Screening the Periodontal Health Status and Oral Hygiene Practice in Preschool and Primary School Children

Assist. Lect. Dr. Basma F. Alanbari
B.D.S., M.Sc.
Basma.alanbari@gmail.com
Al-Rafidain University College - Department of Dentistry
Assist. Lect. Dr. Maitha Sameer kadhim
B.D.S., M.Sc.
maythaa2013@yahoo.com
Al-Rafidain University College - Department of Dentistry

Abstract

Objective: *The aim of this study was to evaluate the periodontal health status and oral hygiene practices among 4-12 year old children.*

Materials and Methods: *A total of 300 children aged from 4-12 years old, 144 males & 156 females constituted the study population. The study was conducted at dental clinic of Pedodontic & preventive department at al Rafidain College of dentistry, Baghdad/Iraq. Periodontal health status of the sample was examined using plaque and gingival indices and oral hygiene practice-related information was gathered by direct interviews.*

Results: *both PI & GI means value showed fluctuation within the three age groups. With the highest value reported in the 7-9 years old children of both genders. Both periodontal parameters were of higher values in the females children. The frequency of tooth brushing showed a positive correlation with age and a negative correlation with both PI&GI. The gingival inflammation assessment showed that mild gingivitis is the most prevalent type of gingivitis within the three age groups with the highest prevalence in*

the 7-9 years old group of both genders. Regarding oral hygiene performance. Majority of the children 171 (57%) practice daily oral hygiene, with the females showing higher percentage of tooth brushing performance. among whom 35% brushed twice/day and 65% brushed once/day. Out of the children who brushed their teeth 42% brushed at night,23% early in the morning and 35% at both timing, 62% used the horizontal tooth brushing method and the rest 38% used the vertical method. None of the screened children practiced dental flossing.

Conclusion: *Despite the daily oral hygiene practiced by the majority of children in the sample , mild gingivitis was prevalent therefore parents ,caregivers& teachers should be targeted during oral health education campaigns to encourage them to teach the correct tooth brushing habits to the children. We suggest that school based oral health promotion and education programmes should be instituted to give positive reinforcement of the oral hygiene practices the child may have learnt at home and to educate those who had never brushed their teeth before starting primary school.*

Keywords: *periodontal health status, oral hygiene practice, gingivitis prevalence.*

Introduction

The periodontium is a complex tissue comprised of two hard (cementum and bone) and two soft (gingiva and periodontal ligament) tissues [1]. A long time ago, it has been found that periodontium of the primary dentition differs from that of the permanent dentition in several aspects [2]. The gingiva in primary dentition appears to be more reddish, vascular, and flabby and to lack stippling. The periodontal ligaments in children are wider and have less dense fibers. The alveolar bone in primary dentition has less trabecula and calcification, more marrow spaces, and greater blood supply and lymphatic drainage [3, 4]. At the molecular level,

some investigators reported that periodontium of the primary dentition resorbed more easily because it contains more sialoprotein and osteoprotein, which facilitate the binding of odontoclast [5]. Periodontal diseases are a group of bacterial infectious and inflammatory diseases that result in the destruction of tooth-supporting tissue, including the gingiva, alveolar bone and the teeth themselves, which may eventually cause tooth loss, Those disease are nearly universal among children and adolescents [6].Oral hygiene plays an important role in the prevention of dental caries (first cause for tooth loss) and periodontal diseases (second cause for tooth loss) , It has been reported that the degree of oral hygiene determines the absence or presence of the aforementioned diseases [7, 8].

Oral hygiene is defined as those measures that are necessary to attain and maintain oral health including practices required to cleanse teeth, the periodontal tissues and the mouth in general, and contribute to a state of cleanliness in the oral cavity [9].

This includes tooth brushing and inter-dental cleansing aids such as dental floss, wooden tips and rubber tips [10]. This study was conducted in order to establish the study population's perception of the oral hygiene measures as it’s crucial for prevention of periodontal diseases that showed a high prevalence universally.

