STUDY ON DIETARY HABITS OF FIRST GRADE SCHOOLCHILDREN IN IASI, ROMANIA

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ABSTRACT

The aim of the present study was to investigate the dietary habits of first grade schoolchildren in Iasi, Romania. Material and methods : The study cross-sectional included 200 children aged 6-7 years, attending schools in various districts of Iasi town, Romania. A 20-item questionnaire, completed by the children and their parents was used. Results: 51% of the subjects reported between meals sugar intake. The consumption of fresh vegetables was reported by 74.5% of the children, mostly once a day (52.5%). The frequency of fruits daily consumption was 2 times/day for most of the participants in the study (43%). 21.5% of the children reported no consumption of milk or dairy products. Conclusion: The results of the study underline the need for effective oral health education, addressed to children, parents and educators.

Key words: caries prevention, diet, schoolchildren.

INTRODUCTION

Dental caries is a multifactorial disease that occurs in the complex environment of the oral cavity. Fermentable carbohydrates are known substrates for acido-genesis by cariogenic bacteria (1). The associations between dental caries and dietary risk factors have been examined for several decades (2, 3). Conclusive evidence supports the association between sugars intake and dental caries, and control of sugars intake is an effective factor in preventing dental caries. Although caries prevalence has declined in developed countries in the last decades, changing life-styles and dietary patterns have led to a marked increase in caries incidence in developing countries (4-7). Dietary habits have shifted in all age groups, including a nearly doubled intake of energy-dense, low-nutrient dense snack foods. The shifted dietary patterns have been associated with increased risk of endemic diseases such as type 2 diabetes, obesity and dental caries (8).

The aim of the present study was to assess the dietary habits of schoolchildren aged 6-7 years from Iasi town, Romania, in

order to obtain a picture of this risk factor for dental caries.

MATERIAL AND MEHODS

The study was cross-sectional descriptive type and included 200 children (55% female and 45% male) aged 6-7 years, attending schools in various districts of Iasi town, Romania. Informed consent was obtained from the parents prior to the beginning of the investigation. The children also had the possibility to refuse participation to the study.

The children were clinically examined in the dental offices of the selected schools to assess oral health status. A 20-item questionnaire was used to assess the dietary habits of the children. The questionnaires were completed by the parents and included questions referring to dietary preferences, number of meals and snacks per day, fruits and vegetables intakes per day, consumption of milk and dairy products, as well as the educational status of the parents. The questionnaire was previously tested, validated and used in a larger group of schoolchildren of the same age in Iasi. Data were analyzed using the SPSS 20.0 for Windows.

RESULTS

Most of the parents (46%) of children in the study had a medium educational status, 37% had a high educational status and 17% - a low educational status.

The number of meals per day was variable in the study group: 69% of the children reported a number of 3 main meals per day, 25% - 2 meals per day and 6% - 1 meal per day (table 1). The distribution of the main meals was variable, too: 1% had breakfast and lunch, 1% had breakfast and dinner, and 23% had lunch and dinner.

86.5% of the investigated children reported they had snacks between meals (table 1): 85.5% of these had 0 to 3 snacks per day, 12.5% had 4 to 5 snacks per day and 1% - more than 5 snacks per day.

Table 1. Number and distribution of the main meals and snacks per day in the study group

Number and distribution of main meals/snacks	*Number of subjects*	*% subjects*
1 meal	12	6
2 meals	50	25
Breakfast and lunch	2	1
Breakfast and dinner	2	1
Lunch and dinner	46	23
3 meals	138	69
0-3 snacks	171	86.5
4-5 snacks	25	12.5
>5 snacks	2	1

56% of the subjects said they preferred hard foods.

98% of the investigated children admitted they liked sweets. Of these, 60.5% preferred chocolate, 25% - cakes, 7.5% - toffees and 7% - candies. As to the moment of sweets consumption, 51% of the subjects reported between meals sugar

intake, 28% - at lunch and 20% - at dinner (table 2).

Table 2. Sweets preferences in the study group

	Number of subjects	***% subjects***
Sweets preferences		
Chocolate	120	60.5
Cakes	49	25
Toffees	14	7.5
Candies	13	7
Moment of sweets consumption		
Between meals	101	51
At lunch	51	28
At dinner	39	20

The consumption of fresh vegetables was reported by 74.5% of the children in the study (table 3). 19% declared they preferred carrots, 17% - tomatoes, 1% - peas, 2% - cabbage, 8.5%- others and most of the respondents (52.5%) – combinations of vegetables. The frequency of vegetables consumption per day varied from once a day (52.5%) to 4 times / day (3%).

Almost all of the subjects (94.5%) liked fruits (table 3). 75% preferred combinations of fruits instead of a single kind, 12.5% preferred apples, 6% - bananas, 4% - oranges and 2.5% - others. The frequency of fruits daily consumption was 2 times/day for most of the participants in the study (43%), 1time/day for 39% of them, 3 times/day for 8% and 4 times/day for 6% of them.

Table 3. Consumption of fresh vegetables and fruits in the study sample

	Number of subjects	***% subjects***
Do you eat fresh vegetables?		
Yes	149	74.5
No	51	25.5
What kind of vegetables do you prefer?		
Carrots	38	19
Tomatoes	34	17
Peas	2	1
Cabbage	4	2
Others	17	8.5
Combination of vegetables	105	52.5
How many times/day do you eat vegetables?		
0 times/day	12	6
1 time/day	105	52.5
2 times/day	69	34.5
3 times/day	8	4
4 times/day	6	3
Do you like fruits?		

