Oral Health Condition and Nutritional Status among Cleft Lip and Palate in Baghdad-Iraq

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ABSTRACT

Background: Orofacial cleft is the most common craniofacial birth defect and the fourth most common congenital malformation in humans that have an effect on oral health in addition to nutrient intake affected in those children. This research aims to investigate gingival condition, dental caries experience and nutritional status among children with orofacial cleft and compare them with normal children.

Materials and methods: The study group included 36 children with an age ranged (4-9) years of orofacial cleft. The control group included 37 children matched the control group in age and gender. Gingival condition measured by Gingival Index (Löe and Silness, 1963), while dental caries status was measured by (D_{1-4}MFs/d_{1-4}mfs) index according to the criteria of Manji *et al* (1989). The nutritional status was assessed using body mass index for age. Data analysis was conducted through the application of the SPSS (version 21).

Results: The DMFs, dmfs and Ds mean values were higher in study group than control group with no statistically significant differences, while ds mean values were higher in study group than control group with highly significant difference. GI mean values were higher in study group than control group with statistically highly significant difference. No significant difference in body mass index between study and control groups. Concerning severity, the study group had more gingival inflammation severity than control group, while regarding dental cries severity only grades d_1, d_3 and d_4 were significantly increased in study group than control group.

Conclusion: The children with orofacial clefts had increased risk for dental caries and gingival inflammation than normal children. The nutritional status was not different between children with orofacial cleft and healthy children.

Key words: Cleft lip and palate, nutrition, dental caries, gingival condition. **(J Bagh Coll Dentistry 2017; 29(4): 96-101)**

INTRODUCTION

Orofacial cleft (OFC) is the most common craniofacial birth defect and the fourth most common congenital malformation in humans [1, 2]. The craniofacial structures development is a coordinated process involving the growth of multiple independently derived embryologic prominences called primordia. Incomplete fusion of this facial structures during the fourth to eighth week of embryologic life results in a gap leads to cleft lip, cleft of the primary or secondary palate, or a combination of them. Elevated infant mortality and significant lifelong morbidity are associated with OFC such as cosmetic deformities, feeding problems, swallowing difficulties, failure to gain weight, change in nose shape, recurrent ear infections, poor growth of the maxilla, speech difficulties, misaligned teeth and dental abnormalities [2-4].

Persons with OFC are at a significant risk for periodontal disease and dental caries [5-8]. Body growth is important in OFC children because it reflects the accumulation of metabolism over time [9]. Many factors, such as feeding problems, recurrent respiratory infections and reconstructive surgery may affect the growth pattern of OFC children [10-12]. The nutrient intake of OFC children was little different from that of normal children [13].

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Another study found that nutritional status had no average differences from norms for children with OFC [9]. This study was designed and conducted in order to gain knowledge about nutritional status, dental caries experience and gingival condition among children with orofacial cleft and compares them with normal children.

MATERIALS AND METHODS

This study was carried out in Baghdad city, Iraq. Informed consent was obtained from each participant enrolled in this study before any data collection and examination of oral health. Two groups were examined with age range (4-9). The study group included thirty-six children, which matched the inclusion criteria and attended Alwasity and Ghazi Alhareery Teaching Hospitals/ maxillofacial departments. The inclusion criteria of the study group were as follow: (1) Non-syndromic OFC, (2) Surgically repaired, (3) Cleft with bone involvement. The control group, which included thirty-seven healthy children, those children attended pedodontics department at Baghdad Dentistry College. Control group matched study group in age and gender.

Dental caries and its severity were assessed according to decayed, missed and filled surfaces (D_{1-4} MF/ d_{1-4} mfs) index [14]. The gingival health condition was assessed by Gingival Index [15]. Height was measured using an ordinary measuring tape fixed at true vertical, flat surface,

while body weight measurements were taken on digital scale [16]. The percentile growth chart defined by The CDCP (Center for Disease Control and Prevention) was used to indicate the BMI according to age and gender [17]. Data analysis was conducted through the application of the SPSS (version 21) and Microsoft Office Excel (2007). Statistical analysis can be classified into two categories: (1) Descriptive Analysis which include percentage for nominal variables while mean, standard deviation (SD) and standard error SE for numeric variables and graphs, (2) Inferential analysis which include Levene test and two independent samples T-test. The confidence limit was accepted at 95% (P <0.05).

