Table 1 CDR-CAS-IMAT and IMRT in target volume, and organ at risk volume dosimetric parameters comparison（x±s）

	Ptv d98	ptvv95	ptvv100	PTV CI	PTV min	PTV HI	CordV40(%)
CDR-CAS-IMAT	5993.7±100.2	99.3±0.25	97.8±1.1	0.75±0.02	5264.5±182.3	0.17±0.03	1.4±0.2
IMRT	5529.4±165.5	97.4±0.46	94.9±0.4	0.79±0.05	4813.0±254.8	0.25±0.05	0.4±0.4
T Value	7.315	12.423	4.737	-2.655	3.432	-11.667	5.295
P Value	.005	.001	.018	.077	.041	.001	.013

Comments：PTV D98 is 98% planning target volume accepted dose；PTV V95 is 95% planning target dose accepted irradiated volume；the other the same as.

Table2 Volumes in the healthy tissues receiving comparison（x±s）

	E-P V5(%)	E-P V10(%)	E-P V15(%)	E-P V20(%)	E-P V30(%)
CDR-CAS-IMAT	15.4±2.2	10.4±2.0	7.7±1.9	5.8±1.7	3.6±1.2
IMRT	11.7±2.2	6.4±1.8	4.5±1.5	3.4±1.1	2.3±0.7
T Value	6.110	7.304	7.068	6.031	5.042
P Value	.009	.005	.006	.009	.015

Comments: E-P is CT scan body volume subtraction the volume of PTV

Table 3 CDR-CAS-IMAT and IMRT comparison in MU，delivery time and delivery accuracy of DTA and γ pass rate（x±s）

	γ（±3mm、±3%）	DTA（±3mm、±3%）	Treatment time (s)	MU
CDR-CAS-IMAT	91.5±1.1	94.8±2.4	69.5± 9.5	611.8± 139.3
IMRT	94.9±3.4	94.5±1.3	223.8± 35.9	321 ± 46
T Value	-2.8	.43	-8.6	5.1
P Value	.070	.699	.003	.015

Comments：DTA :Distance to Agreement

Conclusion

Conventional Varian 23EX Linac CDR-CAS-IMAT Plans for glottic carcinoma can be implemented smoothly and quickly into a large, busy cancer center. CDR-CAS-IMAT planning can meet the clinical demand, gives comparable OAR and improved PTV CI, give a reduction in treatment time but increased the MU and low dose irradiated area. An evaluation of weight loss must be performed during treatment for CDR-CAS-IMAT patients, and should be selected according to the actual situation of the patient treatment.

PO-089 Melatonin enhances the toxicity of radio- and chemotherapy in head and neck cancer cells

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Purpose or Objective

After reported a melatonin's gel that protects normal cells from oral mucositis induced by radio- or chemotherapy, we wondered about how melatonin affects tumoral cells. It is well known that both radio- and chemotherapy act at different intracellular levels such as nucleus, membranes and mitochondria. On the other hand, mitochondrion is the main melatonin target. So we evaluated here whether melatonin can synergize with radio- or cisplatin- therapies to enhance the cytotoxic effects of these treatments.

Material and Methods

The dose-dependent effects of melatonin were analyzed in irradiated or cisplatin-treated Cal-27 and SCC-9 tongue cell lines. Cells were maintained in DMEM medium, supplemented with 10% fetal bovine serum at 37 °C in a humidified atmosphere of 5% CO2 and 95% air. Cells were treated with melatonin (100 μM, 500 μM , and 1500 μM) alone or in combination with 8 Gy irradiation or 10 μM CDDP. The clonogenicity capacity of the cells, proliferative potential (MTT), apoptosis, cell cycle, mitochondrial mass, mitochondrial respiration, ROS production, nitrites and GSH/GSSG levels, as well as antioxidant enzymes activity and western blot, were assessed. We also studied the potential synergistic effects of melatonin with the different treatments in vivo. Moreover, we induced tumour xenografts in nude mice using Cal-27 cells. Mice with tumour were treated with radio-or chemotherapy. Hematoxylin/Eosin staining, immunohistochemical analyses such as Ki-67 (proliferation) and TUNEL assay (apoptosis) were performed to evaluate the tumoral progress.

Results

The in vitro results showed a rise in the treatment toxicity in a melatonin dose-dependent manner, potentiating the cytotoxic effects of the radio- and the chemotherapy. Melatonin also acts inhibiting the tumor growth in vivo.

Conclusion

High melatonin concentrations enhance the cytotoxicity of radiotherapy and the chemotherapeutics in head and neck human cancer.

Ortiz F, et al. J Pineal Res 2015; 58: 34-49

Escames G, et al. Hum Genetics 2012; 131:161-173

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PO-090 Oncostatic effect of melatonin in head and neck cancer: role of mitochondrial function

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Purpose or Objective

Cancer cells have some special features that give them the ability to change and to resist different types of treatments. These changes are produced by modifications in the mitochondrial bioenergetics, that is, a switch in the metabolism. These advantages consist in the so-called Warburg effect. Cancer cells depend on glycolysis instead of oxidative phosphorylation to get the energy necessary to proliferate and to survive. Thus, a treatment against this mechanism would control cancer spread. In normal cells melatonin boosts the mitochondrial function and scavenges oxygen radicals, protects them from oxidative damage and increasing cell's survival. As mitochondrion is a therapeutic target in cancer cells, we wanted to know how melatonin affects the mitochondria of these cells.

