

Conclusion: This method of acquiring functional imaging is feasible and provides biological information to complement the anatomical and morphological characteristics of target volumes. It may be possible using these functional parameters to identify at an early time-point those who are not responding to treatment and may therefore benefit from an escalated radiotherapy dose to improve outcomes.

Table 1. Summary statistics for all patients CT, T1wMRI, FDG-PET (mean volumes), DCE and DW MRI scans before and after induction chemotherapy for head and neck cancer.

Baseline						Post induction chemotherapy					
FDG-PET											
CT (cm ³)		MRI (cm ³)		PET (cm ³)		CT (cm ³)		MRI (cm ³)		PET (cm ³)	
1°	LN	1°	LN	1°	LN	1°	LN	1°	LN	1°	LN
22.50	9.62	21.96	8.56	10.89	4.08	4.66	3.38	4.99	3.18	0.18	0.32
DCE MRI											
Ktrans (mean) = 0.268		IAUGC60 (mean) = 20.8				Ktrans (mean) = 0.181*		IAUGC60 (mean) = 12.4*			
DW MRI											
ADC (mean) × 10 ⁻³ mm ² /s = 0.89						ADC (mean) × 10 ⁻³ mm ² /s = 1.07*					

Ktrans: Transfer constant, IAUGC60: Initial (60s) area under the gadolinium curve, ADC: Apparent diffusion coefficient, *P < 0.01 for comparison of parameter in scan 1 vs scan 2.

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POSTER

Induction TPF Chemotherapy Followed by Concomitant RT, Cetuximab and Cisplatin for Inoperable HN-SCC (Phase II Study EMR-62202-717)

C. Grasic Kuhar¹, B. Zakotnik¹, B. Zumer², K. Karner², B. Jancar², P. Strojanc². ¹Institute of Oncology Ljubljana, Medical Oncology, Ljubljana, Slovenia; ²Institute of Oncology Ljubljana, Radiation Oncology, Ljubljana, Slovenia

Background: To test the efficacy and toxicity of induction TPF chemotherapy followed by concomitant RT with cetuximab (CMb) and cisplatin (CP) in locally and/or regionally inoperable HN-SCC in a single-institution, one-arm phase II study.

Materials and Methods: 4 cycles induction TPF (docetaxel 75 mg/m², CP 75 mg/m², 5-FU 750 mg/m² 96h infusion Q3W); RT (70 Gy, 7 wks, 2 Gy/day); CMb (400 mg/m² 1 wk before RT; 250 mg/m²/wk during RT) and CP (30 mg/m²/wk during RT). Efficacy was assessed by CT/MRI after the 4th cycle of TPF and 14–16 wks after RT/CMb/CP. Toxicity was assessed according to NCI and RTOG toxicity criteria.

Results: Between 3/2008 and 11/2009, 30 pts (25 male, 5 female), 42–70 yrs old (median 55), entered the study. Sites of origin were: oropharynx 18, hypopharynx 6, oral cavity 5 and larynx 1. All tumours were TNM stage IV (T4 80%; N2b-3 67%).

Five pts received <3 TPF cycles due to: progressive disease (3), G4 diarrhea (1) and G5 febrile neutropenia with sepsis(1). Twentyfive (83%) pts received 4 cycles of TPF over 62–69 days (median 63). Of these, 16% had G3/4 infusion related reaction to CMb and received RT with CP only; 72% received ≥ 6 CMb and 52% ≥ 6 CP applications. RT dose of 70 Gy was delivered in all pts over 46–57 (median 48) days. Overall treatment time was 135–154 (median 141) days. Weight loss during therapy was 2–17% (median 8); radiomucositis and dermatitis ≥ 3 were in 96 and 64% of pts, respectively. Radiologically, locoregional complete response (CR) rate after TPF in 30 pts was 30% (local 47%, regional 35%). At 14–16 wks after RT/CMb/CP 13/25 (52%) pts had CR (locally 80%, regionally 62%). Two pts had salvage neck surgery. Median follow-up time was 24 mos (range 13–33). The locoregional control, disease-free and overall survival rates at 24 mos were: 51% (95% CI, 32–70%), 42% (24–60%), and 52% (34–70%), respectively. According to skin reaction to CMb ($G \leq 1$: 9 pts vs. $G \geq 2$: 12 pts): locoregional control was 33 vs. 80%, $p = 0.01$; disease-free survival 33 vs. 58%, $p = 0.09$; overall survival 40 vs. 74%, $p = 0.18$.

