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ORIGINAL ARTICLE

The relationship between obesity and dental caries according to life style factors in schoolchildren: a case-control study

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ABSTRACT

Objectives: To evaluate the association between obesity and dental caries in terms of life-style habits and socio-economic status in Turkish school children.

Materials and methods: This case-control study was undertaken with 178 children aged 6–11 years in a Turkish government children's hospital. The case group consisted of 86 obese children who were categorized in ≥95 percentile according to the BMI. The control group consisted of 90 non-obese children that would not raise any doubts about the teeth disease. Data of demographic features and life-style habits were obtained by a questionnaire at the dental examination. Caries experience was measured with DMFT and dmft indices.

Results: No difference was found between obesity and caries prevalence in primary dentition ($p = .957$); however, there was a statistically significant association in the permanent dentition ($p = .002$). Also, no differences were found in children with healthy natural teeth between the study groups according to education level, family income and food consumption during TV viewing in primary dentition ($p = .297$; $p = .652$; $p = .023$).

Conclusions: It can be concluded that obesity appears to be not a possible risk factor for dental caries in primary dentition, but would be a probable endangerment in the permanent dentition.

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Introduction

Dental caries is still known as the most prevalent chronic childhood disease in the world, although its prevalence has dropped in recent decades in many developed countries. In the United States, the National Health and Nutrition Examination Survey (NHANES) (2011–2012) stated that more than 50% of children aged 6–18 years were affected with caries [1]. In England, Wales and Northern Ireland, the Children's Dental Health survey (2013) [2] reported the obvious caries experience as 49%, 34% and 46% in children aged 8, 12 and 15 years, respectively. In Turkey, National Survey carried out in 2004 by the Ministry of Health in cooperation with Hacettepe University, reported that 70% of the children at age of 5 and 61% of the children at age of 12 presented caries [3]. Early childhood caries which affects primary teeth during early stages of life, continues as a threatened risk in school years and track into adulthood. This growing burden of dental caries can have a deep effect on the oral and overall health and quality of life of children.

Childhood obesity is defined as the body's excess fat, and owing to its worldwide distribution and serious effects, is described as a global pandemia [4]. This mounting public health problem is associated with both immediate and long-term risk factors such as heart disease, hyperlipidaemia, hyperinsulinaemia, hypertension and adult obesity [5]. Child obesity is rapidly expanding throughout the world. It is estimated that 7% of the world's population is obese and almost 20% is overweighed (OW). In the United States, 15.8% of children at age 6–11 participating in NHANES were overweighting [6]. In England, the prevalence is reported as 16% among children aged 2–16, in 2006 [7]. In Europe, it is stated that 20% of children under 10 years of age are OW or even obese, according to international task force criteria [8]. In Turkey, there is no information regarding the prevalence of childhood obesity throughout the country, but the prevalence in regional statistics varies between 2% and 8.4% [9].

A number of studies have been conducted to explore the relationship between childhood obesity and dental caries for many years, and theoretically the correlation seems logical, but findings to date have been inconsistent. While some researchers have found a positive association between overweight and caries among children [10–16], other researchers have not reached a notable association [17–22]. The presence of high prevalence of these two burden diseases, but, lack of identified relationship between each other, led researchers to investigate the contributing factors. When the aetiology of dental caries and obesity is examined separately, it is seen that they have many in common. The most similar factors which they share are socio-economic status (SES) and life style factors including diet [20–23].

Body mass index (BMI) is one of the most accepted and widely used method for classifying and for screening the

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overweight and obesity in children and adolescents [24]. Hence, according to BMI, children were categorized using age and gender specific criteria as underweight (<5th percent), normal (5th–85th percent), at risk for overweight (>85th and <95th percent) and overweight (≥95th percent) [25]. In the literature, the majority of the studies were conducted in a given society such as classifying BMI indexes of children and evaluating them by comparing with the prevalence of caries. Unfortunately, studies carried out with only the target group of obese school children are very few [26]. Also, research on the relationship between obesity and dental caries in terms of SES and life style factors among the same age group is insufficient [27].

The aim of the present study was to evaluate the relationship between obesity and dental caries according to the life style habits and SES in obese Turkish Elementary school-aged children.

