locoregionally advanced tumors. Platinum-based chemoradiotherapy is a widely adopted treatment for patients with unresectable locoregionally advanced HNSCC, those ineligible for surgery and those refusing surgery due to potential sequelae. While this approach has yielded favorable results in developed countries, its effectiveness in real-world settings in developing countries remains underexplored. Investigating treatment outcomes in this context is essential for optimizing oncologic care. **Objectives:** To assess the toxicity profile, tumor response, event-free survival (EFS), and overall survival (OS) in patients with locoregionally advanced HNSCC treated with definitive platinum-based chemoradiotherapy. **Materials and Methods:** This retrospective study included 233 patients treated at the Oncology Service of the General Hospital of University of Campinas (UNICAMP). Inclusion criteria encompassed patients aged 18 or older, with an Eastern Cooperative Oncology Group (ECOG) of 2 or lower, who underwent radiotherapy (RT) combined with either weekly or every-three-weeks administration of cisplatin (CDDP) or carboplatin (Carbo) as definitive treatment. Grade 3 or 4 adverse events were documented according to the National Cancer Institute, Common Terminology Criteria for Adverse Events (NCI CTCAE v5.0) standards. Response Evaluation Criteria in Solid Tumors (RECIST) criteria. Survival outcomes were estimated with the Kaplan-Meier method, and statistical comparisons were performed using the log-rank test and Cox proportional hazards regression for univariate and multivariate analyses. **Results:** The median age of patients enrolled in study was 60 years. Most enrolled subjects were males, active or former smokers and drinkers, had good performance status and comorbidities, and presented moderately differentiated and advanced tumors. Tumors were equally distributed in oral cavity, pharynx and larynx. Half of the patients developed grade 3 or 4 toxicities, with nausea/vomiting and nephrotoxicity being more frequently observed in the RT + CDDP group, while anemia and neutropenia were predominant in the RT + Carbo group. A total of 75% of patients achieved either complete or partial tumor response, with no significant impact from the treatment regimen. The two-year EFS and OS rates were 43.3% and 66.0%, respectively. Poor prognosis was associated with active smoking, ECOG performance status ≥ 2, stage IV disease, and treatment with RT + Carbo. Patients with these characteristics had an approximately twofold higher risk of presenting relapse and disease progression leading to death. **Conclusion:** This study highlights RT and CDDP as the most effective definitive treatment for patients with locoregionally advanced HNSCC from a Brazilian public hospital. Nevertheless, further prospective and randomized phase III study conducted with those patients is essential to define the optimal treatment strategy for these patients Acknowledgements: The study was supported by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).

Keywords: Definitive therapy, Head and neck squamous cell carcinoma, Outcome.

https://doi.org/10.1016/j.htct.2025.103782

BIODISTRIBUTION OF A TECHNETIUM-99M RADIOLABELED PEPTIDE DERIVED FROM LAMININ-111 IN A BREAST CANCER MODEL

Fernanda Ferreira Mendonça [a], Marycel Figols de Barboza [b], Solange Amorim Nogueira [b], Ana Claudia Camargo Miranda [b], Jorge Mejia [b], Leonardo Lima Fuscaldi [a], Luciana Malavolta [a]

[a] *Department of Physiological Sciences, Faculdade de Ciências Médicas da Santa Casa de São Paulo, São Paulo, SP, Brazil*
[b] *Hospital Israelita Albert Einstein, São Paulo, SP, Brazil*

A B S T R A C T

Introduction/Justification: Breast cancer is a significant public health concern, ranking as the second most common tumor type among women. According to the World Health Organization (WHO), more than 14 million people develop breast cancer annually, with this number projected to rise to over 21 million by 2030. Studies have shown that biologically active peptides derived from laminin-111 can regulate gene expression in breast cancer-derived cells, among which the YIGSR peptide is of particular interest. Peptides designed to inhibit intracellular signaling pathways fall within the realm of molecular targeted therapies, which commonly focus on receptors overexpressed in tumors. **Objectives:** This study aimed to evaluate the biological behavior of the HYIGSR peptide, a laminin-111 derivative, radiolabeled with technetium-99m ([99mTc]Tc(CO)3), in a biodistribution assay using both control and breast cancer model mice. **Materials and Methods:** The HYIGSR peptide was radiolabeled using the tricarbonyl method, which enabled labeling at the histidine residue with the organometallic aqua-ion [99mTc(H2O)3(CO)3]+, abbreviated as [99mTc]Tc(CO)3. The reaction was carried out by reducing [99mTc]TcO4- under 1 atm of CO for 30 min at 70° C, followed by incubation with approximately 148 MBq of [99mTc]Tc(CO)3 for 30 min at 85°C. The radiochemical purity of [99mTc]Tc(CO)3-HYIGSR was assessed using TLC-SG strips with 0.9% NaCl as the eluent. A breast cancer animal model was established by inoculating female Balb/c nude mice with 1×10^7 MDA-MB-231 breast cancer cells. After 30 days, in vivo (molecular imaging) and ex vivo biodistribution studies were performed. The radiolabeled peptide was intravenously administered to both healthy and tumor-bearing female Balb/c nude mice, and ex vivo biodistribution analysis was conducted at 1 and 3 h post-injection. Molecular imaging of healthy mice was acquired via planar scintigraphy using a single-hole collimator on a Discovery VH clinical gamma camera, with an acquisition time of 5 min and a geometric magnification of 9 × . All animal experiments adhered to local ethical guidelines for animal research (Protocol number: CEUA – HIAE 6015-24). **Results:** The radiolabeling process using [99mTc]Tc(CO)3 was successfully standardized, yielding [99mTc]Tc(CO)3-HYIGSR with a radiochemical purity of 95.53 ± 1.19% (n = 5). Ex vivo biodistribution analysis in female Balb/c nude mice (n = 4) demonstrated rapid blood clearance