Conclusions: Considering prognostically an extremely unfavourable profile of pts, the tested regimen seems efficient with manageable toxicity. $G \geq 2$ skin reaction correlates with better efficacy in this trial.

Trial sponsors: Institute of Oncology Ljubljana, Merck Serono

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POSTER

A Phase II Study of Docetaxel, Cisplatin, and Oral S-1 Induction Chemotherapy Followed by Chemoradiotherapy in Advanced Squamous Cell Cancer of the Head and Neck – Preliminary Results: a Trial of the Korean South West Oncology Group

W. Bae¹, K. Kim², Y. Joo³, I. Chung¹, S. Cho¹, K. Lee⁴, E. Song⁵, H. Yun⁶, I. Cho⁷. ¹Chonnam National University Hwasun Hospital, Hematology-Oncology, Hwasun Jeonnam, Korea; ²Chonnam National University Medical School, Pharmacology, Gwangju, Korea; ³Chonnam National University Hwasun Hospital, Gastroenterology, Hwasun Jeonnam, Korea; ⁴Chungbuk National University Hospital, Hematology-Oncology, Cheongju, Korea; ⁵Chonbuk National University Hospital, Hematology-Oncology, Chonbuk, Korea; ⁶Chungnam National University Hospital, Hematology-Oncology, Daejeon, Korea; ⁷Eulji University Hospital, Hematology-Oncology, Daejeon, Korea

Background: Induction chemotherapy with TPF is a standard regimen for patients with locally advanced head and neck squamous cell carcinoma (SCCHN). The purpose of this study was to evaluate the tolerability and efficacy of induction chemotherapy with docetaxel, cisplatin and oral S-1 followed by concurrent chemoradiotherapy (CCRT) for advanced SCCHN. Primary objectives were response rate and safety as neoadjuvant therapy. **Patients and Methods:** Eligible patients had previously untreated squamous carcinoma of any head and neck site, with stage III-IVb. All patients were treated with 3 courses of induction chemotherapy. Induction comprised docetaxel 30 mg/m² days 1 and 8, cisplatin 60 mg/m² day 1, and oral S-1 70 mg/m² days 1–14, repeated every 21 days. After induction chemotherapy, cisplatin was given at a dose of 100 mg/m² every 3 weeks with radiotherapy.

Results: From October 2008 to September 2010, 35 patients were enrolled. 30 patients (85.7%) completed induction chemotherapy. Response to the induction chemotherapy was as follows: 9 patients (25.7%) achieved a complete response (CR) and 21 patients (60.0%) a partial response (PR). Grade 3/4 toxicity during induction therapy included neutropenia (14.4%), neutropenic fever (2.2%), nausea/vomiting (2.2%), mucositis (2.2%) and diarrhea (4.4%). After CCRT treatment completion, complete and partial responses were recorded in 54.3% and 31.4% of the patients respectively. With a median follow up of 17 months (range 1 to 32), two years overall survival rate was 69.4%.

Conclusions: Docetaxel, cisplatin and oral S-1 induction chemotherapy showed a high level of objective response, mainly PR and moderate treatment-induced toxicity. Induction chemotherapy with an oral S-1 plus docetaxel and cisplatin is convenient, tolerable, and effective, and it is a promising option for patients with good PS.

