COMPARATIVE ANALYSIS OF VITAMIN STATUS OF SCHOOLCHILDREN IN RECREATIONAL PERIOD

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Annotation. It is a comparative analysis of the characteristics of the vitamin status of schoolchildren during the summer recreation of 90th years of the last century and now. The study involved 167 schoolchildren aged 11-14 years. With the help of questionnaires developed by the authors assessed the severity of symptoms of vitamin deficiency, the prevalence of vitamin supplementation, frequency and volume of consumption of fruits and vegetables. It is confirmed that the saturation is the state of the vitamin in children is the best compared with data from 20 years ago, the state of multi-vitamin deficiency is replaced mono-vitamin deficit. The results, data evaluation and the availability of additional fortification of the diet of fruit and vegetables support the need for measures aimed at improving vitamin status. Using the questionnaire method is most appropriate for monitoring the vitamin status of schoolchildren.
Keywords: schoolchildren, vitamins, status, recreation.

Introduction

Positive influence of recreational rest and health improvement on human functional state preconditions significance of its correct organization for improvement of population's health [1]. Health related eating, ensured owing biologically active additions', first of all vitamins', introductions into ration, takes substantial place among factors, composing recreational complex [2,3]. Study of alimentary factor from these positions is based on its main functions, facilitating recreation and rising of human workability. It is connected with main peculiarity of eating – its irreplaceability for ensuring of normal functioning of organism's systems and organs. Only consumption of food provides person with biologically and physiologically active substances, permitting to realize all necessary functions, to fulfill production and study works, connected with loads [4].

Results of the researches prove vitamin-deficit states' prevalence among population, which are promoted by complex of reasons of ecological, social-economic and psychological character [4,5]. Hypovitaminosis is one of key links of patho-genetic mechanism of reduction of organism's immune potential, which cause disbalance and reduction of homeostasis' stability [6]. The existing situation conditions demand in monitoring of vitamins content in organism, results of which can be used both: as criteria of recreation's effectiveness and for analysis of functional state's dynamics.

Purpose, tasks of the work, material and methods

The purpose of the present work is comparative analysis of peculiarities of pupils' vitamin status with the help of questioning during summer recreation at present time and in 90-s of the last century.

Materials and methods of the research: in the work we used results of questioning of 167 11-14 years old pupils, who were divided into two groups: 1- 106 children, examined in summer 1993-1994, 2nd – 61 children, examined in summer 2013.

For achievement of our purpose we used developed by us questionnaires, which included main symptoms of vitamin insufficiency, conventionally divided into three groups: non-specific and specific signs of hypovitaminosis's initial stage and signs of expressed hypovitaminosis's stage. Besides, questionnaires included questions about additional taking of vitamins, ratio and amount of taken food – their main sources [4,7]. The results were processed with the help of licensed packages of electronic tables Excel, with application of descriptive statistics' indicators and determination of differences' confidentiality (of different groups) by Stjudent's criterion [8].

Results of the researches

Analysis of questionnaires permits to speak about certain changes of dynamics of pupils' vitamin status in the process of observation. For example, in 90-s the status of most of the examined was appraised as poly-hypovitaminosis, owing to signs of some vitamins' deficit: 8.,8% of respondents noticed symptoms of ascorbic acid deficit, 54.7% – of retinol, 36.8% – of pyridoxine, 59.4% – -of thiamine, 45.3% – of riboflavin, 55.7% – of niacin [7]. At the same time results of 2013 permit to assume certain optimization of vitamin status. For example, 32.79% of the 2nd group questioned did not note signs of vitamin deficit at all. Other questioned most often noted 1-2 symptoms of vitamin deficit that can be appraise as little expressiveness of disorders. The data about prevalence of some symptoms of vitamin deficit are given in table 1.