over time, with increased uptake in the kidneys. Minimal accumulation of the radiolabeled peptide was observed in the heart, spleen, lungs, and muscle, with the percentage of the injected dose per gram (%ID/g) remaining below 5%. However, high uptake was observed in the liver, stomach, intestine, and thyroid. In tumor-bearing mice, tumor uptake was measured at 0.58 ± 0.25 %ID/g, with a tumor-to-muscle ratio of 1.54 ± 0.14. Preliminary molecular imaging in the healthy group confirmed in vivo biodistribution findings consistent with ex vivo data. **Conclusion:** These findings suggest that while the [99mTc]Tc(CO)3-HYIGSR complex demonstrated efficient radiolabeling, further modifications may be necessary to enhance its tumor-targeting capabilities and improve its overall diagnostic potential.

Keywords: Biodistribution, Breast, Laminin-111, Radiolabeled, Technetium-99m.

https://doi.org/10.1016/j.htct.2025.103783

THE ROLE OF PSMA PET/CT IN THE CHARACTERIZATION OF HEAD AND NECK SQUAMOUS CELL CARCINOMA

Hadila da Silva Veras Sousa,
Victor Cabral Costa Ribeiro Heringer,
Ligia Traldi Macedo, Najua Abou Arab,
Simone Kuba, Celso Dario Ramos,
Carmen Silvia Passos Lima

Universidade Estadual de Campinas (UNICAMP), Campinas, SP, Brazil

A B S T R A C T

Introduction/Justification: Head and neck squamous cell carcinoma (HNSCC) is an aggressive malignancy, often diagnosed at advanced stages. The 18-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) reflects glycolytic activity in tissues and has been widely used for staging and monitoring HNSCC. However, its specificity is limited by false positives in inflammatory processes. PET/CT with prostate-specific membrane antigen (PSMA) has been investigated as an alternative to 18F-FDG due to its expression in tumor neovasculature, but its role in HNSCC remains unclear. **Objectives:** To evaluate the uptake patterns of 18F-PSMA-1007 PET/CT in HNSCC, in comparison with 18F-FDG PET/CT, aiming to explore its potential in tumor characterization, staging, and monitoring. **Materials and Methods:** Patients with advanced locoregional HNSCC, either at initial diagnosis or with tumor relapses, were enrolled in the study. Individuals who had undergone surgical tumor resection or received chemotherapy and/or radiotherapy within the last six months were excluded. All enrolled patients underwent 18F-FDG PET/CT and 18F-PSMA-1007 PET/CT imaging, with a 24-hour interval between the exams. The images were analyzed independently by two nuclear medicine physicians and one radiologist. Statistical comparisons between groups were performed using the t-test, with significance set at $P < 0.05$. **Results:** Fourteen patients (nine at initial diagnosis, five with recurrent disease) were analyzed using both PET/CT imaging modalities. The median age was 61 years (range: 49-81), with eleven males and three females. Most patients were current or former smokers and alcohol consumers, had good performance status (ECOG 0), and presented with stage IV tumors. The primary tumors were located in the oropharynx, larynx, and oral cavity, with one sinonasal tumor. Recurrences, were observed in locoregional lymph nodes, lungs, and bones. HNSCC lesions were typically characterized by FDG uptake, although most lesions also exhibited varying degrees of PSMA uptake. In primary tumors and nodal disease, the mean ± SD and median (range) SUV values obtained with FDG PET/CT at 1 hour were 25.6 ± 16.4 and 21.0 (10.7–59.8), and 11.7 ± 7.7 and 8.6 (2.7-26.4), respectively. For PSMA PET/CT, the mean ± SD and median (range) SUV values at 1 hour in primary tumors and nodal disease were 4.5 ± 1.3 and 4.3 (2.9-6.3), and 4.9 ± 2.6 and 3.9 (2.8-10.2), respectively. FDG uptake values were higher than PSMA uptake values in primary tumors ($P < 0.001$) and lymph nodes ($P = 0.01$). **Conclusion:** HNSCC lesions were more effectively detected by FDG PET/CT, highlighting its superior sensitivity for assessing tumor activity. However, PSMA uptake in most tumors suggests the coexistence of glycolytic activity and neoangiogenesis, reinforcing the value of integrating FDG and PSMA PET for tumor characterization, staging, and monitoring. The pronounced PSMA expression in certain cases supports the feasibility of theranostic PSMA-targeted therapies or anti-angiogenic treatments. Further research is needed to elucidate the relationship between PSMA expression, tumor angiogenesis, and HNSCC biology. Acknowledgements: The study was supported by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and Fundação de Apoio ao Ensino e à Pesquisa do Estado de São Paulo (Cancer Theranostics Innovation Center, CancerThera, FAPESP #2021/10265-8).

Keywords: Head and neck squamous cell carcinoma, PET CT PSMA, PETCT FDG.

https://doi.org/10.1016/j.htct.2025.103784

EGFR-TARGETING PEPTIDE INHIBITS HELA CELL PROLIFERATION: A NOVEL STRATEGY FOR CERVICAL CANCER THERAPY?

Reem Hussin, Danielle Vieira Sobral,
Fernanda Ferreira Mendonça,
Leonardo Lima Fuscaldi, Luciana Malavota

Faculdade de Ciências Médicas da Santa Casa de São Paulo, São Paulo, SP, Brazil

A B S T R A C T

Introduction/Justification: Cervical cancer remains one of the leading causes of cancer-related mortality in women worldwide, with EGFR overexpression contributing to uncontrolled proliferation, resistance to apoptosis, and tumor progression. Despite advances in radiotherapy and chemotherapy, many patients develop resistance, highlighting the urgent need for