CHROMOSOMAL RADIOSENSITIVITY OF LYMPHOCYTES OF PROSTATE CANCER PATIENTS AND HEALTHY DONORS ANALYSED BY FISH

Schmitz, Sabine (1), Brzozowska, Kinga (1), Pinkawa, Michael (2), Eble, Michael (2), Kriehuber, Ralf (1)

(1) Department of Safety and Radiation Protection, Forschungszentrum Jülich GmbH, D-52425 Jülich, Germany
(2) Department of Radiotherapy, University Hospital, RWTH Aachen, D-52074 Aachen, Germany

Background: It is known that about 10 % of cancer patients show severe clinical side effects during and after radiotherapy due to enhanced sensitivity to ionizing radiation. Identification of those radiosensitive individuals by an *in vitro* assay before onset of treatment would be of great impact for successful radiotherapy.

In this study we compared the radiosensitivity of the chromosomes 2, 11 and 17 in prostate cancer patients with and without severe side effects after radiotherapy and in age-matched healthy donors (control cohort). The chromosomal radiosensitivity of peripheral blood lymphocytes (PBL) of radiotherapy patients was used as predictive parameter for clinical side effects.

Material und Methods: Each cohort consisted of at least 10 donors. PBL were irradiated ex vivo with 0.5, 1 und 2 Gy (Cs-137 γ-rays) in the G0-Phase of the cell cycle. We analyzed the radiosensitivity of the chromosomes 2, 11 and 17 by scoring of 100 FISH painted metaphases for each dose point. Statistical analyses were performed by non-parametric Mann-Whitney test, by test of variances (ANOVA) and Chi-square goodness-of-fit test at a significance level of 0.05.

Results: Analysis of the overall aberration yield revealed no significant differences between any donor groups. However, variance analyses showed significant differences between the patient's cohort and healthy donors for chromosomes 11 and 17 for all doses analyzed. In contrast, this was not true for chromosome 2. Furthermore, good correlations between chromosomes sizes (DNA content) and aberration yield were found.

Conclusion: The cohort of prostate cancer patients can be distinguished from healthy donors due to variances of the aberration yields of the chromosomes 11 and 17. These chromosomes might be potential cytogenetic biomarkers for prostate cancer patients in clinical studies.

Funded by Dr. Erich-Schmitt-Foundation

Kontakt: Schmitz, Sabine
Telefon: 02461/61-3638
e-mail: sa.schmitz@fz-juelich.de