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The Most Common Treatment Under General Anaesthesia In Hospital Usm: A Paediatric Case Study From 2015 To 2018

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ABSTRACT

Introduction: General anaesthesia (GA) dental care is one of the clinical strategies used to treat non-cooperative those, patients with chronic medical problems or with specialised and comprehensive treatment by some paediatric dentists. ***Objective:*** The purpose of this retrospective research was to analyse cases of general anaesthesia in paediatric dentistry at Hospital Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan. ***Methods:*** A total of 298 patients reports were collected for data processing from 2015 to 2018. ***Results:*** About 54% of patients in the Malay ethnic community were male and the mean age was 5 years. The highest treatment is on the fissure sealant restoration, 100(33.6%) and follows by extraction of deciduous teeth 218(73.2%). The lowest treatment was found in Sandwich Technique Restoration 1(0.3%), excision of chronic mucocele, which is about 2(0.7%), and the treatment based on GIC Fuji IV 2(0.7%). The next analysis is focusing on the type of treatment. The result from multiple responses shows that patients with a combination of three treatment having 61%, this is the highest percentage. While patients with four types of treatment are the second highest, 59 cases or 25.4% and the third highest comes from the category of patients with two types of treatment. ***Conclusion:*** An annual rise in referred cases for dental care under GA has been observed. it is believed that the number of patients receiving dental treatment under GA is likely will continue to show an upward trend, and for the specific finding it was found that the extraction deciduous teeth are the highest case which is about 31.2%, fissure sealant restoration about 14.3% and stainless steel crown which is 13.3%.

Keywords: Paediatric Dentistry, General Anaesthesia (GA), Multiple Response.

1. INTRODUCTION

Paediatric dentistry is a special health care speciality that offers preventative dental care for both babies and adolescents into puberty, and (for those that have a special need) also provides preventive- or restorative-dentistry for those who have children with special needs. Dental care can include the replacement of teeth, extraction or surgical removal of undesirables which cannot be replaced, as well as teeth scaling to avoid periodontal problems. In children, these procedures are often associated with a significant amount of pain, and anxiety, which sometimes require pharmacological behaviour management. Therefore, many patients chose to undergo GA to alleviate stress and improve

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the comfort of treatment (Nick et al., 2003), while some patients undergo GA due to age, maturity, or physical or learning disability due to lack of cooperation (Nick et al., 2003; Al Badri et al., 2006). The most frequent condition of kids with dental caries is serious. Such diagnoses include the pathology of soft or hard tissue that involves mild oral surgery that has to be performed under GA. These cases require surgical replacement of the infected tooth or teeth, soft tissue excision biopsy, or others.

Dental care under general anaesthesia can be categorized into three major categories that are outpatient 'short case' dental chair anaesthesia, outpatient 'day stay' intubation anaesthesia, and inpatient 'hospital stay' intubation anaesthesia (Meechan et al., 1993). Due to limited resources, only in-patient 'hospital stay' has been practised since USM Hospital. The general anaesthesia service was given at Hospital USM, in which the patient had to spend their time in the observation ward before the surgical operation. Initially, staff nurses ought to be seen by all paediatric patients. However, if the patient is found to be uncooperative or has any medical conditions upon examination, the dental officer will be referred to the patient. When the dentist has the patient, he or she will later send the patient to a paediatrician for a follow-up. The patient will undergo a full consultation from the surgeon and psychologist. The paediatric specialist would also take the necessary history and review, especially for medical conditions. Next, the parents will be informed about the detailed procedure and also the proposed treatment plan. Parents will now be told of their children's GA date and will request an admission form with a telephone number to call them if they want more details or to postpone general anaesthesia if the infant falls sick before or on the day of admission to the ward.

2. DATA AND METHODS

2.1 Population and Sample

This study is a retrospective review study of cases of dental treatment under general anaesthesia (GA) among paediatric patients in Hospital USM. The study site was at the Paediatric dental specialist clinic and Record Unit Centre of Hospital USM, Kubang Kerian, Kelantan. 369 patients participated in this research. Table 1 summarize the data description of the selected variable in the study.