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POSTER

Sequential Chemoradiotherapy Treatment Compliance Between the Elderly and Younger Patients With Head and Neck Squamous Cell Carcinoma

S.W. Loo¹, K. Geropantas¹, Z. Tasigiannopoulos¹, I. Worthington¹, W.M.C. Martin¹, T.W. Roques¹. ¹Norfolk and Norwich University Hospital, Oncology, Norwich, United Kingdom

Background: The proportion of patients with head and neck squamous cell carcinoma (HNSCC) who are elderly (defined as 65 years and above) is increasing. The aging process is associated with a variety of physiological changes that may affect a patient's ability to tolerate aggressive treatments such as sequential chemoradiotherapy (SCRT). In our institution, treatment decisions for patients with HNSCC are based on tumour stage, disease characteristics, performance status and co-morbidity score, not chronological age. As a result, the elderly comprise one-third of all patients commencing SCRT. The aim of this study is to compare SCRT treatment compliance between the elderly and younger patients with HNSCC.

Materials and Methods: SCRT treatment protocol consists of 3 cycles of induction chemotherapy (IC) with cisplatin and 5-fluorouracil followed by radical radiotherapy (RT) with concomitant weekly carboplatin (CC). Patients with histologically confirmed HNSCC who commenced SCRT between October 2003 and June 2010 were identified from our database and included in the study.

Results: 194 patients were identified, 148 males and 46 females. 66 patients were elderly, of whom two died from induction chemotherapy. Data on treatment compliance are shown in the table.

Conclusions: Treatment compliance of SCRT in elderly patients is comparable to that of the younger cohort. There is no statistically significant difference in the parameters studied except unplanned hospitalisation during RT. Chronological age alone does not appear to impair patients' tolerance to SCRT in HNSCC.

	Younger	Elderly	p-value
Number of patients in the study	128 (66%)	66 (34%)	
Did not receive all planned cycles of IC	21.1%	21.2%	1.00
IC dose reduction	26.6%	34.8%	0.180
Unplanned hospitalisation during IC	5.5%	12.1%	0.153
Proceeded to radical RT following IC	99.2%	97.0%	0.267
Completed radical RT with no prolongation of treatment duration by more than 2 days	95.3%	89%	0.442
Unplanned hospitalisation during RT	7.1%	20.3%	0.014
Did not commence planned CC	10.3%	20%	0.172

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POSTER

Induction Chemotherapy Followed by Concomitant Chemo-Radiation in Locally Advanced Nasopharyngeal Carcinoma – a Single Institution Experience

N. Alsafadi¹, F. Alqadah², S. Alghamdi¹, M. Garni³, K. Qureshi², Z. Alzibair², H. Mugati³, T. Muhaimeed³, T. Darwish⁴, I. Maniyar⁵.

¹King Abdullah International Medical Research Center, Princess Norah Oncology Center, Radiation Oncology, Jeddah, Saudi Arabia; ²King Abdullah International Medical Research Center, Princess Norah Oncology Center, Medical Oncology, Jeddah, Saudi Arabia; ³King Abdullah International Medical Research Center, Princess Norah Oncology Center, Head & Neck Surgery, Jeddah, Saudi Arabia; ⁴King Abdulaziz Hospital & Oncology Center, Medical Oncology, Jeddah, Saudi Arabia; ⁵King Abdulaziz University Hospital, Medical Oncology, Jeddah, Saudi Arabia

Background: Nasopharyngeal Carcinoma (NPC) is the commonest Head & Neck cancer in Saudi Arabia. Concomitant Chemo-radiotherapy (CRT) with cisplatin followed by 3 cycles of adjuvant Cisplatin based chemotherapy is the standard of care in patients with locally advanced disease (LANPC). However, the compliance with adjuvant chemotherapy has been unsatisfactory.

Material and Methods: Between August 2002 and July 2010, fifty-four patients (37 males: 17 females) with locally advanced (AJCC Stage III & IV), non-metastatic NPC were treated using Induction Chemotherapy (IC) with Docetaxel, Cisplatin, and 5-FU (TPF) for 3 cycles, followed by Concomitant chemo-radiation using weekly Carboplatin with conventionally fractionated 3-D conformal radiotherapy to a total dose of 65–70 Gy.

