VITAMIN D DEFICIENCY AND STRUCTURAL AND FUNCTIONAL STATE OF BONE TISSUE IN SCHOOLCHILDREN OF UKRAINE

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Keywords: *vitamin D, bone mineral density, schoolchildren*

Objectives. Vitamin D is an essential material in bone metabolism, and regulation of body minerals. Vitamin D deficiency has various causes, including limitations in sunlight exposure (type of clothing, sunscreen usage, indoor activity), seasonal geographic latitude and altitude, atmospheric pollution, diet, and aging.

Aim. The aim of the work was to determine the frequency of vitamin D deficiency among Ukrainian schoolchildren and it’s

influence on bone mineral density.

Materials and methods. There were examined 304 children aged 10-18 years. The boys consisted 55.0%. The average age of boys was 12.9±0.2 and girls – 12.4±0.2 yr. old. The study was performed within two months – October and November 2011, to exclude the influence of seasonal factors on the level of 25(OH)D. Researches included ultrasound densitometry of calcaneus by SAHARA (Hologic), blood chemistry, 25(OH)D and intact parathyroid hormone (iPTH) in plasma were determined by Elecsys 2010. Also, it was evaluated the average content of calcium and vitamin D in the diet form the products consumption frequency questionnaire.

Results. Vitamin D deficiency was founded in 92.2% of schoolchildren, and vitamin D insufficiency was diagnosed in 6.1% of cases. Secondary hyperparathyroidism was verified in 0.9% of children. The average level of consumption of calcium and vitamin D in children was below recommended data, and consisted (Me 649 [488.7; 691.86]) mg/day for calcium and (Me 68.69 [58.45; 117.3]) IU/day for vitamin D. Children with vitamin D insufficiency had significantly higher data of structural and functional state of bone tissue in comparison with the data of pupils with severe deficiency of vitamin D: stiffness index 105.03±6.12 vs. 93.7±2.51% ($p<0.02$); BMD 0.574±0.024 vs. 0.528±0.019 ($p<0.02$) and speed of sound 1573.61±6.70 vs. 1557.2±5.41 ($p<0.01$).

Conclusions. High level of vitamin D deficiency (92.2%), secondary hyperparathyroidism (0.9%), low data of ultrasound densitometry in severe vitamin D deficient children make doctors to research the effective methods of treatment and prophylactics of revealed disorders.

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NIEDOBÓR WITAMINY D A STAN STRUKTURY I FUNKCJONALNOŚCI KOŚCI U

DZIECI W WIEKU SZKOLNYM NA UKRAINIE

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Słowa kluczowe: *witamina D, gęstość mineralna kości, dzieci szkolne*