Material and Methods

A total of 300 children aged from 4-12 years old, 144 males & 156 females constituted the study population. The sample was randomly selected from the children attended the dental clinic in pedodontic and preventive department at Al-Rafidain College of Dentistry during the period extended from December 2013 to December 2014. The children were divided into 3 age stages reflecting their dental development early dentition stage (4-6), early mixed dentition stage (7-9) and the late mixed dentition stage (10-12) years old. Questionnaire Data were answered by means of examiner-patient interview and clinical examination. Each patient along with his/her accompanying parent was asked about the child's

name, age, address, oral hygiene practice, hospitalization, medication, and habits. They all were healthy and have no history of any systemic disease. General and oral hygiene related questions were asked to the children by the examiners and the reported answers were approved by the child parent before these answers were documented to insure their liability. The periodontal examination sets consisted of plane dental mirrors and color coded WHO probes. Oral hygiene was assessed using the criteria of plaque index (PI) by Sillness and Löe 1964 [11].While the gingival index (GI) was used to assess the gingival condition by Löe and Sillness 1963 [12]. Index teeth of Ramfjord [13] were examined to represent the whole dentition only fully erupted teeth were scored, if the index tooth was partially erupted or missing, that segment was excluded. Examinations were carried out in the dental clinic on the dental chair under artificial light by the researchers themselves. Interexaminer calibration was done with a non-significant differences in reproducibility ($p < 0.05$) Once all data were collected & tabulated, the statistical analysis conducted utilizing SPSS version 10.

Results

At table (1) the distribution of the study population according to age and gender. Table (2) showed the distribution of the sample according to tooth brushing frequency. This table revealed that 57% of the total sample practiced tooth brushing while the remaining 43 % did not practice at all, regarding gender differences a 48% of males of the study sample practice tooth brushing 31% out of the them brush once/day and 17% brush twice/day , the rest 52 % of males do not brush at all while for females the percentages were 65% practice daily tooth brushing with 42% out of them brush once/day and 23% brush twice/day ,the percentage of the females who never practiced tooth brushing was 35%. From these result it's obvious that oral hygiene performance of the females is higher than the males.

Table (3, 4) illustrated the mean values of males and females PI & GI respectively for the three age groups. The three age groups showed variation in the means of PI & GI, with the highest means reported in the 7-9 years age groups for both genders.

Table (5) showed Correlations between the frequency of brushing & the other variables, In the total sample brushing frequency showed a positive correlation along with the age, meaning that by getting older the children tends to enhance their oral hygiene performance, on the contrary it showed a negative correlation with the means of PI & GI meaning that when the brushing frequency increase the two periodontal parameters tend to decrease.

Table (6) illustrated The prevalence of gingivitis among the children according to the gender, as shown the mild type of gingivitis is the most prevalent type within the total population with a percentage of (83%, 71%) for males and females respectively and 77 % within the total sample, children with healthy gingival tissue constituted only 6 % of the study population (4% of the males and 8% of the females) and the rest 17 % of the study population showed clinical signs of moderate type gingivitis (13% of the males and 21% of the females).

Table (7) showed the prevalence of gingivitis among the children according to the age groups. From this table it is obvious that mild gingivitis showed the highest prevalence in all the age groups as it showed a 88% in 4-6 years, 94 % in 7-9 years & 84% in the oldest group 10-12 years.

Table (8) showed the distribution of the children according to their answers to oral hygiene –related questions.1) timing of tooth brushing: out of 171 children who brushed their teeth, 42% brushed at night before going to bed, 23% early in the morning once they wake up & 35% brushed twice a day one at night before going to bed and once they wake up in the morning .the second question method of tooth brushing: the answers were 62% of the children brush their teeth using the horizontal method and the rest (38%) used the vertical method. Regarding interdental cleaning

aids, none of the sample (0%) utilized dental floss even in the boys and girls in the older age groups (10-12) years.

Discussion

Gingivitis is the most prevalent condition in the child population after dental caries [Francisca Varas ,Gisela Zillmann et al;2011]. Since self-performed Oral hygiene is the master key for treatment & prevention of gingivitis, Regular tooth brushing in children & adolescence predicts stable better dental & periodontal health status later in life. For these reasons this study was conducted in order to provide data regarding the prevalence of gingivitis, the frequency & quality of oral hygiene performance in children within different age groups.

in the scope of this study A higher percentage of girls were practicing oral hygiene and this can be explained by the fact that feminine nature of the girls makes them spend more willing to look after themselves and had more attention for facial appearance than do boys this agree with [Chen M, Andersen R; 1997 & Barzan A. Mirza ,Vian M. Hussain;2006] study and disagree with [Al–Dahan AA, Muhi–Aldeen LK;1998, Salman FD;2004].