Materials and methods

Setting and study population

This case-control study was conducted on children aged 6–11 years who attended Dr. Behcet Uz Children's Hospital, Izmir, Turkey between March 2012 and April 2013. This study was undertaken in compliance with the guidelines of the Declaration of Helsinki and it was approved by the local ethics committee of the Dr. Behcet Uz Children's Hospital (2012/10). The participants signed an explicative authorization document of their own free will before enrolment in the study.

The sample size of two independent groups which are case and control, was estimated by using G Power software (Version 3.1.9.2), considering a significance level set at 5%, 90% of power, medium class, and a sample ratio of 1:1, which resulted in 86 children in each group. A total of 176 volunteers who gave informed consent participated in this study.

The case group consisted of 86 obese children who applied and were examined for the first time at the clinic for endocrinology and were categorized in ≥95 percentile according to the BMI (body weight/(body height)^2 in kg/m^2) by using an internationally recognized classification system [25]. Weight loss programmes of these patients included a balanced diet, physical activity, and psychological and educational support.

The control group consisted of 90 non-obese children selected from different clinics of the same hospital that would not raise any doubts about the teeth disease or interfere with dental complaints. The patients were mostly chosen from the dermatology and physical therapy and rehabilitation clinics of the hospital. The children were weighed in light clothing without shoes in the morning using an electronic scale to the nearest 0.1 kg. Their height was measured using a stadiometer to the nearest 0.1 cm. Only children with normal weight regarding BMI (5th–85th percentile) were included in the control group.

Clinical examinations

This research was designed as a case-control study. Patients from the relevant clinics were referred to the dental clinic of the hospital. The dental examination, based on WHO criteria was carried out by one dentist in the dental chair using a dental mirror and a dental probe [28]. No X-rays were taken. To assess the caries experience of both groups, DMFT index for permanent dentition and dmft index for primary dentition were used. A tooth was named as decayed (d) if it was detected at the cavitation level. Missing (m) and filled (f) teeth were recorded only if the cause was caries. The examination indicated the relevant tooth (DMFT, dmft), not tooth surfaces (DMFS, dmfs).

Data collection

Demographical features such as parent's age, educational level, family income, number of children were collected by means of a questionnaire. If both of the parents were in the examination, the highest educational level was recorded. Parents and children were also asked to complete a modified child health behaviour questionnaire as used in a study by Cinar and Murtomaa and Giammattei et al. [29,30]. The questionnaire involved questions about toothbrushing frequency and daily activities as seen below.

- Tooth brushing frequency (once daily, twice daily, more than once a week, never).
- Daily consumption of milk at breakfast and bedtimes on school nights: yes (favourable = 0), no (unfavourable = 1).
- When do you go to bed on school nights? By answering one these choices; 'I usually go to bed regularly on schooldays, at 20:30 to 22:00 o'clock or I usually go to bed irregularly on school nights.
- Leisure time activity; time spent watching TV, video or playing computer games per school day (ranging as none, 1 h, 2 h, 3 h, 4 h, 5 h or more).
- Consumption of snacks during leisure time activity; choices are: crisps-candies-chocolate-packaged food, fruits, all, none.

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics 25.0 Program (SPSS Inc., Chicago, IL). Mean and standard deviation or median (minimum–maximum) values were given for continuous variables. Categorical variables were expressed as frequencies and related percentage values. They were compared by the Chi-square test or Fisher's exact test. Comparison of continuous variables was performed with parametric (Student's *t*-test) or nonparametric (Mann–Whitney's *U*-test) tests according to their distribution type. DMFT/dmft of both groups were dichotomized into natural healthy teeth (DMFT = 0 + dmft = 0) and diseased teeth (DMFT > 0 + dmft > 0) subgroups. Correlation analysis was carried out to determine the effects of demographic and

life style habits on these subgroups of obese and non-obese children. The adjusted risk ratios were calculated with 95% confidence interval. A p value $<.05$ was considered to be statistically significant.

