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.

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

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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.

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

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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

targeted therapies that can disrupt these oncogenic pathways. Peptide-based drugs represent a promising avenue for precision oncology, offering high specificity, low toxicity, and potential to inhibit key molecular drivers of cancer. This study investigates the YHWYGYTPQNVT peptide, designed to interact with EGFR, and evaluates its effect on proliferation and migration of HeLa cells, a widely used model of cervical cancer. **Objectives:** This research aims to determine whether the YHWYGYTPQNVT peptide can effectively suppress EGFR-mediated growth signaling in HeLa cells, by analyzing cell proliferation, metabolic activity, and migration, aiming at establishing its potential as a therapeutic alternative to traditional cancer treatments. **Materials and Methods:** The YHWYGYTPQNVT peptide was synthesized using solid-phase peptide synthesis, purified via HPLC, and confirmed by mass spectrometry. HeLa cells were cultured in DMEM + 10% fetal bovine serum and incubated at 37°C with 5% CO_2. To establish a baseline proliferation rate, HeLa cells were plated at 5×104 cells in 6-well plates, and the growth curve was performed in sextuplicate over a 5-days period, with cell counts conducted on days 1, 3 and 5. For the experimental group, cells were treated with YHWYGYTPQNVT (80 μmol/mL). Statistical analysis was conducted using GraphPad Prism, with significance set at $p \leq 0.05$. **Results:** The YHWYGYTPQNVT peptide was synthesized efficiently with yield of approximately 45%. Chromatographic analyzes obtained by HPLC and mass spectrometry confirmed that the entire synthesis, cleavage, and purification process of peptides were performed efficiently. Control group displayed an aggressive proliferation rate with an exponential growth, reaching $\sim 96.8 \times 10^4$ cells, consistent with the known oncogenic potential of HeLa cells. In contrast, the peptide-treated group showed a significant reduction in proliferation, with final cell counts averaging 61.5×10^4 cells - corresponding to a 25.5% decrease compared to untreated cells. **Conclusion:** Our findings highlight YHWYGYTPQNVT as a promising EGFR-targeting agent capable of reducing cervical cancer cell proliferation. By directly interfering with EGFR-driven oncogenic pathways, this approach could lay the groundwork for a new class of peptide-based therapeutics in oncology. Further in vivo validation and molecular pathway analysis are necessary to determine its potential clinical application in patients with EGFR-overexpressing cervical tumors.

Keywords: Anti-EGFr-peptide, Cell proliferation, Cervical cancer, HeLa cells.

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COMPARISON BETWEEN 18F-PSMA AND 18F-FDG RADIOTRACERS FOR PET/CT IN THE EVALUATION OF PATIENTS WITH METASTATIC MELANOMA

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A B S T R A C T

Introduction/Justification: PET/CT has emerged in the last two decades as a dominant imaging modality used for staging, monitoring response and surveillance of melanoma using 18F-FDG as radiotracer. Recent publications have demonstrated the possibility of use of 18F-PSMA PET/CT as an additional resource to the evaluation of melanoma, due to the expression of Prostate-Specific Membrane Antigen protein (PSMA) in these cancer cells and because anti-PSMA antibodies react with malignant melanoma neo vasculature. **Objectives:** Would 18F-PSMA PET/CT have the potential role of a novel diagnostic imaging technique in melanoma cases? **Materials and Methods:** Eleven participants with diagnoses of metastatic melanoma underwent 18F-FDG PET/CT and 18F-PSMA PET/CT (24-hours interval), and the lesions uptakes were evaluated with both radiotracers. The results were grouped in three categories: A - greater expression of 18F-PSMA compared to 18F-FDG; B – equivalent uptake between the radiotracers; and C - greater expression of 18F-FDG compared to 18F-PSMA. **Results:** 18,1% of participants were in category A, 54,5% in category B and 27,2% in category C. The lesions with greater 18F-PSMA uptake compared to 18F-FDG were mainly in the brain, lungs, adrenals, and scattered throughout the chest. Furthermore, one subjects presented only 18F-PSMA uptake in brain metastasis, showing the importance of this method to the clinical follow-up of these patients. Our findings align with the Chang et al.'s, who demonstrated in vitro expression of PSMA in the neovasculature of melanoma lesion and with Snow et al.'s who observed PSMA positivity in endothelial cells of capillaries within stage III/IV melanoma metastases. **Conclusion:** Therefore, apart from the use of 18F-PSMA PET/CT in staging prostate cancer patients, this method shows a great potential in the evaluating of metastatic melanoma, still needing further and longer studies to confirm these advantages.

Keywords: 18F-FDG PET/CT, 18F-PSMA PET/CT, Melanoma.

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EVALUATION OF THE AFFINITY OF RADIOLABELED PEPTIDE [^{131}I]I-DEDEYFELV FOR EGFR-OVEREXPRESSING RECEPTORS IN ADULT-TYPE DIFFUSE GLIOMAS

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