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Effect of Utilization of Intra –oral Camera on an Interventional Oral procedures in Children of Mosul City
Utilization of Intra –oral Camera on Interventional Oral procedure(Pulpotomy) in Children of Mosul City

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ABSTRACT
Aim The aims of the current clinical study in Mosul city center is to determine the effect of the use of an intra-oral on child's compliance and anxiety in relation with dental procedures(Pulpotomy).**Materials and Methods.** The sample of current study consisted of (40) children**.** Demographic information(name, age, gender)was obtained for all the children's parent before examination. The inclusion criteria children had good general health, age between 7-10 years for both gender, and not received any dental treatment before, they were randomly divided into two groups; a control group without the use of intra oral camera (CTR-group) (20)and an intraoral camera group (IOC-group)(20).**Results** The values of mean, maximum and minimum are different between the control and study group, comparison of mean values of intervention (pulpotomy) for the children in each group by one way analysis of variance (ANOVA) test, and the results showed that there were a highly statistically significant differences within and in between each group ($p \leq 0.01$)Dunkun multiple range test show the study after is highly significant than other group in systolic and diastolic blood pressure .**conclusion** The results of the present study showed that use of IOC as lead to increase the compliance and decreasing pain perception and state anxiety level in children without anxiety disorders during routine dental treatment .

Key word Pulpotomy , Dental anxiety, Intra Oral Camera.

I. INTRODUCTION

Restorative dentistry is a surgical intervention introduced to maintain the health of the dental pulp and preserve the longevity of the tooth. It does this by eliminating the cavitation which forms a protected climate for the dental plaque biofilm, thereby assigning the patient to carry out appropriate plaque control of the place, setting a restoration into a cavitated tooth also improves aesthetics and returns that tooth surface to inbred function[(1).]

The emphasis is now placed on stopping the disease process from commencing, preventing demineralization, and promoting self-healing mechanisms. As yet, no restorative material can adequately replace the natural form, strength, anatomy or appearance of the natural tooth. Minimal invasive cavity designs minimize unnecessary destruction of tooth structure, and facilitate the use of adhesive and biomimetic restorative materials [(2)], nowadays, pulpotomy continues to be the most common treatment for asymptomatic decayed primary molars with pulp exposure. The main target of this procedure is to preserve the involved primary tooth to its normal exfoliation stage while inflamed coronal tissue is removed[(3,4)]. This process involves the use of medicaments capable of being bactericidal and free of any side effects while promoting the healing process. An ideal medicament used for pulp chamber filling should not interfere with physiologic root resorption[(5)].

Several materials have been proposed and used by clinicians including formocresol (FC), ferric sulfate (FS), calcium hydroxide (CH), sodium hypochlorite (SH), mineral trioxide aggregate (MTA), and calcium-enriched mixture (CEM) in pulpotomy of primary molars[(6)].

Dental anxiety is defined as the distressed expectation of a visit to a dentist to the extent where a child might avoid treatment[(7,8)], while dental fear/phobia is defined as when the distressed expectation interferes with normal functioning[(9)].

Novel innovative methods have been developed helping providers of dental care render

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effective dental care, these tool are considered noninvasive, easily applicable and have advantages to the dental professional and the patient, of these tools is the intra oral camera [10].

The Aims of the Current Study

The aims of the current clinical study in Mosul city center is to determine the effect of the use of an intra-oral on child's compliance and anxiety in relation with different dental procedures(Pulpotomy) in terms of physiological responses to fear manifested in pulse rate, oxygen saturation and blood pressure in the children with and without the use of the intraoral camera.

II. MATERIALS AND METHODS

Sample collection and criteria

The study was approved by Research Ethics Committee board University of Mosul College of Dentistry, and from the directorate of Health / Nineveh, and also an approval from the Directorate of the Al-Noor Specialized Dental Heath Center/Nineveh was obtained, the sample of current study consisted of (40) children

Inclusion Criteria:(1) General good health (2) Age between 7-10 years for both gender(3) Patient not received any dental treatment before

Exclusion Criteria :

(1) Previous dental experience in medical setting or known dental phobia as reported by their parents. (2)The need for pharmacological management to obtain cooperation. (3)Medical disability such as the history of seizures or convulsion disorders, nystagmus, vertigo or equilibrium disorders, eye problems and autism.

The Design of The Study

The children were randomly divided into two groups; a control group without the use of an Intra Oral Camera (SZCNT. China) (CTR-group) (60)and an intraoral camera group (IOC-group)(60). Parents of children who were willing to participate in the study filled an informed consent after explanation of the procedure, and their information was recorded in a specially designed case sheet.

Type of The Dental Work

Tertiary Prevention (Intervention Treatment) including:(Pulpotomy).