RESULTS

Results showed that there is no significant statistically differences between boys, girls and age groups; for that reason the whole sample were considered as one group without subgrouping according to gender and age.

Table 1 and 2 showed caries experience and caries severity differences between study and control groups for permanent and primary dentition respectively. The DMFs and Ds means were higher in study group than control group with no statistically significant difference (P>0.05), while the dmfs and ds means were higher in study group than control group with no statistically significant difference (P>0.05) for dmfs and highly significant difference (P<0.01) for ds component.

The Gingival index means among the study and control groups are illustrated in Table 3. The table shows that GI means were higher in study group than control group with statistically highly significant difference (P<0.01). The gingival inflammation severity illustrated in Figure 1. The figure shows that healthy gingiva was absent in study group, while the percentage of it within control group was 10.80%. The percentage of mild type of the gingival inflammation within study group was 72.20%, while its percentage within control group was 86.50%. The percentage of moderate type of the gingival inflammation within study group was 27.80%, while its percentage within control group was 2.70%. The sever type of the gingival inflammation was absent in both study and control groups.

Table 4 illustrates the mean values and standard deviations of the BMI among study and control groups. This table shows that no significant difference in BMI between study and control groups (P>0.05). The numbers and percentages of underweight, healthy, at risk of overweight and obese children in study and control groups represented in Table 5. The percentage of underweight children within study group was 2.8%, while its percentage within control group was 5.4%. The percentage of healthy children within study group was 91.7%, while its percentage within control group was 73%. The percentages of both at risk of overweight and obese children within study group were 2.8%, while their percentages within control group were 10.8%.

Table 1: Caries experience and caries severity differences between study and control groups for permanent dentition.

Variables	Groups								Independent sample Test		
	Study				Control				T#	df	Sig.
	N	Mean	±SD	SE	N	Mean	±SD	SE			
D_1	23	1.00	1.38	0.29	33	0.91	1.26	0.22	0.255	54	0.799
D_2	23	2.26	2.20	0.46	33	1.73	1.99	0.35	0.946	54	0.348
D_3	23	0.04	0.21	0.04	33	0.30	1.02	0.18	-1.426	35.80	0.162
D_4	23	0.70	2.22	0.46	33	0.03	0.17	0.03	1.431	22.19	0.166
Ds	23	4.00	3.55	0.74	33	2.97	3.09	0.54	1.154	54	0.253
Ms	23	0.22	1.04	0.22	33	0.00	0.00	0.00	1.000	22	0.328
Fs	23	0.17	0.65	0.14	33	0.18	0.53	0.09	-0.050	54	0.960
DMFs	23	4.39	4.15	0.87	33	3.15	3.19	0.56	1.263	54	0.212

#=Not significant at P>0.05.

Table 2: Caries experience and caries severity differences between study and control groups for primary dentition.

Variables	Groups								Independent sample Test		
	Study				Control						
	N	Mean	±SD	SE	N	Mean	±SD	SE	T	df	Sig.
d_1	36	1.75	1.63	0.27	37	0.86	1.21	0.20	2.63*	64.47	**0.011**
d_2	36	4.58	5.17	0.86	37	5.11	3.57	0.59	-0.51	71	0.614
d_3	36	4.28	5.44	0.91	37	1.54	2.28	0.37	2.79**	46.65	**0.008**
d_4	36	5.83	7.94	1.32	37	2.57	4.39	0.72	2.17*	54.23	**0.035**
ds	36	16.44	11.23	1.87	37	10.08	6.17	1.01	2.99**	54.03	**0.004**
ms	36	1.89	4.15	0.69	37	3.76	5.38	0.88	-1.66	71	0.102
fs	36	0.53	1.73	0.29	37	0.95	2.54	0.42	-0.82	71	0.415
dmfs	36	18.86	12.04	2.01	37	14.78	8.72	1.43	1.66	71	0.101

***=Significant at P<0.05, **=Highly significant at P<0.01.**

Table 3: The Gingival index difference among the study and control groups.