Results

Demographic and life style habits of the study groups are presented in Tables 1 and 2. No statistically significant difference was found between the two groups regarding gender, education level of the parent, family income, birth order and daily consumption of milk. The statistical differences between the groups were significant in terms of children's age, frequency of tooth brushing, time spent watching TV-video-playing computer games, consumption of food during leisure time activity and bedtimes on school nights. More than 50% of the children in obese group spent 3 h or more time for watching TV/video, whereas nearly half of non-obese children spent time for watching TV/video for up to 1 h a day ($p = .002$). While 34.9% of the obese children consume snacks, 42.2% of the children in the non-obese group did not consume anything during TV viewing ($p<.001$). Children in the obese group had more irregular bedtimes on school nights ($p = .001$). Educational level of parents in the obese group is higher than in the non-obese group, but the difference was not at a meaningful level ($p = .194$). Fifty-one percent of the non-obese children brushed their teeth at least once a day, while this ratio was 22% for the obese children. The frequency of tooth brushing was significantly higher in the non-obese group than in the obese group ($p<.001$).

Table 1. Demographic features of the parents and children.

	Obese group		Non-obese group		
	Mean ± SD, n	%	Mean ± SD, n	%	p Value
Parent's information					
Mother's age	36.47 ± 5.28		33.04 ± 3.90		<.001**
Father's age	40.22 ± 6.00		35.99 ± 5.38		<.001**
Educational level					
Primary	23	26.7	22	24.4	.194
Secondary	15	17.4	26	28.9	
Tertiary	48	55.8	42	46.7	
Family income					
Low	17	19.8	23	25.6	.562
Medium	54	62.8	55	61.1	
High	15	17.4	12	13.3	
Children's information					
Age	9.65 ± 2.06		7.68 ± 1.70		<.001**
Gender					
Girl	48	55.8	40	44.4	.132
Boy	38	44.2	50	56.6	
Birth order					
Singleton	9	10.5	13	14.4	.881
1st	41	47.7	40	44.4	
2nd	28	32.6	29	32.2	
3rd+	8	9.3	8	8.9	

**$p \leq .001$.

Table 2. Life-style habits of the study groups.

	Obese group		Non-obese group		
	Mean ± SD, n	%	Mean ± SD, n	%	p Value
Tooth brushing frequency					
Once daily	12	14.0	25	27.8	<.001**
Twice daily	7	8.1	21	23.3	
More than once a week	50	58.1	40	44.4	
Never	17	19.8	4	4.4	
Daily consumption of milk at breakfast					
Yes	45	52.3	48	53.3	.894
No	41	47.7	42	46.7	
Time spent watching TV, video, computer games on a school day					
None	1	1.2	8	8.9	.002*
1 hour	11	12.8	36	40.0	
2 hours	24	27.9	26	28.9	
3 hours	24	27.9	13	14.4	
4 hours	11	12.8	4	4.4	
5 hours+	15	17.4	3	3.3	
Consumption of food during TV-video viewing or computer games					
Packaged food-candy-crisp snacks	30	34.9	15	16.7	<.001**
Fruits	26	30.2	27	30.0	
All	14	16.3	10	11.1	
None	16	18.6	38	42.2	
Bed time on school nights					
Regularly at 20:30 to 22:00	57	66.3	79	87.8	.001**
Irregular	29	33.7	11	12.2	

*$p < .05$.
**$p \leq .001$.

Caries prevalence of the obese and non-obese groups was found as 69.0% and 68.5% in primary dentition and 38.4% and 17.8% in the permanent dentition, respectively. While statistically no difference was found in primary dentition ($p = .957$), there was a statistically significant association in the permanent dentition ($p = .002$). Caries experience of the study population is shown in Table 3. The caries status of the 1st molars (D_6) showed a statistically significant relationship between obese and non-obese group and the significance was higher in the obese group ($p = .005$). When D_6 was evaluated with age increase, there was a positive correlation in the control group ($r = 0.36$; $p<.001$), but no correlation was found in the obese group.

The dental examination showed that 31.4% (n= 27/86) of the obese and 25.6% (n= 23/90) of the non-obese children had healthy teeth, demonstrating no significant differences between the groups ($p = .390$). Table 4 presents the comparison of children classified as having healthy teeth and diseased teeth within each study group with regard to demographic characteristics and life style habits. Within both groups, family income and educational level of the parent did not show a significant difference between the children with healthy teeth and diseased teeth ($p = .591$; $p = .108$; $p = .523$; $p = .098$). Also, it was determined that children who had diseased teeth were found to consume more food during TV viewing than children who had healthy teeth. Although the difference was remarkable, it was not statistically significant ($p = .122$; $p = .096$).

