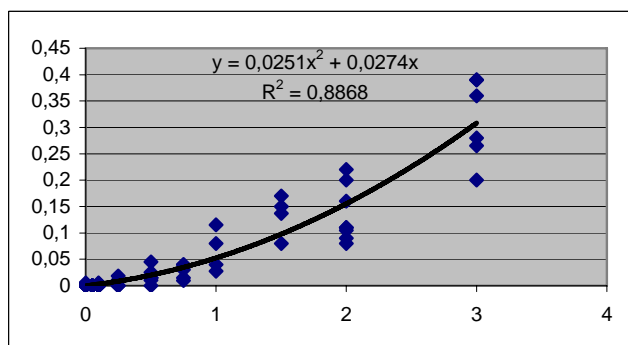


BIOLOGICAL DOSIMETRY IN RADIATION ACCIDENTS. DOSE-RESPONSE CURVES BY DICENTRICS ANALYSIS AND MICRONUCLEUS TEST

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Radiation workers and general population as well may suffer radiation overexposure. The frequencies of dicentrics and micronuclei in human peripheral blood lymphocytes are the most frequently used biomarkers for biological dose estimation. Dose-effect curves after in vitro ^{137}Cs gamma- irradiation are established for these two main bioindicators of radiation exposure. Peripheral blood samples of 7 different donors were used. The blood irradiation was performed with ^{137}Cs , gamma-rays, at dose-rate 0,87 Gy/min., using different doses: 0.0, 0.05, 0.1; 0.25, 0.5, 0.75, 1.0, 1.5, 2.0, and 3.0 Gy.

Linear-quadratic dose response relationship was established based on dicentric and ring chromosomes yield. The relationship can be described by the following equation: $Y = 0.0274D + 0.0251D^2$, where (Y) = dicentric and ring chromosomes yield, (D) = radiation dose obtained.



In vitro ^{137}Cs radiation exposure showed a linear-quadratic relationship for the yield of micronucleated cells as well. Dose-effect curve established for the yield of cells with micronuclei can be described by the following equation: $Y = 0.06D + 0.01D^2$, where (Y) = micronucleated cells yield, (D) = radiation dose obtained.

Some of the recent radiation incidence occurred in Bulgaria and the carried out biodosimetry are presented in the present report. The calibration curves were applied for biological estimation of the absorbed dose whole body exposure of subjects suspected for accidental radiation exposure from ^{137}Cs , ^{192}Ir , and ^{60}Co radiation sources.

EXCEL software was used for calculating the received dose by using these equations, as a whole body equivalent dose acute irradiation. In all cases the estimated dose was low and below the range of acute radiation effects. Therefore no special medical treatment was required. In such low ranges the dose is estimated with large variability.