Overweight in Relation to Dental Caries in Primary and Permanent Teeth among Children Aged 7-9 years in Wassit Governorate- Iraq

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زيادة الوزن و العلاقه مع تسوس الأسنان اللبنية والدائميه بين الأطفال بعمر ٧-٩ سنوات في محافظة واسط-العراق

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الخلاصة

ان الهدف من هذه الدراسة هو تحديد العلاقة بين زيادة الوزن و تسوس الأسنان اللبنية و الدائميه بين الأطفال العراقيين بعمر٧-٩ سنوات من كلا الجنسين في محافظة واسط. العينة جمعت ابتداءا من ١ أيلول – ١ تشرين الثاني ٢٠١٠.

تم حساب الطول والوزن للأطفال باستخدام الميزان الاليكتروني، ثم تطبيق معادلة الطول و الوزن BMI لكل طفل.

في هذه الدراسة وجد أن نسبة الزيادة بالوزن والسمنة هي ٦% وتزداد بزيادة العمر. كذلك النتائج بينت أن معدل تسوس الاسنان الدائميه DMFT عند الأطفال ذو الوزن الزائد هو (١.٤±١.٣٨) بينما عند الأطفال ذو الوزن الطبيعي هو(١.٢± ١.٤٢) وكذلك معدل تسوس الأسنان اللبنية dmft عند الأطفال ذو الوزن الزائد هو (٤.٥ ± ٢.٥) مقارنتا مع (٤.٢± ٢.٥) عند الأطفال ذو الوزن الطبيعي .

كذلك وجد ان نسبة انتشار تسوس الأسنان عند الأطفال ذو الوزن الزائد هو١٠٠% و٦٠% للأسنان اللبنية والدائميه على التعاقب ، كذلك وجد ان نسبة انتشار تسوس الأسنان عند الأطفال ذو الوزن الطبيعي هي ٩٢.٨% و٥٣.٦% للأسنان اللبنية والدائميه على التعاقب . التحاليل الاحصائيه بينت انه لا يوجد ارتباط معنوي بين الوزن الزائد و تسوس الأسنان.

أن المحصلة النهائية من هذا البحث أن أطفال المدارس ذو الوزن الزائد يمتلكون معدل تسوس(DMFT, dmft) أعلى من الأطفال ذو الوزن الطبيعي أو الأقل من الطبيعي، لكن ليست هنالك ارتباط معنوي بين زيادة الوزن وانتشار وشدة تسوس الأسنان.

Abstract

The purpose of this study was to determine the relationship between overweight and dental caries in primary and permanent teeth among Iraqi children aged 7-9 years of both genders in Wassit Governorate . The sample was collected during a period started from 1/ September to 1/November 2010. The weight and height of children were measured using Electronic Body Scale and BMI was calculated to each child in this study. In the present study, it was found that percent of overweight and obesity was 6% and it increased with age. Results showed the mean of DMFT for overweight children was (1.4±1.38) while for normal weight children was (1.29±1.42) and the mean of dmft for overweight children was (4.52

± 2.51) compared to (4.27 ± 2.56) for normal weight school children. In addition, it was found that prevalence of dental caries in overweight children was 100% and 60% for primary and permanent dentitions, respectively and the prevalence in normal weight was 92.8% and 53.6% for primary and permanent dentitions, respectively. Statistical analysis showed no significant association between overweight and dental caries in primary and permanent teeth.

It was concluded that overweight school children had higher mean dental caries scores(DMFT and dmft) and higher prevalence of dental caries in primary and permanent teeth than normal weight school children but there was no significant association between overweight and dental caries prevalence and severity.