Since quality has an even importance as frequency when evaluating the oral hygiene measures, the study monitor the quality of tooth brushing performed by the children by assessing the periodontal parameters PI & GI. Tables (3, 4) showed that the PI & GI both showed fluctuation within the three age groups of both genders. With the minimum values in 4-6 years peaking to the maximum values in the 7-9 years and sloping down as the children reach 10-12 years old same finding was observed by [20] this increase in both parameters means values in the 7-9 years old group is transient and accompany the temporary stage of mixed dentition that renders the oral hygiene more difficult to master by the growing child [14], the guidelines of Massachusetts Department of Public Health [21] declared that Up until about age 8, most children do not have the fine motor skills to independently brush their teeth effectively, so Children will need supervision and assistance in order to brush safely, correctly, and thoroughly. this finding

highlighten the importance of the guidelines that advice the continuity of parental supervision during oral hygiene performance by the child until the age of 12 years old .

As the children get older the percentage of children who practice oral hygiene is increased this is evident by the positive correlation between the sample age & the frequency of brushing this in particular can be due to increased oral hygiene awareness as the child get older whether the source of this awareness is due to parental influence or from the school even the television advertisements & cartoons that are playing an important role in raising such awareness in the children as reported by the children parents and school teachers. A negative correlation was found between the PI & GI along with the brushing frequency and this agreed with the fact that gingival health is directly linked to the oral hygiene performance & when the improvement in the latter reduce the scores of both PI & GI [22,23].

The mild type of gingivitis is the most prevalent type among the children of the three age groups of both genders this is in agreement with [24,25] and it may be due to the facts that the commonest type of gingivitis in early childhood is the mild one due to several reasons including inadequate oral hygiene or/and eruption gingivitis as a consequence of malalignment of the erupting teeth that would aggravate gingival inflammation and make the oral hygiene performance more difficult and painful sometimes[26,27,28].

Regarding oral hygiene routine the majority of the sample practiced tooth brushing at night before going to bed utilizing the horizontal method of tooth brushing. The oral hygiene awareness of the parents, caregivers and school teachers should be raised in order to meet the pediatric oral hygiene Guidelines that recommend brushing for two times daily by using soft tooth brush and a pea size tooth paste for two minutes , especially at night before bedtime utilizing the circular method of tooth brushing. Parent's supervision is crucial since most preschool-aged children do not have the manual dexterity to effectively clean their own teeth.

Conclusion

The study calls for in depth analyses of the processes which influence the children's brushing habits and raise their knowledge about the periodontal diseases and the link between those diseases with lack or inadequate tooth brushing, possibly parents should be targeted during oral health education campaigns to encourage them teaching tooth brushing habits to their children and supervise them during the crucial stages of their development. School based oral health promotion and education programmes should be instituted to give positive reinforcement of the oral hygiene practices the child may have learnt at home and to educate those who had never brushed their teeth before starting primary school.

Table (1): Number and percentage of sample Distributed according to gender and age groups

Age Group	Male		Female		Total	
(Years)	No.	%	No.	%	No.	%
4-6	27	19	45	29	72	24
7-9	54	37	39	25	93	31
10-12	63	44	72	46	135	45
Total	144	48	156	52	300	100

Table (2): Frequency distribution of sample According to tooth brushing frequency by gender and age groups

Age Group		Brushing frequency							
		Total sample		Male			Female		
(Years)		YES	NO	None	Once	Twice	None	Once	Twice
4-6		24	48	21	6	0	27	12	6
7-9		51	42	21	27	6	21	15	3
10-12		96	39	33	12	18	6	39	27
Total	No.	171	129	75	45	24	54	66	36
	%	57	43	52	31	17	35	42	23

Table (3): Mean and standard deviation of plaque Index for males& females according to age group

Age group	Male PI		Female PI	
	Mean	±SD	Mean	±SD
4-6	0.35	0.40	0.49	0.37
7-9	0.82	0.90	0.88	0.90
10-12	0.54	0.42	0.56	0.40
Total sample	0.54	0.60	0.67	0.62

Table (4): Mean and standard deviation of Gingival Index for males and females according to age group

Age groups	Male GI		Female GI	
	MEAN	±SD	MEAN	±SD
4-6	0.41	0.38	0.44	0.33
7-9	0.61	0.42	0.7	0.44
10-12	0.47	0.41	0.50	0.42
Total sample	0.49	0.42	0.55	0.40

Table (5): Correlation between the frequency of brushing With the Age, PI & GI.

Brushing frequency	Age	PI	GI
r	0.3	-0.32	-0.45

Table (6): Distribution of the samples in relation to severity of gingival inflammation by gender.

