CYTOGENETIC AND IMMUNOLOGIC TECHNOLOGIES FOR RADIATION DOSE ASSESSMENT

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Cytogenetic dosimetry is recognized as a valuable dose assessment method which fills a gap in dosimetric technology, particularly when there are difficulties in interpreting the data. In cases where there is reason to believe that persons not wearing dosimeters have been exposed to radiation, in cases of claims for compensation for radiation injures that are not supported by unequivocal dosimetric evidence, or in cases of exposure over an individual's working lifetime.

Two decades has gone after the Chernobyl disaster, but it still remains in the human memory. Chernobyl nuclear accident represents the most catastrophic nuclear accident in the history, characteristic not only by a large number of emergency workers but an important part of population affected in nearby regions. Radioactive substances derived from Chernobyl nuclear accident also affected extensive areas in Europe, inclusively the Republic of Moldova with subsequent contamination of the environment.

The aim of our study was to establish the cytogenetic and immunological affects in participants of diminution of Chernobyl nuclear accident consequence's (PDCNAC) offspring.

Using multilateral approach, our study confirms scientifically, both installed immunologic pathologies and cytogenetic complication in the offspring populations. Special attention was granted to immune status evaluation – key subject in organism's immune reactivity. Personally obtained data were analyzed in view of contemporary existing scientific information from other sources.

According to the presented results we can conclude that in offspring's cells persisted genomic mutations and chromosomal aberrations. So, the average frequency of polyploidy and hyperploids cells of offspring was increased respectively by 2.8 and 3.0 times, compared with that of patients in the control group.

Immunological analysis included a multilateral study: immunophenotyping of peripheral blood lymphocytes in two steps, using determinants CD AcMon: CD19, CD3, CD4, CD8, CD16, CDHLA DR and FITC.

To estimate the results in the determination of the immune status the index of the tension of the immune response (IT) was used, characterized by analyzing of the correlation of the amount of T-CD4+ (T-lymphocyte helper) and T-CD8 + (T-lymphocytes suppressor) to T-CD3 + (pan T-lymphocytes) x 100, investigated by imunofluoriscent immunophenotyping (monochromatic colouring) or the correlation of T-CD4+ and TCD8+ to TCD3+, investigate by the biphenotypic method.

Our results indicated an unfavourable immunological situation of examined group, with a likeness of their immune disorder type with the state immunity of parents exposed to ionizing radiation with a high level of insufficient coexpresation of differentiation antigens.

Variance analysis of lymphocyte populations detected an increase in the given index, specially for the CD3+, CD4+ and CD5+, with the exception of CD10+ populations.

Conclusion. Cytogenetic and immunological study of PDCNAC's offspring elucidated their genome instability and immune status disorder. The increased intensity of chromosomal mutagenesis in somatic cells of this group indicates to attribute this group to the population with major risk.