Table 1: Measurements in mm

	Bodyfix			Vaclok		
	Median	Min	Max	Median	Min	Max
COM AP	8.2	4.1	10.8	7.9	5.1	16.1
COM SI	4.5	2.1	9.1	4.4	2.1	9.9
Base AP	8.9	4.8	13.8	9.0	6.0	18.1
Base SI	3.8	2.6	7.8	4.9	2.9	8.8
Post AP	7.9	3.0	11.1	8.1	4.8	19.7
Post SI	4.9	2.1	11.7	5.8	2.7	11.1
Apex AP	9.4	1.8	13.5	8.2	6.3	13.5
Apex SI	3.6	2.0	10.8	4.5	1.8	9.6

1364 ORAL

Predicting the radiotherapy service requirements in Scotland in 2015

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Background: Provision of adequate radiotherapy machine capacity is crucial to ensuring optimal cancer care. Therefore, as part of a National Planning process the Scottish Executive commissioned this work to establish the potential requirements over the next decade.
Methods: Firstly, using age-period-cohort regression models the predicted number of cases for the different cancer types that will be diagnosed in 2011–2015 was calculated. Then, using adaptations of models developed by the Australian National Cancer Control Initiative [1], data from a variety of Scottish audits were used to calculate the optimal Scottish radiotherapy utililisation. Finally, all site-specialist Radiation Oncologists in Scotland were surveyed as to their current standard fractionation for each radiotherapy indication and predicted changes in fractionation by 2011–2015.
Results: There is a predicted 18.9% increase in the number of cancer cases (specifically breast +23.4%, lung −9.6%, prostate+35.0%, colorectal+29.0%, head & neck+24.9%). The optimal radiotherapy utilisation for all cancer sites during the initial management phase was 44.2–47.9% but varied from 4% to 78.6% (head & neck 78.6%, breast 70.0%, lung 62.8%, prostate 61.4%) and 5.0 to 5.3% should receive radiotherapy at relapse. Based on current patient numbers and recommended fractionation between 198,000–243,000 fractions are required currently to deliver optimal treatment. With the increase in cancer incidence and predicted changes in fractionation between 242,452–318,422 fractions will be required by 2011–2015. However, to prevent waiting lists demand should represent 90% of capacity, therefore the capacity to deliver between 270,000 and 354,000 fractions per annum will be required.
Conclusions: By 2006 in Scotland, if current machine working practices continue there will be capacity to deliver 234,000 fractions per annum. Therefore over the next decade there needs to be a further significant increase in the numbers of fractions of radiotherapy available, for optimal cancer treatment. Further work is ongoing on how best to meet this demand.

References

[1] http://www.ncci.org.au/pdf/radiotherapyreport.pdf

Poster presentations (Mon, 31 Oct)
Radiotherapy and radiobiology

1365 POSTER

Modulation of tumor cell radiosensitivity by native immune cells: the role of interferon-ã in iNOS mediated radiosensitization

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Background: Hypoxia and the pro-inflammatory tumor infiltrate are two factors of the tumor microenvironment, which underlie tumorigenesis and generally correlate with poor prognosis. It is well known that hypoxia directly impairs the radiosensitivity of tumor cells, while the impact of immune cells remains unclear. In this study, we examined the radiomodulatory effects of native immune cells on hypoxic tumor cells. We hypothesized that activated immune cells may secrete interferon-γ (IFN-γ), which may induce the production of the radiosensitizer NO inside tumor cells through the iNOS pathway. To activate immune cells, clinically relevant concentrations of lipid A and IL-12+IL-18 were used.
Material and methods: Native immune cells were isolated from the spleen of Balb-c mice and were activated for 24h with lipid A (3 μg/ml) or with IL-12 (3 ng/ml) + IL-18 (30 ng/ml) to produce conditioned medium (CM). The CM was analyzed for IFN-γ production by ELISA and diluted 10 times with fresh medium to apply on EMT-6 mammary carcinoma cells. All treatments were performed in 1% oxygen, modeling the hypoxic tumor microenvironment. The induction of nitric oxide synthase (iNOS) in the tumor cells was analysed by RT-PCR, Western blotting and nitrite accumulation. The tumor cells were irradiated in a model of metabolic hypoxia and cell survival was measured by a colony formation assay.
Results: Activated spleen cells secreted a high level of IFN-ã, up to 1750 pg/ml/24h. The induction of IFN-ã was confirmed at the transcriptional level by RT-PCR, using an ABI PRISM 7000 sequence detection system and predeveloped assays on demand. The CM from activated spleen cells induced iNOS in EMT-6 tumor cells, resulting in the accumulation of the oxidative NO metabolite nitrite, up to 36 μM/24h. The induction and resulting enzymatic activity of iNOS were abrogated by more than 50% by a neutralizing IFN-γ antibody. The induction of iNOS resulted in a significant hypoxic tumor cell radiosensitization, with an enhancement ratio of 2.2. This radiosensitization was abrogated by the metabolic iNOS inhibitor aminoguanidine and inhibited by more than 50% by a neutralizing IFN-γ antibody.
Conclusions: Activated spleen cells radiosensitize hypoxic tumor cells through the production of IFN-γ, which induces the production of the radiosensitizer NO inside tumor cells. Therefore, the pro-inflammatory tumor infiltrate represents a novel target for radiosensitizing strategies.

1366 POSTER

A double-blind, randomised, placebo-controlled clinical study to evaluate a topical hyaluronic acid-based, hydrolipidic treatment for radiation dermatitis

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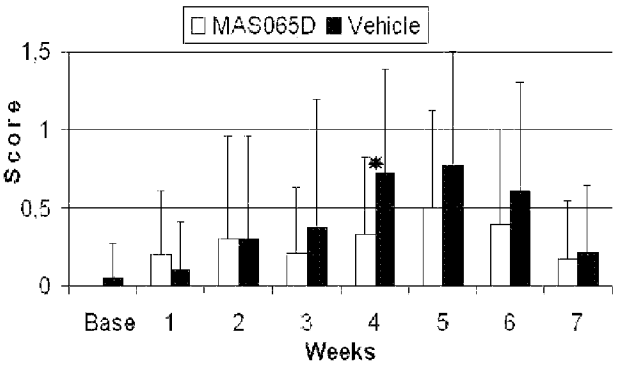
Background: Radiation damage associated with radiotherapy reduces quality of life for patients, particularly where there is moist desquamation (up to 10% of patients [1]. There are no widely available commercial preparations with clinically proven benefit in the management of radiation dermatitis. This study was designed to assess the efficacy and tolerability of a new preparation, MAS065D, in the management of radiation dermatitis in patients receiving radiotherapy for breast cancer.
Methods and materials: MAS065D (Xclair™, Sinclair Pharmaceuticals Ltd) is a hydrolipidic topical preparation designed to reduce the skin reactions that follow radiotherapy by increasing hydration and dampening down the cascade of damage arising from free radicals and enzymes released within irradiated skin, thereby helping to preserve skin integrity. The vehicle control had only emollient properties, and did not contain hyaluronic acid or other key ingredients.



NCI Grading

Twenty patients were randomised blindly to use the two study preparations, three times daily, on separate sections of the irradiated skin, throughout the duration of radiotherapy and for two weeks afterwards. Patients were monitored before therapy, weekly during therapy, and for two weeks after radiotherapy was completed. Skin appearance according to NCI toxicity