Gingival condition	GI score	Male No.=144		Female No.=156		Total sample No.=300	
		No.	%	No.	%	No.	%
Healthy	0	6	4	12	8	18	6
Mild gingivitis	0.1-1	120	83	111	71	231	77
Moderate gingivitis	1.1-2	18	13	33	21	51	17

Table (7): Distribution of the sample in relation to severity of gingival inflammation by age groups.

Gingival condition	GI score	4-6 years		7-9 years		10-12 years	
		No.	%	No.	%	No.	%
Healthy	0	6	8	0	0	12	9
Mild gingivitis	0.1-1	63	88	87	94	114	84
Moderate gingivitis	1.1-2	3	4	6	6	9	7

Table (8) Distribution of the sample according to their answers to Oral hygiene-related questions

Questions	Answers	No.	%
When do you brush?	Before going to bed	71	42%
	When I wake up in the morning	40	23%
	Both times	60	35%
How do you brush?	vertical	65	38%
	Horizontal	106	62%
Do you floss?	Yes	0	0%
	No	171	100%

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استطلاع الحالة الصحية اللثوية والطرق المتبعة لتنظيف الاسنان لدى الاطفال بعمر 4 - 12 سنة

م.م.د. بسمة فتحي الانباري
Basma.alanbari@gmail.com
كلية الرافدين الجامعة – قسم طب الأسنان
م.م.د.ميثاء سمير
maythaa2013@yahoo.com
كلية الرافدين الجامعة – قسم طب الأسنان

المستخلص

اهداف الدراسة: تقييم الحالة الصحية اللثوية والنظام الصحي المعتمد للحفاظ على نظافة الاسنان لدى الاطفال بعمر4-12 سنة.

المواد والطرق: ضمت العينة الدراسية ما مجموعه 300 طفل تتراوح اعمارهم ما بين 4-12 سنة، 144 كانوا ذكور و الباقي 156 كن اناث. الحالة الصحية اللثوية للاطفال تم تقييمها عن طريق موشر الصفيحة البكتيرية والمؤشر اللثوي اما المعلومات المتعلقة بالنظام المعتمد لتنظيف الاسنان فتم جمعها عن طريق المقابلة المباشرة بين الباحث والاطفال.

النتائج: كلا من مؤشر الصفيحة البكتيرية والمؤشر اللثوي اظهرا تذبذبا بين المراحل العمرية المختلفة ولكلا الجنسين، مع تسجيل اعلى القيم لكلا المؤشرين المذكورين للمرحلة العمرية ذات ال 7- 9 سنوات من كلا الجنسين. كلا المؤشرين كانا ذوي قيم اعلى لدى الاناث مقارنة باقرانهم من الذكور. كان معدل تنظيف الاسنان بالفرشاة قد اظهر زيادة طردية مع تقدم الاطفال بالعمر وبينما كان له علاقة عكسية مع مؤشرات الصحة اللثوية المذكورة. التهاب اللثة من النوع البسيط كان هو الاكثر انتشارا بين الاطفال و خصوصا في عمر 7 - 9 سنوات لكلا الجنسين. فيما يخص النظام المتبع

لتنظيف الاسنان من قبل الاطفال فالاغلبية 171(57%) قاموا بتنظيف اسنانهم بالفرشاة مع اغلبية انثوية. 35% من الاطفال استعملوا الفرشاة مرتان يوميا و65% مرة واحدة. 42% من الاطفال قاموا بتنظيف الاسنان ليلا قبل الخلود للنوم و23% نهارا بعد الافطار و 35% من الاطفال قام بتنظيف اسنانهم في كلا التوقيتين. 62% من الاطفال استعملوا طريقة تفريش الاسنان الافقية بينما استعمل البقية ونسبتهم 38% استعملوا الطريقة العمودية. لم يستعمل اي من الاطفال الذين شملتهم الدراسة ادوات تنظيف ما بين الاسنان.

الاستنتاج: بالرغم من تنظيف الاسنان اليومي من قبل غالبية الشريحة التي شملتهم الدراسة الا ان التهاب اللثة من النوع البسيط اظهر انتشارا عاليا لذلك فان الاهل و مقدمي الرعاية للاطفال في المدارس يجب ان يكونوا الهدف لبرامج التوعية الصحية وحملات زيادة الوعي لصحة الفم والاسنان بهدف نقل العادات الصحية السليمة للاطفال و زيادو وعيهم و تثقيفهم حول امراض الاسنان .

الكلمات الرئيسية: الحالة الصحية اللثوية، طريقة تنظيف الاسنان، انتشار التهاب اللثة.