

STRUCTURAL-FUNCTIONAL STATE OF BONE IN MEN OF DIFFERENT AGE

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This research was aimed at studying the age-dependent peculiarities of bone mineral density and bone mineral content in men.

Research object: The total of 210 men 20–89 years old ($54,6 \pm 1,2$) were examined and divided into the following age-dependent groups: 20- 29 years old, 30-39 years old, 40-49 years old, 50-59 years old, 60-69 years old, 70-79 years old, 80-89 years old.

Research methods: The mineral density and mineral content of bone was determined using dual X-ray densitometry by means of „Prodigy” apparatus (GE Medical systems, Lunar, model 8743, 2005).

Research results: The analysis of variation did not expose any reliable influence of age on the BMD and BMC indexes of lumbar

spine.

Bone mineral density was significantly higher in the group of 80-89 year-olds in comparison with other groups that may indicate some "selectivity" of this group. Hip BMD in the group of 70-79 year-olds was significantly lower in comparison with other groups: 20-29 year-olds ($p = 0,012$), 40-49 year-olds ($p = 0,036$), 60-69 year-olds ($p = 0,039$).

Correlation of lumbar spine BMD with height was established ($r = 0,16$; $p = 0,021$), weight ($r = 0,27$; $p < 0,0001$), BMI ($r = 0,22$; $p = 0,001$), BMD hip ($r = 0,62$; $p < 0,001$); BMD hip with age ($r = -0,15$; $p = 0,024$), height ($r = 0,30$; $p < 0,0001$), weight ($r = 0,35$; $p < 0,0001$), BMI ($r = 0,23$; $p < 0,001$).

The osteoporosis of lumbar spine was observed by X-ray densitometry in 4,3% of patients in group of 40-49 years, in 7,9% – group of 50-59 years, in 7,5% – group of 60-69 years, in 19,2% – group of 70-79 years, in 9,1% – group of 80-89 years; hip osteoporosis in 2,3%, 5,3%, 2,8%, 7,6% of patients respectively. Osteopaenia of lumbar spine was established in 34,8% of patients in group of 20-29 years, in 36% – 30-39 years, in 31,9% – 40-59 years, in 28,9% – 50-59 years, in 20% – 60-69 years, in 23,1% – 70-79 years, in 13,6% – 80-89 years; hip osteopaenia in 20,0% of patients, in 12,5%, in 15,9%, in 23,7%, in 19,4%, in 26,9% and in 22,7% respectively. Among patients of 80-89 years normal state of bone was observed in 77,3%.

Conclusions: Age in men has a substantial influence on hip BMD: the lowest indexes were observed in group of 70-79 year-olds. The osteoporosis of lumbar spine was observed in 19,2%, hip osteoporosis in 7,6% of patients in this group.

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HYPODYNAMIA IN ADOLESCENCE AND OSTEOPOROSIS RISK

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Active motion in childhood and adolescence is that very

important factor for building up and maturing of the bone-skeletal system. With view to realization of the so called "strategic" (in childhood and adolescence) osteoporosis prevention, the study aimed to establish the level of physical activity in adolescents, hypodynamia signs and other unfavorable phenomena as risk factors for disturbed bone health. The studied group consisted of 773 adolescents, 14 – 18 years of age, from secondary schools. The study used anthropometric, questionnaire and psychological methods. A number of shortcomings are found in the system of physical exercises in the Bulgarian school. The students whose physical activities are restricted to school sports lessons form a large group at risk with marked signs of hypodynamia (50.98%). The processes of growth, maturing and development of the bone and muscle system in this group are disturbed. The physical development and physical capacity are at a statistically significant lower level ($p < 0.001$), the age annual dynamics of anthropometric indicators is uneven, the peak growth of the bone skeleton is retarded with a year, the rate of kyphoses and kyphoskolioses is higher. The immobilized students, as a result of hypodynamia, form an unfavorable psychosocial pattern – decreased "internal control" and "self-control" with resulting behavior risky for bone health – addiction to harmful habits and styles – tobacco smoking, drinking alcohol etc. The obtained results show that adolescent girls are at greater bone health risk than boys ($p < 0.01$). The fact that physical development indicators in all studied adolescents groups, with high or low physical activity extent, are significantly lower than those of their mates 15 years ago (Slanchev P. et al, 1992) is alarming and suggests retarded and weaker development of the bone-skeletal system. All adolescents in the conditions of polluted environment with reduced oxygen content in resting conditions use maximally the capacity of their lungs (very large range of the anthropometric parameter – $p < 0.001$) which significantly restricts the functional capacity of the respiratory system to work adequately at intensive physical efforts necessary for

stimulation and maintenance of osteogenesis processes. Hypodynamia together with accompanying negative disturbances in the period of growth, maturing and development of the bone-skeletal system create particularly unfavorable life "start" and potential risk for osteoporosis development.