When we evaluated the children with healthy natural teeth between obese and non-obese group according to education level, family income and consumption of food during TV viewing, no differences were found in primary dentition ($p = .297$; $p = .652$; $p = .023$), but there was a significant difference regarding consumption of food when viewing TV in permanent dentition; the number of healthy natural teeth was higher in non-obese group ($p = .670$; $p = .561$; $p = .008$).

It was found that dental caries in the group of obese children was more frequent than the group of non-obese in

Table 3. Caries experience of the study population.

	Obese group (n= 86), n	Non-obese group (n= 90), n	p Value
Number of children with any primary caries; dmft > 0 (n/%)	40 (69%)[a]	61 (68.5%)[b]	.957
Number of children with any permanent caries; DMFT > 0 (n/%)	33 (38.4%)	16 (17.8%)	.002*
dmft	2.24 ± 2.25[c]	3.15 ± 3.23[c]	.225
DMFT	1.09 ± 1.82[c]	0.37 ± 0.9[c]	.001*
Number of children with natural healthy teeth; dmft = 0 + DMFT = 0 (n/%)	27 (31.4%)	23 (%25.6%)	.390
Number of children with diseased teeth; dmft > 0 + DMFT > 0 (n/%)	59 (68.6%)	67 (74.4%)	
D_6 (caries of 1st permanent molar)	0.71 ± 1.19[c]	0.28 ± 0.73[c]	.005*

[a]Obese group dmft n = 58 (40/58).
[b]Non-obese group dmft n = 89 (61/89).
[c]Mean ± SD.
*p<.05.

Table 4. Comparison of children with natural healthy teeth and diseased teeth within study groups in terms of gender, demographic characteristics and life-style habits.

	Obese group (n= 86)			Non-obese group (n= 90)		
	With natural healthy teeth (n = 27), n/%	With diseased teeth (n = 59), n/%	p Value	With natural healthy teeth (n = 23), n/%	With diseased teeth (n = 67), n/%	p Value
Gender						
Girl	17/35.4	31/64.6	.366	10/25	30/75	.914
Boy	10/26.3	28/73.7		13/26	37/74	
Birth order						
Singleton	3/33.3	6/66.7	.581	5/38.5	8/61.5	.595
1st	15/36.6	26/63.4		10/25	30/75	
2nd	6/21.4	22/78.6		7/24.1	22/75.9	
3rd+	3/37.5	5/62.5		1/12.5	7/87.5	
Educational level of parents						
Primary	8/34.8	15/65.2	.591	2/9.1	20/90.9	.108
Secondary	6/40	9/60		9/34.6	17/65.4	
Tertiary	13/27.1	35/72.9		12/28.6	30/71.4	
Family income of parents						
Low	5/29.4	12/70.6	.523	2/8.7	21/91.3	.098
Medium	19/35.2	35/64.8		17/30.9	38/69.1	
High	3/20	12/80		4/33.3	8/66.7	
Tooth brushing frequency						
Once daily	3/25	9/75	.642	8/32	17/68	.855
Twice daily	3/42.9	4/57.1		5/23.8	16/76.2	
More than once a week	4/28	36/72		9/22.5	31/77.5	
Never	7/41.2	10/58.8		1/25	3/75	
Time spent watching TV, video, computer games on a school day						
None	1/100	0	.106	5/62.5	3/37.5	.014*
1 hour	4/36.4	7/63.6		9/25	27/75	
2 hours	7/29.2	17/70.8		7/26.9	19/73.1	
3 hours	8/33.3	16/66.7		0	13/100	
4 hours	0	11/11		0	4/100	
5 hours+	7/46.7	8/53.3		2/66.7	1/33.3	
Consumption of food during TV-video viewing or computer games						
Packaged food candy-crisp snacks	8/26.7	22/73.3	.122	2/13.3	13/86.7	.096
Fruits	6/23.1	20/76.9		8/29.6	19/70.4	
All	4/28.6	10/71.4		0	10/100	
None	9/56.3	7/43.8		13/34.2	25/65.8	
Daily consumption of milk at breakfast						
Yes	13/28.9	32/71.1	.600	11/22.9	37/77.1	.539
No	14/34.1	27/65.9		12/28.6	30/71.4	
Bedtime on school nights						
Regularly at 20:30 to 22:00	18/31.6	39/68.4	.959	21/26.6	58/73.4	.722
Irregular	9/31.0	20/69		2/18.2	9/81.8	

*p< .05.

primary dentition. However, this difference was not statistically significant (OR = 2.083; 95% CI = 0.5–1.20; p = .957). The risk of dental caries for obese children in permanent dentition was 5.761. The statistical difference between two groups was significant (OR = 5.761; 95% CI = 1.439–2.880; p = .003).

