

STUDY OF REACTIONS OF HUMAN SOMATIC CELLS TO THE EFFECT OF ADVERSE FOCAL POINTS OF EXTERNAL ENVIRONMENT

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The level of anthropogenic load on the environment and living organisms, including humans, continues to increase. Therefore, methods that allow to estimate the degree of disorders in the body arising from adverse factors of the environment do not lose their relevance. One of them is a micronuclear test, which is used to examine all age categories of people, because it is non-invasive, and cell reactions can be used as biomarkers of medium exposure to humans.

Micro-nuclei in cells often appear as a result of mutagenic effects on organisms. The presence of micro-nuclei in cells can be considered a universal indicator of contamination, with the help of which it will be possible to quickly and accurately determine the clusogenicity of new synthesized compounds, substances necessary in the home, industry, agriculture, medicine. This will improve environmental monitoring and control of various diseases related to changes in gene structure.

The purpose of the work is to detect changes in somatic cells in response to the damaging effect of environmental factors.

The work was based on relationships between the presence of micronodes in buccal epithelycoites and anthropogenic factors, such as the influence of alcohol, stress, oral rinsing, metal structures in the mouth, the effect of living in contaminated areas on the micronuclear of buccal epithelium cells, the adoption of drugs on the number of cells with micronodes.

Samples of the buccal epithelium were collected from 38 students who underwent questionnaires for harmful habits and other factors.

The frequency of micro-cores was directly dependent on alcohol. Based on the data of the group of subjects, 28 (73,6 %) people take alcohol, 13 (46,4 %) of them regularly take alcohol, they (46,4 %) have elevated levels of micronuclei in cells. According to the results of the study, the frequency of micro-cores depends on the amount of alcohol drunk.

A number of studies have now been conducted to prove the influence of the nervous system on the human hereditary apparatus, including the induction of genetic instability. Analysis of the link between the indicators of genome instability and the expression of emotional stress showed that 28 people (73,6 %) were exposed to stress situations during the last month and the level of micro-nuclei had been elevated. Among these, 13 (46,4 %) of the students had the highest level of micro-cores.

The effect of mouth rinser use. Based on the data, 18 students were found to use different mouthwashes (47,3 %), resulting in a moderately high number of micro-nuclei, with 12 (66,6 %) of them having higher levels of micro-nuclei in the cells, affected by the daily use of rinses.

Thus, basing on a survey done among students, 20 (52,6 %) students do not use mouth rinses. But 11 (55 %) of them have moderately high micronodes in cells. This could also be influenced by other stress-related factors, drug intake, etc.

In the course of the research, the number of micro-nuclei in cells in students who wear braces and plates was revealed, in comparison with students who have no metal structures in their mouth.

Thus from the table we see that, 9 (23,6 %) students have a high number of micro-nuclei, 5 (55,5 %) of them have a large number of micro-nuclei in cells.

Studies were carried out in different pollution levels in cities in Belarus. In the areas of residence where the factories are located, production workshops where the exhaust of various chemicals is higher than in normal areas, more micro-cores have been found. Based on the data, we have found that 6 (15,7 %) students live in contaminated areas, near harmful production such as potassium salt mining, heavy production, etc., and 4 (66,6 %) students have an increased number of micro-nuclei in buccal epithelium cells.

The effect of some chemical preparations on the number of cellular disorders has been investigated. We can draw the following conclusions, 17 (44,7 %) students have moderately high numbers of micro-nuclei due to taking various drugs such as hormonal, painkillers, pressure drugs.

In 12 (70,5 %) of them, the number of micro-nuclei in the buccal epithelium cell is increased.

In summary, it has been found that in response to the damaging effect of medium factors, there is an increase in the number of micro-nuclei in somatic cells.

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EVALUATION OF QUALITATIVE AND QUANTITATIVE APPROACH OF PCR METHOD IN EARLY DETECTION OF HPV

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PCR is characterized by the possibility of qualitative and quantitative analysis. The work was based on the results of a survey of 100 women who applied to the medical center "Invitro" in Minsk with suspicion of HPV. HPV genotypes 16 and 18 are the most common, defined in 70 % of squamous cervical cancer cases and approximately 90 % by adenocarcinoma.

Keywords: human papilloma virus, method of polymerase chain reaction.

HPV is the cause of a number of conditions, in both women and men, including precancerous lesions that can progress to become cancerous. In the laboratory diagnosis of HPV, DNA methods are used. PCR "in real time" is characterized by the possibility of qualitative and quantitative analysis.

The work was based on the results of a survey of 100 women who applied to the medical center "Invitro" in Minsk with suspicion of HPV. The materials for the study were scrapes of the epithelium of the endocervical canal, scrapes of the epithelium from the surface of the cervix. Two reagent mixtures were used: HPV 1 and HPV 2. PCR was used for diagnosis. Testing was carried out to detect HPV infection with subsequent serotyping of the found variants, as well as determination of the concentration of HPV DNA.

1. DNA detection of HPV-54 women was carried out using a test system that identifies 11 genotypes of high carcinogenic risk (16, 18, 31, 33, 35, 39, 45, 51, 52, 58, 59, 67), with a separate definition of HPV 16 type DNA working on the principle of PCR Amplicens HPV WRC;

2. DNA detection of HPV-26 women was carried out using a test system that identifies two main phylogenetic groups-A7, A9, which include the following 10 types: 16, 18, 31, 33, 35, 39, 45, 52, 58, 59 + HPV DNA of 51 (group A5) and 56 (group A6) types, and also allows to calculate DNA concentrations of these phylogenetic groups in the studied material;

3. Detection of HPV – 20 DNA of women was carried out using a test system that will allow them to differentiate and determine the concentration of the most oncogenic type 16 and 18 viruses in clinical material to determine the likelihood of cervical dysplasia.

After receiving the results of the study, all women were divided into two groups: HPV – positive and HPV-negative. A qualitative version of PCR allowed to identify 54 women who applied: 20 (37 %) – women detected human papilloma virus; 34 (63 %) – not infected. Of the women who were diagnosed with the virus, 25 % had HPV 16; 25 % had HPV 31, 35, 39, 59 and 50 % had HPV 18, 33, 45, 52, 58, 67. Quantitative variant of PCR in determining human papilloma virus of high carcinogenic risk 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59 the analysis revealed 26 women who applied: 16 (62 %) women were found to have human papillomavirus; 10 (38 %) women were not infected. Of 26 women, 20 % have lg copies of 3 to 5/100000 cells, i.e. is clinically significant-there is a risk of dysplasia; 80 % of women have >5 lg copies/100000 cells, i.e. a high probability of dysplasia.

The quantitative variant of PCR in determining the human papilloma virus of high carcinogenic risk 16, 18, type allowed to identify 20 women who applied: 4 (20 %) women were found human papilloma viruses; 16 (80 %) women were not infected. Of the women who were diagnosed with the virus, 100 % had HPV 16 and 0 % had HPV 18. Moreover, in 50 % of women the number of lg copies < 3/100000 cells, which is clinically insignificant; in 50 % of women from 3 to 5 lg copies/100000 cells, i.e. is clinically significant-there is a risk of dysplasia.