Yes	189	94.5
No	11	5.5
What kind of fruits do you prefer?		
Apples	25	12.5
Bananas	12	6
Oranges	8	4
Others	5	2.5
Combinations of fruits	150	75
How many times/day do you eat fruits?		
0 times/day	8	4
1 time/day	78	39
2 times/day	86	43
3 times/day	16	8
4 times/day	12	6

Intake of milk and dairy products had a frequency of 1time/day for 55.5% of the children included in the study, 2 times/day for 19.5% of them, 3 times/day for 2.5% and more than 3 times/day for 1% of the subjects. 21.5% of the respondents declared no intake of milk (table 4). Consumption of white bread was declared by 65% of the subjects, while the others reported intake of another kind of bread: rye (19%), buckwheat (6%), whole meal (10%).

Table 4. Intake of dairy products and bread in the study sample

	Number of subjects	***% subjects***
How many times/day do you drink milk or eat dairy products?		
0 times/day	43	21.5
1 time/day	111	55.5
2 times/day	39	19.5
3 times/day	5	2.5
>3 times/day	2	1
What kind of bread do you eat?		
White bread	130	65
Rye bread	38	19
Buckwheat bread	12	6
Whole meal bread	20	10

DISCUSSION

Of the many factors that contribute to the development of dental caries, diet plays an important role. Fifty years ago dietary issues relevant to dental caries were largely concerned with dietary sugars. Although sugars are undoubtedly the most important dietary factors in the etiology of dental caries, today's diet contains an increasing range of fermentable carbohydrates, including highly processed starch-

containing foods and foods that contain novel synthetic carbohydrates such as oligo fructose, sucralose, and glucose polymers. Sucrose for years was billed as the "arch criminal" of dental caries because it was considered to be so much more cariogenic than other sugars. However, later research has suggested that the differences between sucrose and the various monosaccharides in terms of cariogenic potential are less than originally believed.

Many studies point to the frequency of eating sugars to be of greater etiological importance for caries than the total consumption of sugars. The primary evidence comes from the Vipeholm study (9).

The objective of the WHO guideline is to provide recommendations on intakes of free sugars to reduce risks of noncommunicable diseases in adults and children, with a focus on the prevention and control of unhealthy weight gain and dental caries. The WHO recognized that dental diseases are the most prevalent noncommunicable diseases globally and that the treatment of dental diseases is expensive, exceeding the entire financial resources available for the health care of children in most lower-income countries. WHO recommends a reduced intake of free sugars throughout the lifecourse (*strong recommendation*). In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake (*strong recommendation*). WHO suggests a further reduction of the intake of free sugars to below 5% of total energy intake (*conditional recommendation*) (10-12)

For some decades, a linear relationship between sugar consumption and caries experience has been observed and restricting sugar intake has played an important role in caries prevention. More recent data, however, has indicated that this relationship is not as strong as it used to be before the widespread use of fluoride. A recent systematic review aimed to answer the question "In the modern age of extensive fluoride exposure, do individuals with a high level of sugar intake experience greater caries severity relative to those with a lower level of intake?". After the assessment and categorization of 36 manuscripts according to the strength of association, the authors concluded that the relation between sugar and caries is much weaker than it was before the fluoride era. Clearly, with the advent of fluoride in drinking water and in toothpastes, a higher cariogenic diet can be tolerated before caries occurs in many individuals. However, fluoride has its limits, and caries remains a serious problem, especially for economically disadvantaged individuals, since in this group sugar consumption is increasing but fluoride use has not been widely adopted (13, 14).

Milk and milk products are a group of foods that must be a priority in child feeding. They are rich in nutritious protein, group A and B vitamins and easily assimilated calcium, crucial to dental health. (15). However, the consumption of milk and dairy products was low in the studied group, as most of the children declared a frequency consumption of 1 time/day and more than 20% of the children did not consume such products at all.

The consumption of fruits and vegetables in the study group were less than the recommended ones, too. This is a disturbing fact, as this food group in the food pyramid is rich in all group B

vitamins and all water-soluble vitamins, including vitamin C. Vegetables are richer in water-soluble vitamins. Fruits are indispensable food, rich in vitamins, minerals and organic acids.

What is most important for caries prevention is controlled sugar intake. It has been shown that when the intake of free sugars is less than 15 kg per person per year, the level of dental caries is low. Global recommendations encourage diets with a high content of fruits, vegetables and a low content of added sugars and fats for the protection of oral and general health.

The risk of caries is highest if sugar confectionery is consumed most frequently and is in a form that is retained in the mouth for a longer period of time. Guidelines in training parents and advising children include diets that avoid frequent consumption of juice or other sugar-containing products that cause tooth decay, and promote healthy eating habits consistent with the Food Guide Pyramid.

Food consumption affects the state of the teeth, the most significant effect being the local effect of food containing free sugars on the tooth surface and development of caries and erosion. The frequency of intake of such foods should be limited to a maximum of four times a day. It is the responsibility of the national authorities in each country (16). Consultations regarding food diet are one of the key factors in the prevention of dental caries and reducing the risk of its development. The specific recommendations for each child should be given after diagnosing any food deficiencies and/or excesses in their regular food regime, and alternatives should be provided.

Complex actions such as the European Commission 'School Fruit' Scheme and the amendments for offering healthy foods in schools and kindergartens will in time create a healthy food model for children.

CONCLUSION

The diet of the investigated schoolchildren includes more sugars and less fruits and vegetables than the recommended guidelines for caries prevention. The results of the study underline the need for effective oral health education, addressed to children, parents and educators.

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