Introduction

Excessive weight in children is a major public health concern, the number of affected individuals is increasing, and the health consequences of pediatric obesity into adulthood are only now being perceived, weight status in children is measured by assessment of body mass index (BMI) (1). The number of overweight children has almost tripled in the United States from 1980 to 2002 (2,3). Moreover, the prevalence of overweight children doubled in the six to eleven year age group and tripled among twelve to seventeen year olds in the last twenty years (4,5). This phenomenon is not confined to the United States but affects children worldwide (6). An association between dental caries and weight in children has been proposed by preliminary and population-based studies (7,8). Although stronger evidence exists for the association between periodontal health and weight in adults (9).Dental caries and childhood obesity epidemics are multifactorial complex disease and children's dietary pattern is a common underlying etiological factor in their causation (10). The body mass index (BMI) is a measure which shows whether people have the right weight for their height. The World Health Organisation (WHO), governments and health workers use it. It is also called the Quetelet Index. The BMI was invented by Adolphe Quetelet between 1830 and 1850 (11). BMI is still sometimes called the Quetelet Index.A scientist called Ancel Keys first used the name body mass index in 1972. He wrote that governments should measure people's BMI to find out whether their people are too fat or too thin (12). Study examined the Association between overweight and dental caries among U.S children by measuring the BMI for each child and dental caries prevalence and severity, mean dental caries scores dmft=3.3 and DMFT= 2.5 (13). One hundered and thirty –five children were recruited in a four-month period. The DS/ds index was used to assess caries, and BMI percentile was calculated based on age and gender –adjusted published scales. Statistical analysis found no correlation between dental decay in obese and non-obese children was detected (14). The purpose of this study was to evaluate the association between overweight and dental caries in both primary and permanent teeth.

Methods

Five hundred of schoolchildren in Wassit Governorate belong to age group 7-9 years of both genders were studied. All children subjected to clinical examination to obtain information about dental caries by assessment of decayed teeth, missing due to caries and filling teeth for permanents (DMFT) and primary (dmft) teeth. The weight and height of all children were measured using electronic body scale(Fig 1) (13). The sample collection started from 1/September to 1/November 2010.

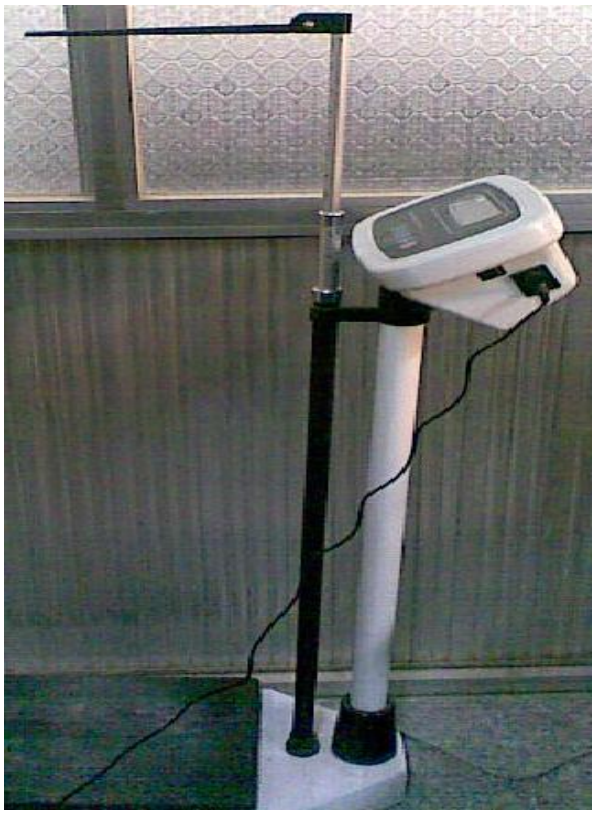

Fig 1: Electronic body scale

The BMI was calculated for each child as the following (11,12):

- measure their weight (body mass) in kilograms
- measure their height in meters
- divide their weight by the square of their height

This is the formula:

$$\mathrm{BMI} = \frac{weight}{height^2}$$

Then the result of formula for each child were compared with BMI chart ,so the overweight and obese children were determined (Table 1).

Table (1): BMI chart

Category	BMI range
Seriously Underweight	less than 16.49 (--16.49)
Underweight	between 16.5 and 18.49 (16.5--18.49)
Normal	between 18.5 and 24.99 (18.5--24.99)
Overweight	between 25 and 29.99 (25--29.99)
Obese	30 or more (30--)

Statistical Analysis

The data were analyzed using

1. Descriptive statistics (mean + standard deviation)
2. Inferential statistics (students t-test + Chi- square analysis+ Fisher's Exact test)

Results

The sample examined in this study was 500 school children in Wassit Governorate, males and females aged 7-9 years. The percent of school children with overweight and obesity was 6% , the percent of overweight in male was 8.5% while in female was 3.3% , the percent of overweight and obesity increased with age (Table 1).

