with a range from one to 14. There were a total of 164 treated permanent teeth, and total of 802 treated primary teeth. Table IV illustrates the treatment type for both dentitions. A total of 330 primary teeth were extracted in contrast to 32 permanent teeth extracted.

For the permanent teeth, majority of treatment was preventive (34.76%) while only 4.27% of them were treated by glass ionomer cement. On the other hand, majority of the primary teeth were treated by compomer and glass ionomer cement, and only 2.12% of them were treated by applying stainless steel crowns.

Discussion

The results of this study showed that in general

the characteristics of patients who were treated under general anesthesia in Prince Hashim Bin Al-Hussein Hospital in Zarqa were mostly males (53.9%) while females were 46.1% as shown in Table I. The largest group treated under general anesthesia was the five to seven year olds (37.5%) which is considerably more than the smallest group eight to 10 year olds (14.8%). The larger number in the former group is similar to the findings in other studies.⁽¹⁴⁻¹⁵⁾ This result could be explained by the fact that children in this age group are unable to adapt to dental treatment under local anaesthesia.⁽⁸⁾ This also may be partially explained by that the great number of patients' referrals and the waiting lists are mostly in this age group. Oral hygiene and dietary practices may be also counted as additional factors in comparison with the other age groups.⁽¹⁶⁻¹⁷⁾ On the other hand, only 14.8% patients were between eight to 10 years old, this may be related to several factors. One factor may be that the high caries prevalence at an early age might have resulted in corresponding increase in demand for general anesthesia facilities at earlier stages⁽¹⁸⁾ thus obviating the need for treatment later on. Also, as children mature, most of them are better able to cope with dental treatment at the dental chair without the need for general anesthesia.⁽¹⁹⁾

Looking at the patients' indications for the treatment under general anesthesia, as shown in Table II, the most common indication was lack of cooperation which forms 50.8% and extensive caries which forms 26.5%. This is in agreement with other reports.^(8,20)

The uncooperative, high caries risk children pose a demanding challenge to pediatric dentists.⁽²¹⁾ Some children had more than one reason for treatment under general anesthesia, and some of the uncooperative and very young children also had extensive dental caries. These findings are consistent with results described by other investigators.^(9,22,23) An important consideration for children who are unable to cooperate due to fear, anxiety or young age is their subsequent acceptance of care using other methods with low risk and low impact. The aim in using general anesthesia is to restore the child's oral health at a single visit allowing behavior modification methods to be introduced more readily afterwards.^(14,24,25) In this study,

surgical procedures were only performed for 5.5% of children.

Regarding the health status of the patients, 82.8% were medically healthy, whilst only a minority of the patients had medical problems. These included one case of autism and one case of achondroplasia, as shown in Table III.

As for the treatment types that were performed to the patients, it was noticed that there were a total of 164 treated permanent teeth, while the treated primary teeth were 802, as shown in Table IV. Untreated dental caries is a disease that usually progresses with time resulting in severe destruction of tooth enamel and dentine, and it may subsequently involve the pulp. Nevertheless many children with gross caries present with no or very little apparent history of pain, or if dental problems develop early, such as early childhood caries, the child may have no experience of teeth feeling any other way.⁽²⁶⁾ Furthermore, lack of knowledge regarding importance of primary teeth,⁽²⁷⁾ and some parents' perception that children visit the dentist only at time of emergency or when there is pain may have contributed to the severity of caries in those children.⁽²⁸⁾ From this table also, it was noticed that a total of 330 primary teeth were extracted, in contrast to 32 permanent teeth that were extracted.

In the present study, primary teeth comprised the major bulk of extraction, which is similar to a study by Holt *et al.*⁽⁷⁾ Although dental extractions in young children can cause eruption problems of permanent teeth due to space loss, in pediatric dental practice extraction of primary teeth is quite common generally due to advanced caries and pulp involvement.⁽²⁾

In the present study, extractions of primary teeth are common and very high which reflects a high caries rate and untreated caries, and children not visiting a dentist on regular basis for early checkup and dental care as seen also in other studies.⁽²⁹⁾

Regarding the type of treatment performed for the teeth treated under general anesthesia as shown in Table IV, it was noticed that 34.76% of permanent teeth were treated by applying fissure sealant and fluoride varnish 5% application (as part of preventive measures). The problem of high percentage of caries in children was due to

the prolonged lack of prevention for the uncooperative child. Hence, early assessments of high caries risk subjects and primary prevention before the onset of caries is the key in reducing the number of high caries patients⁽³⁰⁻³¹⁾ and this should be emphasized in dental care for all children. Only 4.27% of permanent teeth were treated by applying glass ionomer cement.

Conclusion

It was concluded that patients treated under general anesthesia were mostly males, with the majority of them being five to seven years old. Lack of cooperation of children was the main indication for having dental treatment under general anesthesia and this option was very helpful for this group of patients. The main procedures carried out were dental restorations and extractions

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