Table 1. Data Description of the selected variable in the study

Num.	Variables	Explanation variables
1.	Age	Age in years
2.	Gender	Patient Gende, 1= Male, 2= Female
3.	Full_Mo_Scal	Full Mouth Scaling
4.	Fissure_Seal_Rest	Fissure Sealant Restoration
5.	Fissure_Prot	Fissure Protection
6.	PRR	Preventive Resin Restoration
7.	Strip_Crown	Strip Crown
8.	SSC	Stainless Steel Crown
9.	RMGIC	Resin Modified Glass Ionomer Cements
10.	GIC_Fuji_IV	GIC FujiIV
11.	GIC_Fuji_IX	GIC FujiIX
12.	GIC_Fuji_II	IC FujiII
13	Sandwich_Tech_Res	Sandwich Technique Restoration
14	CR	Composite Resins
15	Amalgam	Amalgam
16	Fluoride_Duraphat	Fluoride Duraphat
17	Full_Mo_Flu_Varn	Full Mouth Fluoride Varnish
18	Exc_of_Chro_Muc	Excision Of Chronic Mucocele
19	Extr_Deci_Teeth	Extraction Deciduous Teeth
20	Extr_Perm_Teeth	Extraction Permanent Teeth

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2.2 Multiple Response Analysis and Crosstabulation Analysis

In this segment, two statistical methods were used to evaluate the dataset. The first statistical approach was multiple response analysis and the second was crosstabulation statistical analysis. The multiple response frequencies procedure produces a frequency table for multiple response sets. Through the multiple response analysis, we can obtain information on the most frequent treatment used. The percentage across the treatment will be given, the highest percentage showing the most used in the study while the lowest percentage of the study indicate the less used in the study. The second analysis is based on the crosstabulation section. The cross-tabulation study is structured to be focused on the gender dimension. Eighteen therapies were described and tabulated by male and female. This is to gain full knowledge based on the gender element.

3. RESULTS

Bar chart analysis for the patient frequency according to the year

The first section is the result which gains from the descriptive statistic and multiple response analysis for the type of treatment.