Table (1): Number and percent of overweight and normal weight of school children with age

Age	Overweight children		Normal weight children	
	No	%	No	%
7	5	16.6%	138	29.4%
8	7	23.4%	160	34%
9	18	60%	172	36.6%
Total	30	100%	470	100%

The mean DMFT for overweight school children was (1.4±1.38) while the mean for normal weight school children was(1.20±1.42) ; the mean DMFT of overweight children was more than that of normal weight children, but there was no statistical significant difference between mean DMFT of overweight and normal weight school children (Table 2).

Table (2): Mean DMFT of overweight and normal weight schoolchildren.

DMFT	Overweight	Normal weight
Mean	1.40	1.29
±SD	1.38	1.42
t-test	-0.415	
d.f	498	
P-value	0.678	

(Non significant)

The mean dmft of overweight school children was (4.52 ± 2.51) while the mean of normal or underweight school children was(4.27 ± 2.56) ; the mean dmft of overweight children was more than that of normal or underweight children, but there was no statistical significant difference between the mean dmft of overweight and normal weight school children (Table 3).

Table (3): Mean dmft overweight and normal weight school children.

dmft	Overweight	Normal weight
Mean	4.52	4.27
±SD	2.51	2.56
t-test	0.533	
d.f	498	
P-value	0.594	

(Non significant)

The percent of overweight children with dental caries in permanent teeth was 60% while the percent of normal or underweight children with dental caries in permanent teeth was 53.6% ; the prevalence of dental caries in overweight children was more than that in normal or underweight children , but Chi-square analysis showed no significant association between overweight and dental caries in permanent teeth (Table 4).

Table (4): Number and percent of overweight and normal weight schoolchildren with dental caries in permanent teeth.

Dental caries scores	Overweight		Non	
	No	%	No	%
DMFT=0	12	40%	218	46.4%
DMFT>0	18	60%	252	53.6%
Total	30	100%	470	100%
X2	0.463			
P-value	0.496			

(Non significant)

The percent of overweight children with dental caries in primary teeth was 100% while the percent of normal or underweight children with dental caries in primary teeth was 92.8% ; the prevalence of dental caries in overweight children was more than that in normal or underweight children , but Fisher's Exact test showed no significant association between overweight and dental caries in primary teeth (Table 5).

Table (5): Number and percent of overweight and normal weight schoolchildren with dental caries in primary teeth.

Dental caries scores	Overweight		Normal weight	
	No	%	No	%
dmft=0	0	0%	34	7.2%
dmft>0	30	100%	436	92.8%
Total	30	100%	470	100%
Fisher's Exact test	0.113			

(Non significant)

Discussion

In the present study the prevalence of overweight and obesity was 6% which is almost equal to the prevalence of overweight in Iraqi in 2005 (6%) (15).

In the present study the mean dmft/DMFT for overweight children was 4.5 and 1.4 for primary and permanent respectively while for normal weight children it was 4.2 and 1.2 for primary and permanent teeth respectively; the mean of dental caries scores for overweight children was more than that of normal weight , but statistical analysis showed that there was no significant difference between the mean dmft/DMFT of overweight and normal weight school children that mean there was no significant association between overweight and dental caries in primary and permanent teeth this is in agreement with other studies (13,16) . These results may be due to that dental caries is a multifactorial disease , factors affecting the onset of carious lesions include oral hygiene, diet composition and frequency, socioeconomic status, salivary immunoglobulin, bacterial load and fluoride intake and perhaps these findings illustrate that the relationship between overweight and dental caries in children is far more complex than can be explained by carbohydrate consumption alone.

Exploration of the link between weight and oral health in children has been controversial , so in the present study , the prevalence of dental caries in overweight children was higher 100% and 60% for primary and permanent teeth respectively than in normal weight was 92.8% and 53.6% for primary and permanent teeth respectively; but Chi-square analysis showed no significant association between overweight and dental caries prevalence in both primary and permanent teeth this is in agreement with Macek et al, 2005 (13) and disagreement with other studies (14,17).

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