Variable	Groups						Independent sample Test		
	Study			Control			T	df	Sig.
	Mean	±SD	SE	Mean	±SD	SE			
GI	0.90	0.31	0.05	0.37	0.26	0.04	7.989**	71	**0.000**

****=Highly significant at P<0.01.**

Table 4: The BMI difference among the study and control groups.

Variable	Groups						Independent sample Test		
	Study			Control			T#	df	Sig.
	Mean	±SD	SE	Mean	±SD	SE			
BMI	15.69	1.13	0.19	16.59	2.82	0.46	-1.79	47.54	0.081

#=Not significant at P>0.05.

Table 5: The distribution of the study and control group according to nutritional status.

Nutrition	Groups			
	Study		Control	
	N	%	N	%
Underweight	1	2.8	2	5.4
Healthy	33	91.7	27	73.0
At risk overweight	1	2.8	4	10.8
Obese	1	2.8	4	10.8

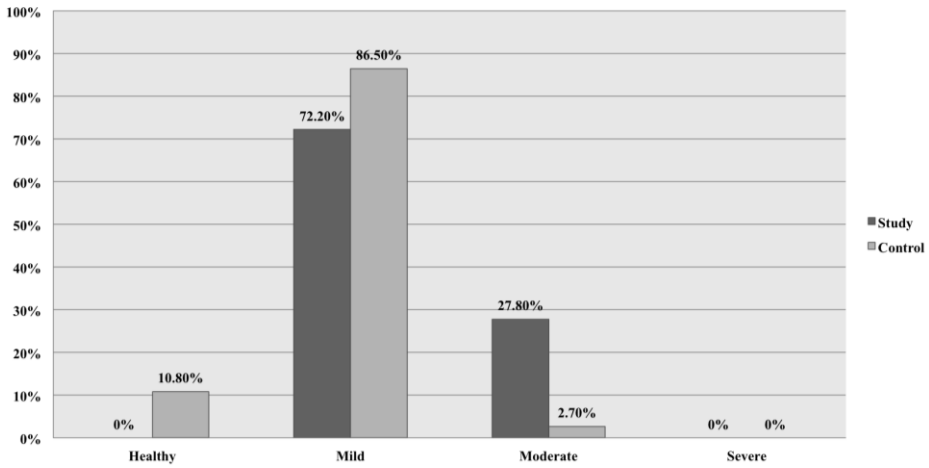

Figure 1: The gingival inflammation severity among study and control groups.

DISCUSSION

The present study data showed that there was no significant difference for DMFs between study and control groups, this result agreed with some previous studies conducted by Lucas *et al* and Cheng *et al* [18-19], while it was controversial with the findings of others [3, 4, 7]. This may due to that caries is a chronic infectious disease and the DMF/dmf index is a lifetime cumulative index of dental disease and treatment and may have little bearing on caries activity at a specific point in time; also the age range for the present study is short for permanent dentition observation [20].

Concerning dmfs and ds component were higher in study group than control group. These results agreed with Ja'afar and Dahllöf *et al* [3,5] and disagreed with other study conducted in Jordan [7]. Increased caries experience in children with OFC could be relate to dental abnormalities and the restricted access to proper oral hygiene and natural cleansing of the teeth because of the loss of elasticity and the anatomy of surgically repaired lip leads to fear of brushing around this area [5, 21], also tenacious nature of nasal fluid that drain from the palatal fistula enhances dental plaque stickiness [22], on the other hand parents are usually unaware of their children's increased susceptibility to dental caries and insufficient education about tooth brushing techniques and the important of oral hygiene and dietary practices, also they are more concerned with other aspects of care (surgery and speech development) so that the oral health at the lower end of the priority scale unless the child has discomfort [18, 19].