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Table 1

Prevalence of some symptoms of pupils' vitamin deficit

Signs of hypovitaminosis	1 group	2 group
Quick tiredness	22.60±4.06	8.20 ±3.51*
Somnolence	15.00 ±3.47	13.11 ±4.32*
Irritability	25.50±4.23	16.39±4.74
Bad eyesight in poor light	26.40 ±4.28	4.92 ±2.77*
Unpleasant taste in mouth	27.40 ±4.33	8.20 ±3.51*
Disorders of sleep and appetite	11.30±3.08	9.84±3.81
Weakness, cachexy	21.70 ±4.00	1.64 ±1.63*
Edema, hyperaemia of gums	44.7 ±4.83	3.28 ±2.28*
Gums' bleeding with brushing of teeth	27.40 ±4.33	9.84 ±3.81*
Cross striation of nails	9.40 ±2.83	0
Cheilosis of lips	36.80 ±4.68	0
Frequent rhinitis	25.50 ±4.23	11.48 ±4.08*
Gums' bleeding	36.80 ±4.68	4.92 ±2.77*
Increased sensitivity of feet to cold	8.50 ±2.71	0
Reddening and interstice of tongue	3.80 ±1.86	0
Slight bruises	8.50±2.71	8.20±3.51
Sickness without reason	17.90 ±3.72	1.64 ±1.63*

* - differences are confident ($p<0.05$)

The obtained results prove our assumption concerning improvement of vitamin status of pupils' organisms in 2013, in comparison with 90-s of the last century. Non-specific signs of hypovitaminosis (quick tiredness, somnolence, general weakness, cachexy) are much rarer, ($p<0,05$). The same picture takes place with comparing of such specific vitamin deficit's symptoms as edema, gums' hyperaemia and bleeding, bleeding with brushing of teeth. Pupils of 2nd group have much less these signs that reflects sufficient quantity of ascorbic acid in organism. Such sign as increased feet's sensitivity to cold is completely absent, that shall be appraised as improvement of capillaries' functioning owing to optimization of vitamin C status.

Practically five times less there is worsening of eyesight in poor light that can be interpreted as evidence of sufficient level of retinol in organism. Concerning insufficiency of group B vitamins (thiamine, riboflavin, pyridoxine and niacin), besides confident reduction of prevalence in 2nd group of such symptoms as unpleasant taste in mouth, frequent rhinitis, dizziness without reasons, we state complete absence of such signs as cross striation of nails, cheilosis of lips, reddening and interstice of tongue. It proves sufficient status of these vitamins in organism.

At the same time in examined groups there was noticed absence of confident differences y such symptoms as irritability, disorders of sleeping, appetite, slight bruises, which reflect both non-specific and specific signs of vitamin insufficiency. It proves our previous assumptions and permits to consider the state of modern pupils not to be completely satisfactory in the sense of organism's vitamin status and requires some measures, directed for its correction.

Provision of required vitamin-content in food without increasing of its energetic value is possible only with additional vitamin fortification [4]. Basing on this assumption we carried out comparative analysis of vitamins' taking, results of which are presented in table 2.

Table 2

Pupils' additional vitamins' fortification

Signs	1 group	2 group
All year round taking	12.30 ±3.19	1.75 ±1.74*
Season taking (winter-spring)	18.90 ±3,.80	15.79 ±4.83
Irregular taking	5.60 ±2.22	22.81 ±5.56*
No taking	63.20 ±4.68	56.14 ±6.57

* - differences are confident ($p<0.05$)

The most significant, in our opinion, result is that both in 90-s of the last century and now more than half of the examined pupils did not take vitamins at all. This fact not only indirectly witnesses about wide prevalence of vitamins' deficit, but also characterizes low level of hygienic culture of rising generation. The quantities of respondents, who took vitamins in winter-spring period (season taking) was rather stable, but concerning those, who noted all year round taking - situation was quite opposite. Specific weight of pupils, taking vitamins all year round in 90-s was confidently higher than at present, though the quantity of people in this group exceeded the present one only by 10%. At the same time children, who take vitamins irregularly are greater in number now than in 90-s; their quantity is more than 20%. In our opinion these results reflect both insufficient level of hygienic knowledge of children population and absence of active health related behavior. At present time information basis of children, teen-agers and youth about problems of

health-related eating is recognized as one of main components of healthy life style [4,9,10]. Exactly this fact gives ground to recommend work on propaganda of additional vitamins' taking as one of measures, oriented on health improvement.