Discussion

The present study was conducted to investigate the evidence of an association between obesity and dental caries in a sample of Turkish Elementary school-aged children. The findings showed an association in the permanent dentition, but no relationship in the primary dentition. This study shares similar results which is reported by Kopycka-Kedzierawski et al., analysing data from the NHANES III [31].

Many studies have been conducted up to date and Tuomi [21], as a forerunner, indicated a positive relationship between an increase of dental caries and obesity, and many researchers supported this association in their studies carried out in different countries worldwide [10–16,26,32]. In

contrast, other studies could not verify the existence of an association between these two diseases [17–20]. Beyond these articles, in some studies, a consistent data could not be obtained. While Gerdin et al. [15] found a relationship but limited association, Hong et al. [22], reported a correlation but not at a significant level. On the contrary, Hayden et al. [33], in their systematic review and meta-analysis from papers between 1980 and 2010, demonstrated a significant positive relationship between obesity and dental caries, particularly in the permanent dentition as parallel to the results arising from this case-controlled study.

Obesity occurs as a result of unhealthy nutrition which might lead to obesity and caries at the same time. However, obesity alone could not be a crucial predictor for dental caries, it should be evaluated together with contributing factors which also play a role in caries. The most prominent common risk factor that influences the emergence of both diseases is SES (i.e. education level and family income). Elger et al. [32] found a significant decrease in caries status with increasing SES and stated that obesity must be evaluated with this parameter. Marshall et al. [20], in their study evaluating the relationship between obesity and dental caries, stated that children with caries experience had less educated parents and lower family incomes. However, in the present study, an association could not be demonstrated between the children with caries or healthy teeth within the two study groups as well as between obese and non-obese children with healthy teeth in terms of education level of the parents and family income. These data are consistent with the observations of Hong et al. [22] and Macek and Mitola [18] who also could not find an association between caries and obesity in terms of family income.

Life-style behaviour which is a modifiable risk factor, affects the chance of getting a disease, also contributes to the association between obesity and dental caries. Regarding daily activities and life-style habits such as TV viewing duration, consuming food while watching TV, bedtimes and tooth brushing habit, the age range in which the children are included in this study is an important age group who show a transition from being young to older, from home to school and who will start to become more independent. Their change in social environment and the absence of parental control over diet during school hours and the existence of peer influence will affect caries and obesity risk and track to life long. As children get older, increased TV watching time disrupts habitation and influence eating, resulting in increased energy intake [34], especially snack consumption which is mostly consisting of sweetened or fermentable carbohydrate foods [35]. This sedentary behaviour later leads to increased risk of obesity and also dental caries since this type of sticky foods are more in contact with the teeth [35]. Controversial to the given knowledge, in the present study, there was no statistically significant difference between children with diseased and healthy teeth within the study groups regarding TV viewing time and eating habit during TV viewing. Considering the methodology of this study, food consumption only at home hours has been examined, so the family control is inevitable. Cinar et al. [36] in their study clustering obesity and dental health with lifestyle factors, stated that Turkish pre-adolescents who were more likely to watch less TV prefers more frequently to eat fruits between meals, which is traditional in families to serve fruits after dinner and to regulate the time spent on TV viewing by their children. They concluded that interaction patterns of the Turkish family could have a positive effect on dental health of pre-adolescents in terms of these habits. In the present study, the positive effect was higher in the children with healthy teeth of non-obese group compared with the obese group according to the food consumption during TV hours in permanent dentition. This was the expected result due to presence of less TV hours and less eating harmful snacks in non-obese group.