Methods

Dental / Clinical examination:

Clinical examination was carried out under standardized condition following the recommendation of WHO for each child. Children was examined using dental probes, plane dental mirrors and the examiner was in front of the children, prior to examination general information were recorded in a special form for recording data.

Methods Technique

The children eligible to the treatment according to the inclusion criteria and the following was recorded

1- Physiological assessment including measurement of oxygen saturation by use Pulse Oximeter(Finger Pulse Qxime. China) heart rate monitor, blood pressure (systole and diastole), digital blood pressure and with wrist cuff was used (Sphygmomanometer(Gig Ben. China), blood pressure recording with conventional sphygmomanometer and stethoscope was avoided in this study which may lead to unnecessarily production of anxiety in children, oxygen saturation and pulse rate before starting the procedure and after for both groups. In order to minimize this range of error, pulse rate and blood pressure were recorded 3times for each case and the average was calculated to be the accepted value that was registered .

2-Behavioral Assessment

Also each child was assessed for the anxiety and behavior by using modified dental anxiety scale MCDAS and global scale.

The Global rating scale (GRS) was filled by the researcher the behavior was classified in to[11].

5: Excellent according to for both groups
4:Very good
3: Good
2: Fair
1: Poor

The scale consists of eight questions about being put to sleep to have treatment (Dental General Anesthesia) and 'having a mixture of gas which will help children to feel comfortable for treatment but cannot put you to sleep (Relative Analgesia), having tooth taken out, filling, injection in gum, teeth being scraped and polished, having teeth looked at 'going to the dentist generally. Each question has five scores ranging from relaxed or not worried to very worried in an ascending order from one to five. The maximum score is(40) and the minimum score is(8), this was modified in to 6 questions(in this study we excluded the point 7and 8 because both questions are about general anesthesia and laughing gas which are not popular in Iraq in public government facility) and translated in to Arabic to obtain an Arabic version of the six modified questions which used, each question was scored from 1-5 and the total score for the scale is between (5-30).

Technique

Pulpotomy was performed according to (Poyenet al.,2014)[12]

Steps involved included

1- Local anesthetic

2-Reduce the occlusal surface by around 1.5 – 2 mm with a bur (starting with this step will make caries removal and pulpal access quicker and easier).

3-Caries removal prior to pulpal access to reduce the bacterial load that the pulp may be exposed to and to ensure that the tooth is restorable. Then gain a small access to the pulpal chamber through the pulpal roof using a flat fissure bur.

4- Pulp extension , once we gained some access, the transition to a non-end cutting bur was done. Then an extension to the opening over the entire pulpal roof was made to access the whole pulp chamber.

5-Haemostasis was performed with a wet cotton pellet, by putting it into the chamber and leaving it for 3 – 5 minutes (until haemostasis was achieved).

6- Medicament by using a an amalgam plugger to transport the pulpotomy material (Vladmiva. Russia) into the pulp chamber, placing enough for at least a 2-4 mm covering over the canal openings.

7- Final restoration with amalgam as seen in figure (7).

This technique was used in both group in study group pictures display on the screen as a method of health education and distraction .

3.5 Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences

(SPSS, version 19). Which included the following:

1-Descriptive statistic including means, maximum, minimum, frequency, standard deviation values.

2- One way analysis of variances (ANOVA) and Duncan's multiple range test were used. The results were considered significant when $p \leq 0.05$.

III. RESULTS

Mean and Standard Deviation, frequency, percent for the Study and Control Group are listed in table (1). The mean value of are compared by one- way analysis of variance (ANOVA)test, and the result that were statistically highly significant difference within and between group at $P \leq 0.05$ as shown in table (2). The mean value between the control and study group in blood pressure (systolic and diastolic), heart rate shown that the highest value in control group in comparison with low value in study group after application of IOC, as seen in table(3). TABLE (4)show Duncan's Multiple Range for diastolic and systolic blood pressure.

IV. DISCUSSION

Dental decay, is a progressive bacterial damage or destruction of the teeth leading to loss of tooth minerals that beginning on the external surface of the teeth and can advance to across through the dentin then if not treated advanced to the pulp, eventually lead destruction of the essentialness of the tooth[13].

Vital pulp treatments has been considered as a negligibly obtrusive method for the administration of teeth with excited pulps contrasted with the regular methodology of root canal treatment[14].

Pulpotomy is a vital pulp therapy technique that used for preserving decayed prime tooth with extensive caries but without evidence of any sign of radicular pathology, which if not performed and the tooth treated will lead ultimately to extraction of the tooth. The ideal qualities of pulpotomy material should be innocuous to pulp, bactericidal, and encompassing structures, allow advance healing of the remaining radicular pulp without interfere with physiologic root resorption and do not any toxicity to the teeth [15].