Results: Median age was 42 years (15 to 72). Twenty-six patients (48%) had stage IV disease, and 17 (31%) had T4 tumours. Undifferentiated Carcinoma Nasopharyngeal Type accounted for 96% of the cases. Forty-six patients had more than 12 months follow-up (median 42) and are the subject of the following analysis. Two patients died during induction chemotherapy. Of the remaining 44 patients, IC resulted in 25% Complete Clinical Remission, and 72% Partial Remission, an overall Response Rate of 97%. Hematological toxicity was frequent, but manageable. In total, there were 2 local and 2 distant relapses, 2 of them appearing beyond 3-years of follow-up. Two patients died of progressive disease, one is alive with disease, and one local relapse was successfully salvaged with further radiotherapy. For the entire series (46 patients) the 4-year Kaplan–Meier Overall Survival (OS) rate is 88%. For the 44 patients who completed the protocol, the 4-year Disease Free Survival (DFS) rate is 84%. All 8 patients under 23 year of age remain disease-free at more than 6 years median follow-up. One patient developed a suspected grade 3 neurologic toxicity, and another had a cerebral-vascular accident one year following salvage local re-irradiation.

Conclusions: Sequential therapy as used in this group of patients seems well tolerated and yields high remission rate and an encouraging DFS and OS in patients with LANPC. Future development should focus on better risk stratification, and systematic use of Intensity Modulated Radiation Therapy-like techniques. Young adults with LANPC may need a different treatment approach that would include IC followed by response-adjusted chemo-radiotherapy.

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POSTER

Influence of Performance Status, Hemoglobin Level, Body Mass Index and Presence of Feeding Tube on Treatment Outcomes and Toxicities in Locally Advanced Head and Neck Cancer Patients Treated With Induction Chemotherapy and Chemoradiation

G. Castro Jr¹, C.H. Anjos¹, R.E. Martins¹, A.L. Okita¹, R. Gadia², A. Borges³, E. Gil², A. Del Giglio⁴, P.M. Hoff¹. ¹Instituto do Cancer do Estado de Sao Paulo, Clinical Oncology, Sao Paulo, Brazil; ²Instituto do Cancer do Estado de Sao Paulo, Radiation Therapy, Sao Paulo, Brazil; ³Hospital das Clinicas da FMUSP, InRad – Radiation Therapy, Sao Paulo, Brazil; ⁴ABC Foundation School of Medicine, Oncology, Santo Andre, Brazil

Background: Induction chemotherapy followed by chemoradiation (IC-CRT) is a treatment option of LAHNC, but it is associated with significant

toxicities. We studied the impact of performance status (PS), hemoglobin level (HB), body mass index (BMI) and the presence of feeding tube (FT+) on overall survival (OS) and toxicity in LAHNC patients (pts) treated with IC-CRT.

Materials and Methods: It is a retrospective study on 100 pts consecutively treated in 2 institutions with CDDP 75 mg/m² in combination with paclitaxel 175 mg/m², every 21 d, as induction chemotherapy (IC), followed by concurrent chemoradiation (CRT): 70 Gy (2 Gy/d, 35 fractions, 5 times/week) and CDDP 100 mg/m² d1, d22 and d43. Pre-treatment ECOG-PS, HB, BMI and FT+ were analyzed as predictors of IC- and/or CRT-related toxicities as categorical variables. OS was estimated by the Kaplan–Meier method and curves were compared with log-rank. A multivariable Cox proportional hazards model was used to control for prognostic factors.

