

CYTOGENETIC EFFECTS IN PERIPHERAL BLOOD LYMPHOCYTES IN DESCENDANTS OF CHERNOBYL DISASTER LIQUIDATORS UNDER THE IMPACT OF MITOMYCIN C IN VITRO AND FOLIC ACID IN VIVO

Starchenko I. I., Kovaleva V. I., Kryghna S. I.

National University of Pharmacy, Kharkiv, Ukraine

klinlab@nuph.edu.ua

Introduction. The evaluation of the genetic consequences of the Chernobyl disaster still remains extremely urgent and is of keen interest for the scientific community all over the world. One of the most important problems is genome instability transferred by irradiated sex cells of fathers to the first generation of their descendants. The genetic consequences of exposure to radiation not only lead to serious disturbances in the development of descendants, but also to an increased risk of cancer, genome instability, and deterioration in the viability of phenotypically normal descendants from irradiated fathers.

Aim. All the abovementioned determined the purpose of our study, which is an examination of spontaneous and induced mutagenesis, as well as the influence of FA on the resistance of the chromosomal apparatus in children whose fathers participated in liquidating the consequences of the Chernobyl disaster.

Materials and methods Chromosome specimens obtained from a culture of peripheral blood lymphocytes (PBL) have been used as material for cytogenetic analysis. Mitomycin C at a final concentration of 3 µg/mL was added to the culture 67 h after the start of incubation in order to evaluate the influence of the mutagen on the stability of the chromosomal apparatus in children. Colchicine at a final concentration of 7.5 µg/mL was added to the culture of cells 3 h before fixation. Metaphases (80 to 100) of each child were analyzed without test influence and with additional treatment of the cultures with the mutagen in vitro.

Results and discussion When comparing the reaction of the chromosome apparatus of peripheral blood lymphocytes to the testing mutagenic in vitro influence after taking FA, a decrease in the total level of chromosomal aberrations from 23.95 to 5.36% ($p < 0.001$) and certain types of chromosomal aberrations was revealed. According to the references in, presence of damage in the enzymic repair system can appear as high sensitivity of the genetic apparatus to various mutagens, including bleomycin. An increased level of sensitivity of lymphocyte chromosomes to mutagenic treatment in vitro is now regarded as a predisposition to oncopathology development

Conclusion The obtained data have confirmed the possibility to increase the genetic resistance of children, born to liquidator families, by the use of FA.