

**Genotoxic and late effect of treatment on somatic cells**C. Bilban-Jakopin<sup>a</sup> and M. Bilban<sup>b</sup><sup>a</sup>*Institute of Oncology, Repnje 50, 1217 Vodice, Slovenia;* <sup>b</sup>*Institute of Occupational Safety, Repnje 50, 1217 Vodice, Slovenia**cjakopin@onko-i.si*

Background: The aim of the study was to find persistent chromosomal aberrations in somatic cells cancer patients after different therapies.

Patients and methods: This prospective study includes 90 patients aged 17 to 35. With respect to histological results and prescribed therapies they were divided into five groups. Group I was treated with surgery, Group II with a combination of surgery and radiotherapy, Group III with surgery and monochemotherapy, Group IV with polichemotherapy only and Group V with chemotherapy and irradiation. The changes in the genome of individual cells after therapy were detected by the structural chromosomal aberrations (SCA) test performed at diagnosis, immediately after treatment completion and once a year in the following ten years. SCA was categorized as chromosomal breaks, acentric fragments, dicentrics and ring chromosomes. Gaps were not included in the total number of SCA. Statistical differences in the genome between groups were determined by the Kruskal-Wallis test.

Results: Prior to treatment the genomes of the patients did not differ from those of the control group. Immediately after completion of treatment strong inhibition of the mitotic activity of lymphocytes and a significant increase in the percentage of structural chromosomal changes ( $p < 0.005$ ) were found in Groups II, III, IV and V. The percentage of SCA was higher after polichemotherapy than after monochemotherapy, but lower than after irradiation ( $p < 0.017$ ). One year after completion of treatment mitotic activity was found to be mainly normal, but a large percentage of chromosomal aberrations persisted ( $p < 0.05$ ). The number of cytogenetic changes was lower, but still considerably higher than before treatment. We resolved that the period of one year is too short to allow genome normalization. From the cyto-mutagenic point of view, the irradiation had stronger effect on the genome than the treatment with cytostatics. Three years later percentage of chromosomal aberrations were lower, but persisted in Groups I, IV and V. Ten years after therapy the cytogenetic tests were within the normal range of laboratory values for the healthy population.

Conclusion: These statistically significant values established for SCA may be associated with the predominance of the cells afflicted with different types of genome changes. After irradiation as well as after chemotherapy the genome was repaired, but needed many years and the heavily damaged cells, if viable, may be at higher risk of neoplastic transformation, due to the changes in the expression of oncogenes or tumour suppressor genes.