The results of current study showed that the mean value of gingival index for the study group was higher than that for the control group with statistically highly significant difference between two groups. This result was also reported by studies conducted previously [5, 7] and disagreed with others [8, 18]. As mentioned previously, the maintenance of oral hygiene influenced by the cleft deformity and the surgical scars, also the children's families preoccupied with other aspects of care [5]. Prolonged orthodontic therapy and wearing of prosthesis to prevent collapse of the dental arch commonly result in gingival inflammations [23]. Tissue discontinuation of alveolar and palatal area allows pathological bacterial colonies migration between the oral and the nasal cavities [8].

No significant difference was found in present study regarding BMI between study and control groups. This agreed with findings of Bowers *et al* and Gopinath [9, 13]. The percentage of underweight children within study group was lower than that within control group. The percentage of healthy children within study group was higher than that within control group, but the control group experienced increased percentages of both at risk of overweight and obese than study group. This could be relate to adequate nutritional intake in hospitals before and after surgical intervention to facilitate healing and growth and may relate to parental education and motivation concerning the importance of good nutrition [13]. This study made novel observations in Iraq that will provide a platform for further research that must collect additional and more detailed dietary analysis on a larger group of patients and longer duration in order to make entirely conclusive quantitatively results.

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حالة الفم الصحية و الحالة التغذوية بين شق الحنك والشفة الولادي في بغداد - العراق

الخلاصة

خلفية: شق الشفة و الحنك هو عيب قحفي ولادي ويعتبر هو رابع تشوه خلقي الأكثر شيوعا في البشر. الحالة التغذوية قد تتأثر عند هؤلاء الأطفال. تسوس الأسنان وإلتهاب اللثة تؤثر على سلامة صحة الفم والأسنان. يهدف هذا البحث إلى دراسة الحالة التغذوية وتسوس الأسنان و حالة اللثة بين الأطفال الذين يعانون من شق الحنك والشفة ومقارنتها مع الأطفال السليمين.

المواد والطرق: تضمنت هذه الدراسة ٣٦ طفلا مصاب بشق الحنك والشفة الولادي (المجموعة تحت الدراسة) تتروح أعمارهم (٤-٩) سنوات تمت مقارنتهم مع ٣٧ طفل سليم (المجموعة الضابطة) وقد تم مراعاة تطابق العمر والجنس بين المجموعتين. تم قياس تسوس الأسنان سريريا من خلال إستخدام دالة التسوس ($D_{1-4}MFs/d_{1-4}mfs$) وفقا لمعايير (Manji *et al* (1989)، أما أمراض اللثة فقد تم قياسها وفقا لمعايير (Löe and Silness, 1963). تم تقييم الحالة التغذوية بأستخدام مؤشر كتلة الجسم بالنسبة للعمر. أجري تحليل البيانات من خلال تطبيق برنامج (SPSS الإصدار 21).

النتائج: وجد في هذه الدراسة ان DMFs،dmfs وDs كانت أعلى قيم لمتوسط الرتب في المجموعة تحت الدراسة من المجموعة الضابطة مع عدم وجود فارق ذو دلالة إحصائية. فيما يخص السطوح المسوسة للأسنان اللبنية (ds) كانت أعلى في المجموعة تحت الدراسة مع فارق ذو دلالة احصائية عالية. هذه الدراسة اظهرت ايضا ان قيم متوسطات التهاب اللثة (GI) كانت أعلى في مجموعة الدراسة من المجموعة الضابطة مع فارق ذو دلالة إحصائية عالية. إلتهاب اللثة كان أكثر شدة في المجموعة تحت الدراسة من المجموعة الضابطة. بما يتعلق بشدة التسوس، فقط الدرجات d_4وd_1, d_3 إزدادت بشكل ملحوظ في المجموعة تحت الدراسة من المجموعة الضابطة. لا يوجد فرق كبير في مؤشر كتلة الجسم بين المجموعتين تحت الدراسة والضابطة.

الإستنتاج: إن الأطفال الذين يعانون من شق الشفة والحنك الولادي أكثر عرضة لتسوس الأسنان وإلتهاب اللثة من الأطفال السليمين، كذلك ليس لشق الشفه والحنك تأثير على الحالة التغذوية للأطفال الذين يعانون من شق الشفة والحنك الولادي.

الكلمات الرئيسية: شق الشفة والحنك، التغذية، تسوس الأسنان، حالة اللثة.