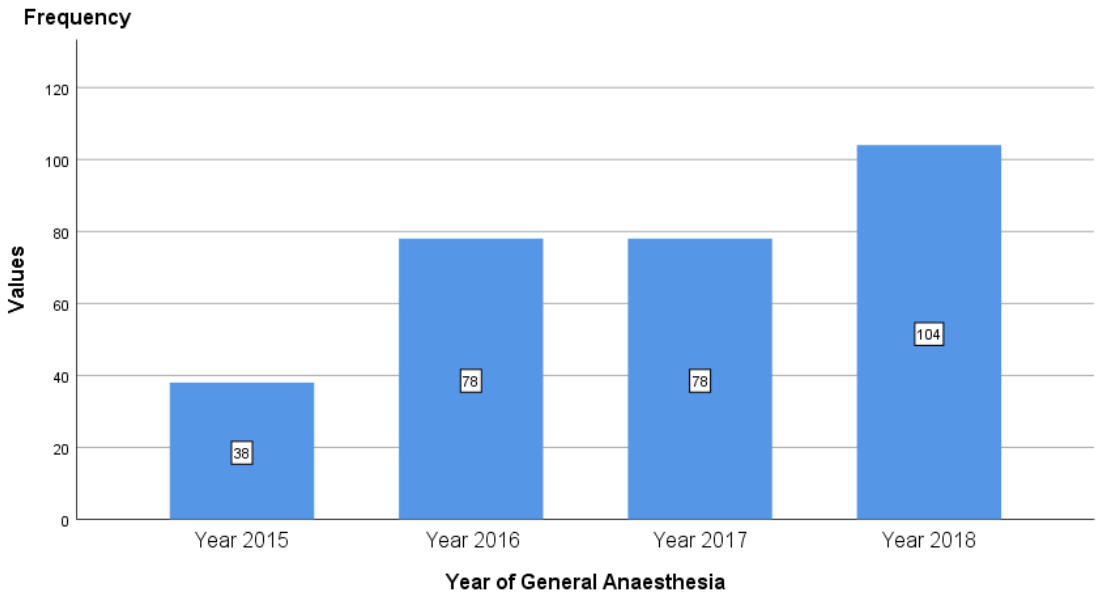

Figure 1. Frequency of Patient According to Year

Figure 1 shows the number of patients according to the year. In the year 2015, there were 35 cases reported under general anaesthesia for further treatment. The number of patients doubled in 2016 relative to 2015. Similar to the year 2017, the number of patient under general anaesthesia remains the same. However, the number increases gradually in the year 2018 up to 104 cases.

The Multiple Response Analysis

Table 2. Patients summary with the type of treatment

Patients with Treatment	Case (%)
Patients with one type of treatment	36(15.5)
Patients with two types of treatment	47(20.3)
Patients with three types of treatment	61(26.3)
Patients with four types of treatment	59(25.4)

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Patients with five types of treatment	23(9.9)
Patients with six types of treatment	5 (2.2)
Patients with seven types of treatment	1(0.4)

Table 2 shows the summary of patients with the type of treatments. The highest percentage is in Table 2 which is given by 61%, patients with three types of treatments. Patients with four types of treatment are the second highest, 59 cases or 25.4%. While the third-highest comes from the category of patients with two types of treatment. This shows that most of the patients under general anaesthesia having a treatment combination of more than two.

Table 3. The most common treatment under general anaesthesia

Treatment Type	Cases(%)
1. Full Mouth Scaling	2.9%
2. Fissure Sealant Restoration	14.3%
3. Fissure Protection	1.6%
4. Preventive Resin Restoration	4.4%
5. Strip Crown	0.6%
6. Stainless Steel Crown	13.3%
7. Resin Modified Glass Ionomer Cements	3.9%
8.GIC FujiIV	0.3%
9. GIC FujiIX	1.6%
10.IC Fuji II	2.7%
11.Sandwich Technique Restoration	0.1%
12.Composite Resins	11.8%
13. Amalgam	2.1%
14. Fluoride Duraphat	3.9%
15. Full Mouth Fluoride Varnish	1.1%
16. Excision of Chronic Mucocele	0.3%
17. Extraction Deciduous Teeth	31.1%
18. Extraction Permanent Teeth	4.1%

Table 3 indicates the most popular general anaesthesia procedure from 2015 to 2018. Extraction Deciduous Teeth were the highest case with nearly 31.1%, Fissure Sealant Replacement with 14.3% and Stainless Steel Crown with 13.3%. The complete result is seen in Table 3.

Table 4. The most common treatment under general anaesthesia among male

Type of Treatment	Cases(%)
1. Full Mouth Scaling	2.8%
2. Fissure Sealant Restoration	14.4%
3. Fissure Protection	1.8%
4. Preventive Resin Restoration	4.6%
5. Strip Crown	0.5%
6. Stainless Steel Crown	13.7%
7. Resin Modified Glass Ionomer Cements	3.1%
8. GIC Fuji IV	2.1%
9. GIC Fuji IX	3.4%
10. IC Fuji II	0.3%
11.Sandwich Technique Restoration	10.3%
12.Composite Resins	2.6%

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13. Amalgam	4.4%
14. Fluoride Duraphat	1.3%
15. Full Mouth Fluoride Varnish	31.4%
16. Excision of Chronic Mucocele	3.4%
17. Extraction Deciduous Teeth	2.8%
18. Extraction Permanent Teeth	14.4%

Table 4 gives a summary of the most common treatment among male patients under general anaesthesia. According to the result, full-mouth fluoride varnish treatment having the highest score among all the treatments. It is about 31.4%. The second highest is on fissure sealant restoration and extraction of permanent teeth, 14.4%. The third highest is on Stainless Steel Crown, 13.7%.

