Materials of Conferences

QUANTITATIVE ASSESSMENT OF NUCLEAR ABNORMALITIES IN BUCCAL CELLS OF ROSTOV-ON-DON RESIDENTS

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Micronuclear test is one of the most short-term and practical methods in cytogenetics. The correlation detected between the results of the micronuclear test and chromosomal aberrations analysis allows us to consider the relative amount of nuclear violations as the objective bioindicator of environmental influences. Thanks to the micronuclear test the mutagenic activity test of a large number of chemical, physical and biological agents was conducted (Kozhura and others, 2005; Butorina, 2007; Pavlov and others, 2007; Sycheva, 2012; Zemlyanova, Shcherbina, 2013; Byahova and others., 2014; Khakhulina, Kurchatova, 2014;), and in recent years micronuclear test is used as a non-invasive rapid method of human genome stability assessment (Kalaev and others, 2008, 2010, 2012; Korsakov and others, 2012; Meyer and others, 2014;). The purpose of this study was to determine the background values of the cytogenetic homeostasis indices of large modern city residents with the help of the micronuclear test. We examined different age groups of residents of Rostov-on-don: 80 school children of 11–12 years (group 1), 35 students of 18 to 23 years (group 2) and 52 adults 30–55 years (group 3). All surveyed had nuclear abnormalities in exfoliating cells of the buccal epithelium. Among nuclear defects the most frequent was the intussusception, ambiguous nucleus, microkernel, not so frequent were nucleus strangulation and caudate nucleus. The relative amount of nuclear abnormalities (%) varied in the first group from 2 to 18, on average 6,86 ± 0.44, in the second group it varied from 3 to 26, on average 8,17 ± 0,86. In the third group – from 2 to 28, on average 8.26 ± 0,91. Significant differences in the values of the specified index, depending on age and gender were not found. The comparison of the obtained results with other authors data (Zhuleva and others, 1996; Butorin and others, 2000; Korsakov and others, 2012) showed that the background values of the cytogenetic indices of large industrial cities residents are close enough. The fact is that among the modern inhabitants of large industrial centre the number of genetically defective cells is significantly greater than that one among the residents of Vietnam villages as relatively clean ones (1,98 %) and processed by phytotoxic pollutants in the 60-ies of the 20th century (3,79 %) (Zhuleva and others, 1996). In our opinion, this can once again indicate the extremely unfavorable ecological situation in large cities, which not only threaten the current health of the population, but also violates the genetic homeostasis.

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THE ASSESSMENT OF FUNCTIONAL CAPABILITIES OF YOUNG SWIMMERS AND GYMNASTS

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An important aspect of sports promotion is the activation of physical education of children of preschool and school institutions with the obligatory assessment of their functional capabilities. The aim of this work was to evaluate the effectiveness of young athletes' trainings according to the indicators of the functional status of their body systems and the development of their physical qualities. 123 girls of different ages took part in the study. One group did either gymnastics from 1 to 3 years or swimming for 2 years in addition to their basic physical trainings in preschool or school. Another group of girls had their physical trainings in preschool or school only. The assessment of the impact of physical culture and additional sports activities was carried out by the indices of height and weight, cardiointervals and physical qualities.

The analysis has revealed:

• the harmonious physical development of almost all the girls (of preschool and school) who were involved in gymnastics trainings. The disharmonious development of girls who were and were not involved in sports, can be probably explained by the peculiarities of the training process, which does not correspond the age capabilities of the organism, or by the metabolic syndrome (in case of body weight excess), or by the level of activities which is below the threshold quantity (in the group of therapeutic gymnastics – 1 time per week for 60 minutes);

• the best physical state according to the physical qualities indicators in the groups of gymnastics trainings. In the "swimmers" group the weak point was the forming of strength qualities;

• the tachycardia of a significant number of all girls (the best results had the group of girls training in rhythmic gymnastics, the worst ones had the first-year schoolgirls). This can be probably explained by the school factors – adaptation to a new lifestyle, studying activities, and the gap between the physical activities and the functional capabilities of the child's body.

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