Results: 94 pts were staged as T3–4 and 70 pts as N2–3. Oropharynx (50 pts) and larynx (30 pts) were the most frequent primary sites, and 71 pts had ECOG-PS 0–1. The median number of IC cycles was 3 (1–6) and the response rate to IC was 81%. 79 out of 94 pts completed CRT (14 pts were under treatment and one pt died). The median delivered RT dose in primary tumour was 70 Gy in 61 d, and the median number of concurrent CDDP cycles during RT was 2. There was no association between PS, HB, BMI and FT+, and IC-related G3+ toxicities, and during CRT, ECOG-PS 0–1 pts presented significantly higher rate of G3+ toxicities (p = 0.040). The median OS was 17.7 months. In a mean follow-up of 12 months, 31 pts were alive and disease-free. Estimated 2-year OS was significantly better for pts with ECOG-PS 0–1 vs. 2–3 (50% vs. 0%, HR 0.35, p = 0.002), HB > 12 vs. <12 g/dL (55% vs. 12%, HR 0.39, p = 0.007), BMI > 22 vs. <22 kg/m² (70% vs. 27%, HR 0.21, p = 0.005) and no FT vs. FT+ (48% vs. 9%, HR 0.38, p = 0.005). BMI > 22 kg/m² and no FT at the beginning of IC remained significant as favorable prognostic factors in terms of OS in a multivariate analysis.

Conclusions: Our results suggest that LAHNC pts presenting with good PS, high HB levels, high BMI and no FT present better OS rates when treated with IC-CRT, and if confirmed in other studies, these prognostic factors must be taken into account in treatment selection.

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POSTER

Moderately Accelerated Radiotherapy Using Intensity Modulated Radiotherapy With Induction and Synchronous Chemotherapy in Treatment of Nasopharyngeal Carcinoma – Early Toxicity and Dosimetry

D. Thomson¹, G. Webster², K. Mais¹, L.W. Lee¹, A.J. Sykes¹, N.J. Slevin¹, B.K. Yap¹. ¹The Christie NHS Foundation Trust, Clinical Oncology, Manchester, United Kingdom; ²The Christie NHS Foundation Trust, Medical Physics, Manchester, United Kingdom

Background: Treatment for stage III–IV non-nasopharyngeal head and neck cancer includes induction chemotherapy with docetaxel, cisplatin, 5FU (TPF), radiotherapy and synchronous cisplatin. Induction chemotherapy is recommended for locally advanced nasopharyngeal carcinoma (NPC) and those with bulky nodal disease to treat micro-metastatic spread and reduce tumour volume to allow radiation dose escalation using intensity modulated radiotherapy (IMRT). IMRT also permits coverage of parapharyngeal space disease. We report acute toxicity and dosimetry data in patients with NPC treated with moderately accelerated radiotherapy using IMRT plus induction and synchronous chemotherapy.

Material and Methods: 10 patients, median age 51 years (range, 27–74) with stage IIb–IVc NPC (7/10 bilateral cervical nodal disease) received 3–4 cycles induction chemotherapy (TPF n=8; PF n=2), IMRT and up to 2 cycles synchronous cisplatin. CTV1 included primary and nodal disease with a 5 mm and 10 mm margin, respectively; CTV2 and CTV3 areas at intermediate or low risk of microscopic disease. Each CTV was expanded 3 mm to form PTV. Prescribed doses to mean PTV1, PTV2 and PTV3 were 70 Gy, 63 Gy and 56 Gy, respectively, in 33 fractions. Planning organ at risk volumes (PRV) were defined for spinal cord and brain stem with 5 mm margin; optic nerve and optic chiasm with 3 mm margin. Superficial and deep lobes of parotid were delineated. Inverse planning was performed and dose-volume histograms of target volumes and normal structures evaluated. Acute toxicity was assessed by RTOG scoring criteria.

Results: All patients completed induction chemotherapy and radiotherapy; 6/10 completed 2 courses synchronous chemotherapy. One patient received 4 cycles TPF and 1 planned cycle of synchronous cisplatin. 8/10 developed grade 3 mucositis and 7/10 required enteral tube feeding. There was no grade 4 toxicity. Doses to 99% and 95% of mean PTV1 were 65.0±1.0 Gy and 67.3±0.4 Gy, respectively. Doses to 1 cc of critical structures' PRV were within target dose limits in all patients. Mean dose to contralateral cochlea was 50.3±9.0 Gy, exceeding target dose of 50 Gy in 7/10 patients; and to contralateral parotid 41.1±7.2 Gy, exceeding target dose of 26 Gy in all patients.

Conclusions: Treatment of NPC with induction TPF, moderately accelerated radiotherapy and synchronous cisplatin is feasible, although 3/10