Table 5. The most common treatment under general anaesthesia among female

Type of Treatment	Cases(%)
1. Full Mouth Scaling	2.9%
2. Fissure Sealant Restoration	14.1%
3. Fissure Protection	1.3%
4. Preventive Resin Restoration	4.2%
5. Strip Crown	0.6%
6. Stainless Steel Crown	12.8%
7. Resin Modified Glass Ionomer Cements	4.8%
8. GIC Fuji IV	0.6%
9. GIC Fuji IX	1.0%
10.GIC Fuji II	1.9%
11.Composite Resins	13.7%
12. Amalgam	1.6%
13. Fluoride Duraphat	3.2%
14. Full Mouth Fluoride Varnish	1.0%
15. Excision Of Chronic Mucocele	0.6%
16. Extraction Deciduous Teeth	30.7%
17. Extraction Permanent Teeth	5.1%

Table 5 outlines the most frequent procedure for female patients under general anaesthesia. As a result, the deciduous teeth extraction procedure has the best ranking of all procedures. It's around 30.7%. The second largest is 14.1% for fissure sealant restoration. The third highest is 13.7% for composite resins.

Table 6. Crosstabulation of the most common treatment across gender

			Gender		Total
			Male *n*(%)	Female *n*(%)	*n*(%)
1. Full Mouth Scaling	Yes	*n*(%)	11(3.7%)	9(3.0%)	20(6.7%)
	No	*n*(%)	150(50.3%)	128(43.0%)	278(93.3%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
2. Fissure Sealant Restoration	Yes	*n*(%)	56(18.8%)	44(14.8%)	100(33.6%)
	No	*n*(%)	105(35.2%)	93(31.2%)	198(66.4%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
3. Fissure Protection	Yes	*n*(%)	7(2.3%)	4(1.3%)	11(3.7%)
	No	*n*(%)	1544(51.7%)	133(44.6%)	287(96.3%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)

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4. Preventive Resin Restoration	Yes	*n*(%)	18(6.0%)	13(4.4%)	31(10.4%)
	No	*n*(%)	143(48.0%)	124(41.6%)	267(89.6%)
Total *n*(%)			161(54.0%)	137(46.0)	298(100.0%)
5. Strip Crown	Yes	*n*(%)	2(0.7%)	2(0.7%)	4(1.35%)
	No	*n*(%)	159(53.4%)	135(45.3%)	294(98.7%)
Total *N*(%)			161(54.0%)	137(46.0%)	298(100.0%)
6. Stainless Steel Crown	Yes	*n*(%)	53(17.8%)	40(13.4%)	93(31.2%)
	No	*n*(%)	108(6.2%)	97(32.6%)	205(68.8%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
7. Resin Modified Glass	Yes	*n*(%)	12(4.0%)	15(5.0%)	27(9.1%)
Ionomer Cements, RMGIC	No	*n*(%)	149(50.0%)	122(40.9%)	271(90.9%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
8. GIC Fuji IV	Yes	*n*(%)	-	2(0.7%)	2(0.7%)
	No	*n*(%)	161(54.0%)	135(45.3%)	296(99.3%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
9. GIC Fuji IX	Yes	*n*(%)	8(2.7%)	3(1.0%)	11(3.7%)
	No	*n*(%)	153(51.3%)	134(45.0%)	287(96.3%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
10. GIC Fuji II	Yes	*n*(%)	13(4.4%)	6(2.0%)	19(6.4%)
	No	*n*(%)	148(49.7%)	131(44.0%)	279(93.6%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
11. Sandwich Technique	Yes	*n*(%)	1(0.3%)	-	1(0.3%)
Restoration	No	*n*(%)	160(53.7%)	137(46.0%)	297(99.7%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
12. Composite Resins, CR	Yes	*n*(%)	40(13.4%)	43(14.4%)	83(27.9%)
	No	*n*(%)	121(40.6%)	94(31.5%)	215(72.1%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
13. Amalgam	Yes	*n*(%)	10(3.4%)	5(1.7%)	15(5.0%)
	No	*n*(%)	151(50.7%)	132(4.3%)	283(95%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
14. Fluoride Duraphat	Yes	*n*(%)	17(5.7%)	10(3.4%)	27(9.1%)
	No	*n*(%)	144(48.3%)	127(42.6%)	271(90.9%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
15. Full Mouth Fluoride Varnish	Yes	*n*(%)	5(1.7%)	3(1.0%)	8(2.7%)
	No	*n*(%)	156(52.3%)	134(45.0%)	290(97.3%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
16. Excision of Chronic	Yes	*n*(%)	-	2(0.7%)	2(0.7%)
Mucocele	No	*n*(%)	161(54.0%)	135(45.%)	296(99.3%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
17. Extraction Deciduous Teeth	Yes	*n*(%)	122(40.9%)	96(32.2%)	218(73.2%)
	No	*n*(%)	39(13.15%)	41(13.8%)	80(26.8%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)
18. Extraction Permanent Teeth	Yes	*n*(%)	13(4.4%)	16(5.4%)	29(9.7%)
	No	*n*(%)	148(49.7%)	121(40.6%)	169(298%)
Total *n*(%)			161(54.0%)	137(46.0%)	298(100.0%)