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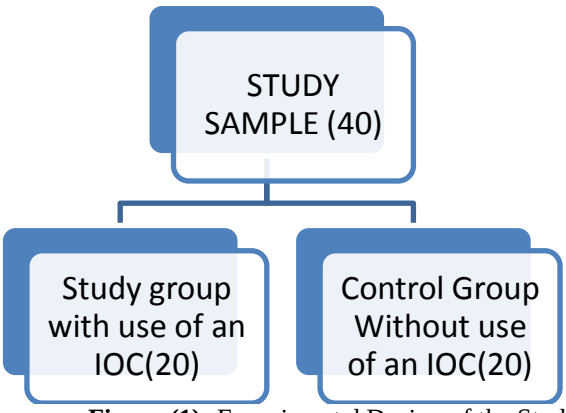

Figure (1): Experimental Design of the Study

Figure (2) :Intra Oral Camera

International Journal Dental and Medical Sciences Research
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Figure (3). Sphygmomanometer

Figure (4): Pulse Oximeter

Figure (5) :Physiological Assessment (Blood Pressure, Pulse Rate, SPO2)

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 71-79 www.ijdmsrjournal.com ISSN: 2582-6018

Figure(7):First and Second Primary Molar Filled with Amalgam Restoration .

Table (1) Distribution of Participants According to Age Group in Pulpotomy

					Age
Age Group	**Control**		**Study**		
	Frequency	**Percent**	**Frequency**	**Percent**
7.00	4	20.0	4	20.0
8.00	7	35.0	7	35.0
9.00	7	35.0	4	20.0
10.00	2	10.0	5	25.0
Total	**20**	**100.0**	**20**	**100.0**

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 71-79 www.ijdmsrjournal.com ISSN: 2582-6018

Mean	**8.35**	**8.50**
Standard Deviation	**0.93**	**1.10**

Table (2) :ANOVA for Pulpotomy Mean Values Between the Variables in Each Group.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SP	Between Groups	2567.83	3	855.94	8.145	.000**
	Within Groups	7986.65	76	105.08		
	Total	10554.48	79			
DP	Between Groups	1777.13	3	592.37	6.633	** .000
	Within Groups	6787.35	76	89.30		
	Total	8564.48	79			
PR	Between Groups	2403.73	3	801.24	5.168	** .003
	Within Groups	11781.95	76	155.02		
	Total	14185.68	79			
SPO2	Between Groups	3.45	3	1.15	.208	.891
	Within Groups	420.50	76	5.53		
	Total	423.95	79			

**p≤0.01 highly significant and *P≤0.05; statistical significant difference

Table(3): Descriptive Data Maximum Minimum and Mean Blood Pressure, Heart Rate, SPO, MCDAS, GS in Pulpotomy treatment for Control and Study Groups

Pulpotomy	N	Minimum	Maximum	Mean
(control) Systolic blood pressure before	20	94.00	128.00	110.30
Systolic blood pressure after	20	89.00	131.00	115.45

(study) Systolic blood pressure before	20	89.00	131.00	112.45
Systolic blood pressure after	20	86.00	121.00	100.35
(control) Diastolic blood pressure before	20	60.00	89.00	73.80
Diastolic blood pressure after	20	62.00	97.00	76.65
(study) Diastolic blood pressure before	20	57.00	90.00	74.60
Diastolic blood pressure after	20	53.00	78.00	64.40
(control) Heart Rate before	20	65.00	133.00	84.90
Heart Rate after	20	74.00	140.00	96.00
(study) Heart Rate before	20	79.00	135.00	99.05
Heart Rate after	20	75.00	124.00	89.80
(control) SPO2 before	20	88.00	99.00	97.15
SPO2 after	20	88.00	99.00	97.20
(study) SPO2 before	20	93.00	99.00	96.70
SPO2 after	20	93.00	99.00	96.85
(control) MCDAS	20	8.00	26.00	17.35
GS	20	2.00	5.00	3.15

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 71-79 www.ijdmsrjournal.com ISSN: 2582-6018

(study) MCDAS	20	6.00	24.00	15.55
GS	20	3.00	5.00	3.95

TABLE (4):Duncan's Multiple Range Test for Systole Blood pressure in Study and Control Groups in Pulpotomy Treatment

Systolic blood Pressure			
Duncan[a]			
Cod	N	Subset for alpha = 0.05	
		1	2
Study After	10	100.35	
Control Before	10		110.30
Study Before	10		112.45
Control After	10		115.45
Sig.		1.00	.138
Means for groups in homogeneous subsets are displayed.			
a. Uses Harmonic Mean Sample Size = 20.000.			
Diastolic blood Pressure			
Duncana			
Cod	N	Subset for alpha = 0.05	
		1	2
Study After	20	64.40	
Control Before	20		73.80
Study Before	20		74.60
Control After	20		76.65
Sig.		1.00	.374
Means for groups in homogeneous subsets are displayed.			
a. Uses Harmonic Mean Sample Size = 20.000.			