One more proof of this assumption can be analysis of answers to question of questionnaire, in which it was offered to point, which exactly vitamins were taken by a respondent. Great majority simply did not answer this question; among available answers there were vitamins' complexes (undevit, complevit) and separate preparations (ascorbic acid) and, sometimes, preparations, which do not belong to vitamins (calcium, iodomarine and other).

Concerning ratio of vegetables and fruit, as main sources of vitamins, in diet it was established that at present time more than half of the examined take fresh vegetables everyday and oftener than once a day, accordingly (22.95±5.38)% and (32.79±6.01)% of pupils. Concerning fruit-eating situation is also optimistic – they are eaten everyday by (33.3±6.09)%, oftener than once a day - (55.00±6.42)%. Great attractiveness of fruits for pupils is characterized also by the fact that (18.03±4.92)% of the examined declared that they never eat vegetables, in relation to fruits there was no such answer. But, at the same time the volume of taken fruits and vegetables is far from the quantities, recommended for healthy eating [4,10]. Only 10% of the examined answered that they eat them more than 400 grams a day or within 300 – 400 grams. Specific weight of persons, in diet of which there is less than 100 grams, was (21.67±5.32)%, besides (35.00±6.16)% noted eating at the level of 101-200 grams a day. The presented data one more prove the presence of risk of disordering of pupils organisms' vitamin status and condition the need in special correction measures.

Conclusions:

Analysis of dynamics of pupils' vitamin status in recreation period permits to conclude that at present time children's vitamin status can be appraised as optimal, in comparison with the data of 20 years prescription owing to less expressiveness of vitamin-deficit's symptoms, increasing of specific weight of persons, who have no such symptoms at all. However, stability of some non-specific and specific signs of hypervitaminosis, requiring special correcting measures, causes certain vigilance. Results of estimation of additional vitamins fortification and availability vegetables and fruits in diets also prove demand in purposeful measures, oriented on improvement of vitamin status. In order to carry out monitoring of vitamin status, it is the most purposeful to use the method of questioning, which permits quickly, sufficiently effectively and purposefully from financial point of view (in screening mode) to study, to determine the most frequent signs of vitamin-deficit, to ground prevention and health related measures.

The prospects of further researches in this direction: we consider urgent the continuation of this direction with expansion of arsenal of methodic, with application of objective methods for appraisal of vitamin status , methods, which have screening character.

References:

1 Zajcev V. P., Prusik Kr., Manucharian S. V. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2011, vol.1, pp. 66 – 74.

2 Partas I.G., Tereshchenko I.V., Zubenko I.V. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2008, vol.6. pp. 262-264.

3 Podrigalo L.V., Pashkevich S.A., Prusik Kr. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2012, vol.6. pp. 83-87.

4 Martinchik A.N., Maev I.V., Ianushevich O.O. *Obshchaia nutriciologiia* [General nutriciology], Moscow, MEDpress-Inform, 2005, 392 p.

5 Podrigalo L.V., Nazarian R.S., Filatova N.M. *Vrachebnaia praktika* [Medical practice activities], 2007, vol.1 (55), pp. 103-107.

6 Novikov V.S., Deriapa N.R. *Bioritmy, kosmos, trud.* [Biorhythms, space, work], Sankt Petersburg, Science, 1992, 256 p.

7 Podrigalo L.V. *Vitaminnyj status kak kriterij prognozirovaniia zdorov'ia detej i podrostkov* [Vitamin status as a criterion for predicting the health of children and adolescents], Kharkov, 1996, pp. 220-222.

8 Lapach S.N., Chubenko A.V., Babich P.N. *Statisticheskie metody v mediko-biologicheskikh issledovaniiakh s ispol'zovaniem Excel* [Statistical methods in biomedical research using Excel], Kiev, Morion, 2000, 320 p.

9 Nevin Sanlier, Ece Konaklioglu. Food safety knowledge, attitude and food handling practices of students, *British Food Journal*, 2012, vol.114(4), pp. 469 – 480.

10 James W.P.T. et al. *Healthy nutrition: preventing nutrition-related disease in Europe*. Copenhagen, WHO Regional Office for Europe, 1998 (WHO Regional Publications, European Series, No.24. p. 139-150.

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