Table 6 shows the treatment according to the gender distribution. From the crosstabulation analysis, it was found that the distribution of treatment across males and females is almost the same. The highest treatment is on the fissure sealant restoration, 100(33.6%) and follows by extraction of deciduous teeth 218(73.2%). The lowest treatment was found in

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Sandwich Technique Restoration 1(0.3%), excision of chronic mucocele, which is about 2(0.7%), and the treatment based on GIC Fuji IV 2(0.7%).

4. SUMMARY AND DISCUSSION

During the study time, there was a substantial increase in the numbers of patients that were seen at under-ground level treatment and even participated in dental care that participated in full general anaesthesia. Even though the number of retrieved cases was marginally lower than in the previous survey, it was noted that there was a higher number of cases by year as compared to the data retrieved from 10 years ago (Karim et al., 2008). This may be attributed to a rise of paediatric dental clinic referral cases and a larger number of paediatric dental specialists available at USM Hospital. Therefore, in believing that procedures like this are a good idea, it is assumed that the number of patients having dental surgery will continue to see the rise (Chen et al.,2017). Many patients were directed to dental services because they had early childhood caries, developmental problems, and complicated medical conditions. The typical treatment they last performed under is a tooth extraction followed by a restorative operation.

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5. REFERENCES

1. Nick D, Thompson L, Anderson D, Trapp L. (2003). The use of general anaesthesia to facilitate dental treatment. Gen Dent, 51: 464-8.
2. Albadri SS, Jarad FD, Lee GT, Mackie IC. (2006). The frequency of repeat general anaesthesia for teeth extractions in children. Int J Paed Dent; 16: 45- 48
3. Meechan JG, Welbury RR. (2003). Oral surgery for children: 2. Anaesthesia and sedation. Dent Update, 30: 206-212
4. Karim Z, Musa N, M Noor SF. (2008). Utilization of dental general anesthesia for children. Malaysian Journal of Medical Sciences 15.3: 31-39.
5. Chen YP, Hseih CY, Hsu WT, Wu FY, Shih WY. (2017). A 10-year trend of dental treatments under general anesthesia of children in Taipei Veterans General Hospital. Journal of the Chinese Medical Association 80.4: 262-268.
6. Karim Z, Musa N, M Noor SF (2008). Utilization of dental general anesthesia for children. Malaysian Journal of Medical Sciences 15.3: 31-39.