

Conclusion: PR-350 is as efficient as but less toxic than etanidazole. Clinical studies of this compound, especially in combination with intraoperative radiotherapy or radiosurgery, seem to be warranted.

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POSTER

Oxygen tension in metastatic lymph nodes and the changes during acute respiratoric hypoxia

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Purpose: The radiosensitivity of tissues is influenced by acute and chronic hypoxia. Based on the oxygen effect a new therapeutic modality has been developed to protect healthy tissues while hypoxic breathing during irradiation the hypoxyradiotherapy.

Patients and Methods: The effect of hypoxic breathing (8.1% O₂) on the pO₂ in metastatic lymphnodes was studied in 14 patients. Tissue oxygenation was assessed using a polarographic electrode system.

Results: The median pO₂ was 19.6 mm Hg prior to hypoxic breathing with a great intra- and intertumoral variability. The relative frequency of pO₂-values <5 mm Hg was between 0 to 88%. During breathing of hypoxic gas mixture we registered no significant changes in the mean, the median or in the pO₂-values <5 mm Hg.

Conclusions: In metastatic lymphnodes can be found chronic hypoxia with great inter- and intratumoral pO₂-variability. The hypoxic breathing (8.1% O₂) shows no significant changes in the tumor oxygenation. This fact explains the experimental and clinical experience, that the hypoxic breathing (8–10% O₂) protects the healthy tissue without changes in the radiosensitivity of chronic hypoxic tumor tissue.

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POSTER

Radiation therapy choroidal neovascularization in age-related macular degeneration

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Purpose: A prospective Phase I/II study was designed to determine the toxicity and efficacy of external beam radiation therapy in patients with age-related macular degeneration (ARMD) complicated with choroidal neovascular membranes (CNVM).

Methods: Patients older than 55 years with progressive vision loss who had been treated with laser or who were assessed as not suitable for laser treatment were included in the trial. Submacular degeneration was detected using FFA. Patients with diabetic or hypertensive retinopathy were excluded. Patients who refused the radiation treatment were included in the control group. Biomicroscopy and FFA were performed and visual acuity was determined just before the commencement of radiation therapy. A single lateral 6 MV photon beam portal with a field size of 3 × 4 cm was used. It was angled 50 posteriorly to avoid the anterior segment of the contralateral eye. Using asymmetric collimation, isocenter was placed just posterior to the lens of the involved eye. Computerised planning was done for all patients. Dose was normalised to the posterior segment of the involved eye. Total radiation dose was 15 Gy with 3 Gy per fraction in 5 elapsed days for the first part of the study and 20 Gy with 4 Gy per fraction in 5 days for the second part. Subretinal neovascularization and size of scar field were determined with FFA 1., 3., 6., 12. and 18. months after radiation therapy. Orbital CT with high resolution was taken.

Results: To date 34 patients were included in the study and 3 in the control group. Mean age was 71 with a range of 55 and 86 (23 male; 11 female). Duration of symptoms ranged between 1 and 45 months with a mean of 7 months. Subjective improvement or stabilisation have been achieved in the great majority of the patients. No acute or subacute side-effect has been observed. Detailed analysis with respect to patient and radiation therapy factors will be presented.

Conclusion: External beam radiation therapy appears to be effective in achieving improvement or stabilisation for the patients with ARMD complicated with CNVM without any acute or subacute side-effect.

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POSTER

Extended salivary response to ionizing irradiation: An experimental study

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Purpose: previous studies have examined the acute effects of head and neck radiation (IR) in rats, but none have reported salivary function at later time points post IR.

Methods: in this study, mature male Wistar rats were given a single exposure of 0, 2.5, 5, 7.5, 10, or 15 Gy head and neck X-irradiation. Animals were provided with food and water ad libitum. Body weight, parotid (P) and submandibular (SM) gland weights, and P and SM salivary flow rates were determined at 6, 9, and 12 months following irradiation.

Results: At 6 months there were dose-related reductions in gland weight which were significant at 7.5 Gy and above for P and 5 Gy and higher for SM. Significant reductions in salivary flow were found only in the 15 Gy groups for both P and SM glands. A similar picture was seen at 9 months. Of greatest interest were results at 1 year following irradiation. There was late mortality, between 9 and 12 months, with death of all 15 Gy rats. Body weight of animals in the 7.5 and 10Gy groups was significantly decreased. At 12 months, P gland weight was significantly less at all radiation doses examined (2.5, 5, 7.5, and 10 Gy) compared to controls. P salivary flow also was significantly decreased in every dose group.

Conclusion: these data demonstrate that 1) there are significant late effects of head and neck X-irradiation on the salivary glands and survival in rats; 2) at 12 months, P weight and function are more significantly affected by X-irradiation than SM glands; and 3) a single dose of head and neck X-irradiation as low as 2.5 Gy can significantly affect P function and result in the death of rats between 9 and 12 months post-exposure.

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POSTER

Radiosensitizing effects of cisplatin and carboplatin in prostate cancer cell lines

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Purpose: The radiosensitizing effect of cisplatin has been described in various tumors. In prostate cancer however, this concept has not yet been validated in clinical nor in experimental settings.

Methods: Cisplatin was added to cultures of human (DU-145) and rat (R3327 MATLy-Lu) prostate cancer cell lines, maintained in RPMI 1640 medium supplemented with 10% fetal calf serum. The final concentrations were 0.33, 1.67 and 3.30 µM for cisplatin and 0.167, 0.33 and 1.67 µM for carboplatin. Immediately after plating and addition of the drug irradiation was given to doses of 2, 4, 6 and 8 Gy. The surviving fraction was determined by counting cell numbers after 3 days. In addition, a semi-solid agar assay was performed and the number of colonies was determined after 7 days.

Results: At various combinations of cisplatin and radiotherapy, a supra-additive effect was observed in both assays. Similar effects were observed with carboplatin. The addition of glutathione (1 g/l) was shown to protect against radiation effects. Co-incubation with cisplatin and glutathione resulted in inactivation of the biological effect of cisplatin, presumably by precipitation. Pretreatment of cultures with glutathione did not influence the pattern of supra-additivity, as observed without glutathione.

Conclusion: A supra-additive effect was observed for various combinations of platinum compounds and irradiation. The present results suggest that glutathione is not a major factor in the radiosensitizing effects of cisplatin and carboplatin.

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POSTER

5-Fluorouracil abolishes cell cycle arrest and increases cytotoxicity by different mechanisms when added after cisplatin or X-irradiation

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Introduction: DNA-damaging agents, such as cisplatin (CDDP) and X-irradiation, inhibit cell cycle progression from G2 to mitosis. When the G2 arrest is abrogated the toxicity of DNA damage is increased. For mitosis the cdc2p34 enzyme has to be active. The balance between the phosphorylat-