Material and Methods

The effects of high concentrations of melatonin (100 μM, 500 μM, and 1500 μM) were evaluated in Cal-27 cell lines. Cells were cultured in DMEM supplemented with 10% fetal bovine serum at 37 °C in a humidified atmosphere. Cells were treated with melatonin for 1, 3 and 5 days. The following parameters were analyzed: proliferation, mitochondrial mass, mtDNA content, mitochondrial respiratory capacity, glycolytic capacity (Seahorse), ROS production, activity of antioxidant enzymes, glutathione levels, and metabolomic study. Moreover, the *in vivo* oncostatic effect of melatonin was assessed in mice with Cal-27 xenografts. Tumour-carrying mice were treated with 300 mg/kg melatonin for 21 days when immunohistochemical, TUNEL assay and MRI studies were performed. Toxicity study of melatonin was performed using C57BL/6J with a chronic treatment of oral melatonin at high concentration for 3 and 6 months measuring biochemical and histological markers.

Results

The results showed that melatonin induced a switch to aerobic mitochondrial metabolism in cancer cells that increased ROS production, reducing cell proliferation. Melatonin also showed an oncostatic effect *in vivo*, with a reduction in the tumor cell proliferation, and increasing the apoptotic rate, with histological changes compaytble with these changes. Concerning toxicity studies, melatonin did not show any side effects in healthy mice.

Conclusion

Mitochondrial changes induced by melatonin lead to a metabolic switch in cancer cells inducing cellular dead but doesn't affect normal tissues.
Ortiz F, et al. J Pineal Res 2015; 58: 34-49
Escames G, et al. Hum Genetics 2012; 131:161-173
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PO-091 Intensity modulated radiotherapy (IMRT) in nasopharyngeal cancer – a dosimetric and QoL analysis

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Purpose or Objective
Intensity modulated radiation therapy (IMRT) as a treatment technique has become the standard of care in treatment of nasopharyngeal carcinoma. The dosimetry of the modality with respect to parotid and other normal organ sparing and other clinical outcomes are presented in our study.
Material and Methods
The medical records of 32 patients with histologically proven primary nasopharygeal carcinoma treated with IMRT were retrospectively reviewed. The majority of patients showed advanced clinical staging. IMRT was performed in step-and-shoot technique using an integrated boost concept. The boost volume covered the primary tumor and involved nodes with doses of 66–70.4 Gy (single dose 2.2 Gy) and uninvolved regional nodal areas were covered with doses of 54–59.4 Gy (median single dose 1.8 Gy). The dose constratints were optimized and normal organs at risk (OARs) spared. Dosimetric analysis was done and quality of life was assessed at initial stage and later during follow up at 3 and 6 months. The survival analysis was evaluated.
Results
The median follow-up for the entire cohort was 24 months. Radiation therapy was completed without interruption in all patients. Four local recurrences have been observed, transferring into 1-, 3-, and 5-year Local Control (LC) rates of 95%, 90% and 90%. Two patients developed regional nodal recurrence, resulting in 1-, 3-, and 5-year Regional Control (RC) rates of 95%. All locoregional failures were located inside the radiation fields. Distant metastases were found in three patients, transferring into 1-, 3, and 5-year Distant Control (DC) rates of 90%, 84% and 82%. Progression free survival (PFS) rates after 1, 3 and 5 years were 85%, 72% and 65% and 1-, 3- and 5-year Overall Survival (OS) rates were 90%, 85% and 80%. Acute and chronic toxicities were assessed as per EORTC grading scale and found to be better with IMRT and under acceptable tolerance levels.
Conclusion
IMRT with an integrated boost concept yielded good disease control, good OARs sparing, better quality of life outcomes and overall survival in patients suffering from primary nasopharyngeal cancer with acceptable acute side effects and limited rates of late toxicity.

PO-092 Dosimetric comparaison of conformal and intensity modulated radiotherapy for locally recurrent NPC

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Purpose or Objective
Locally recurent nasopharyngeal carcinoma (NPC) can be salvaged by reirradiation with a substantial degree of radiation related complications.
The aim of this study was to evaluate the dosimetric advantage of intensity modulated radiotherapy (IMRT) in treating locally recurrent NPC.
Material and Methods
Between January 2014 and september 2016, six patients with no metastatic locally recurrent NPC were re-irradiated with concomitant chemotherapy. The median prescrepted dose was 60 Gy with 2 Gy per fraction. Treatment planning of each patient was performed for tow techniques : Three dimentional Conformal radiotherapy (3D CRT) and Intensity modulated radiotherapy (IMRT). The minimum dose (Dmin), the maximuim dose (Dmax) and the volume that received 95% of the dose prescrepted (D95%) of the planning target volume (PTV) and doses to the organs at risk (Spinal cord and brainstem) were calculated and compared for the tow techniques.
Results
All two techniques delivered adequate doses to the PTV. The average Dmin was 48Gy for the two techniques, the average Dmax was 67,5 Gy vs 64,2 Gy respectively for IMRT and 3D CRT (p=0,41) and D95% was 96%. Concerning the organs at risk, the Dmax for the brainstem was significantly higher for 3D CRT (22 Gy vs 14 Gy, p= 0,003). This finding were similar for the spinal cord (20Gy vs 7,8 Gy). But, the difference was not statically significant (p=0,12).
Conclusion
Based on the dosimetric comparaison, IMRT was optimal by delivering a conformal and homogenous dose to the PTV with significant better sparing of critical organs than 3D CRT.
In this regard, re-irradiation using IMRT may be a very attractive technique for locally recurrent NPC.

PO-093 COSTAR trial results: 3-D Conformal Radiotherapy vs Cochlea-Sparing IMRT in parotid cancer patients

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Purpose or Objective