Alm et al. [12], in their study of survey on oral health in children followed from the ages of 1 year to 15 years, collected information about snacking habits of children from interviews at 1 and 3 years. They found that consumption of snacking products at an early age was associated with approximal caries at 15 years. Hilgers et al. [16], reported an association between increased BMI and an increased incidence of permanent molars' interproximal caries, but no difference between BMI and overall caries in their study conducted on US schoolchildren aged 8–11 years. In the present study, mean caries average of first permanent molars in obese children was found significantly higher than those in non-obese children. This overall higher rate in obese group can be thought to be positively correlated with higher age-average of obese children, but no correlation was found when evaluated D_6 with age increase.

Since past life-style habits and caries cannot be detected in cross-sectional studies, only data belonging to that moment are evaluated; however, tooth decay emerges from long-lasting bad habits. This condition was observed in a longitudinal study performed by Gerdin et al. [15]. They evaluated the reflection of the child's weight status on dental health with intermittent ages ranging from 4 to 10 years of age and found, however weak, an association between obesity and dental caries. They stated that children who were overweight/obese at age 4 and remained overweight/obese at older ages, had significantly more approximal caries surfaces than children with normal weight at all intermittent ages. It is more likely to reach a relationship between the two diseases at later ages. Thus, this may explain the result of this study that showed an association in permanent dentition.

Conflicting results in the studies may be related to study populations, and variability of evaluation criteria. Comparing the studies of different age groups can lead us to make false conclusions. Majority of the studies were conducted on either pre-school children, or children aged 10–14 years-old where only one dentition was assessed; primary or permanent dentition by evaluating and comparing the DMFT/dmft mean values, prevalence ratios or odds ratios [13,26,37]. Since this study was conducted on children with ages 6–11 years, both primary and permanent dentitions were able to be evaluated. It was preferred to assess the presence of healthy teeth in the evaluation of caries instead of DMFT/dmft mean values due to the fact that the comparison of

dmft/DMFT mean in mixed dentition is not highly accurate because of existing the wide range of age and the duration of the teeth in mouth. Among the few studies in the literature in this age group, Willerhausen et al. [10] found a positive relationship by concerning DFT/dft mean values between obesity and dental caries; however, Macek and Mitola [18] could not ascertain an association by comparing the caries prevalence of both groups.

There is also a methodological heterogeneity among studies. In the literature, the majority of the studies were diagnosed as cross-sectional community survey, which took place in a school setting or conducted in dental clinics or used data from large national survey archives. Children were evaluated by categorizing according to the BMI index. There may be a limitation in ability of identifying the effect of causative factors on the obesity-caries relationship in these studies [20]. In this study, differently as abovementioned study designs, a case-control method is preferred in which the cause–effect relationship was evaluated rather than determining the status of the diseases in the population. The only case-control research met in the literature survey is the study of Bailleul-Forestier et al. [26], conducted on 41 obese adolescents matching by age, gender and SES with controls. In the present study, the groups have not been matched in order not to eliminate demographic confounders. In addition, extreme high attention has been paid when selecting the control patients. The patients were chosen from clinics that do not interfere with any sort of dental problems and systemic diseases.

According to the study design and the given results, it can be concluded that an association was found in caries experience between obese and non-obese children in the permanent dentition, whilst no evidence was detected in the primary dentition. Likewise, there was no remarkable difference within the study groups in terms of demographic and lifestyle factors when evaluated for caries experience.

Despite all these assessments, this study had also limitations. In the study, only demographic characteristics, and self-reporting dietary, and life style data were analysed for the evaluation of the relationship between caries and obesity. Unfortunately, age matched controls could not be obtained because of random and synchronous subject selection in a limited period of time. Familial disposition has to be taken into account for genetic prediction.

The mechanism by which obesity is associated with dental caries is very difficult to define. Early diagnosis of etiologic, clinical and life-style factors which are related to obesity, and healthy establishment of these factors as children grow, may reduce the risk of dental caries which has common risk factors with many noncommunicable diseases. Considering that there are still deficiencies and conflicting results in the literature, further longitudinal comprehensive and controlled studies are needed in order to reach ultimate and clear results.

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Ethics

This study was undertaken in compliance with the guidelines of the Declaration of Helsinki and it was approved by the local ethics committee of the Dr. Behcet Uz Children's Hospital (2012/10). The participants signed an explicative authorization document of their own free will before enrolment in the study. The author of this study declares that there have been no conflicts of interest and any financial agreements with pharmaceutical or biomedical firms whose products are pertinent to the subject matter dealt within the manuscript.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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