p = 0.01) expression when compared to cells expressing ERP29. In contrast, the transfection of miR-4421 inhibitor reverted those effects, decreasing the expression of MAPK1 (FC: 0.6, p = 0.03), AKT1 (FC: 0.1, p = 0.02), and JUN (FC: 0.1, p = 0.02) compared to the negative control. In FaDu-R cells, ERP29 silencing increased SOS1 (FC: 2.2, p < 0.01), MAPK1 (FC: 2.1, p < 0.01), and AKT1 (FC: 2.2, p = 0.04) expression when compared to cells expressing ERP29. Conversely, miR-4421 inhibitor decreased the expression of SOS1 (FC: 0.2, p = 0.03), MAPK1 (FC: 0.4, p = 0.01), and AKT1 (FC: 0.2, p = 0.04) compared to the negative control. **Conclusion:** Inhibition of ERP29 expression may impact MAPK/Akt pathway, contributing to PC patients' poor survival. However, these effects could be reversed by inhibiting the binding of miR-4421 to ERP29. Our study enhances the understanding of PC progression and CDDP resistance, and we hope that our findings will aid in the development of targeted therapy for PC patients by ensuring ERP29 expression. **Acknowledgements:** The study was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq grant numbers 140019/2020-0, 307944/2022-0, and 408177/2023-3) and Fundação de Apoio ao Ensino e à Pesquisa do Estado de São Paulo (FAPESP grant number 2023/12810-9) - Cancer Theranostics Innovation Center, (CancerThera) (CEPID FAPESP grant number 2021/10265-8).

Keywords: ERP29, MAPK/Akt pathway, miR-4421, Pharyngeal cancer.

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PAPEL DO PET/CT COM 18F- FDG NA AVALIAÇÃO DO COLANGIOCARCINOMA: UM ESTUDO RETROSPECTIVO

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R E S U M O

Introdução/Justificativa: O colangiocarcinoma é uma neoplasia maligna do trato biliar com prognóstico geralmente desfavorável. O diagnóstico precoce e o estadiamento preciso são cruciais para o manejo adequado desses pacientes. A tomografia por emissão de pósitrons/tomografia computadorizada (PET/CT) com 18F-fluordesoxiglicose (FDG) tem se mostrado uma ferramenta promissora na avaliação dessa doença, porém seu papel ainda não está completamente estabelecido. **Objetivos:** Este estudo visa avaliar o impacto do PET/CT com 18F- FDG no estadiamento do colangiocarcinoma, com foco na detecção de envolvimento linfonodal regional e doença metastática à distância. **Materiais e Métodos:** Realizamos um estudo retrospectivo utilizando um programa de busca de expressões no laudo RIS, com as palavras-chave "CID 10 C22" e "colangiocarcinoma", no período de 01/01/2019 a 01/01/2023. Inicialmente, 176 exames foram identificados, resultando em 71 exames após remoção de duplicidades. Excluímos ainda 5 exames que utilizaram outros traçadores, além de 2 pacientes por apresentarem colangiocarcinoma como tumor sincrônico durante avaliação de outro câncer primário, totalizando 64 exames elegíveis. Os exames foram classificados de acordo com suas indicações: • Estadiamento: 27 exames • Reavaliação: 31 exames • Diagnóstico diferencial de lesão hepática: 4 exames • Outros tumores hepáticos: 2 exames Focamos nossa análise nos 27 exames realizados para estadiamento, avaliando o impacto do PET/CT na detecção de envolvimento linfonodal e metastático. **Resultados:** Avaliação Linfonodal Regional: • Exames positivos: 11 pacientes (40,7%) • Exames negativos: 16 pacientes (59,3%) Os sítios de linfonodos regionais que apareceram nos estudos foram: ducto hilar, cístico, ducto biliar comum, artéria hepática, pancreaticoduodenal posterior e linfonodos da veia porta. Avaliação Metastática: • Exames positivos: 14 pacientes (51,9%) • Exames negativos: 13 pacientes (48,1%) Distribuição dos Sítios Metastáticos: 1. Pulmão: 5 pacientes (35,7%) 2. Osso: 5 pacientes (35,7%) 3. Linfonodos abdominais: 8 pacientes (57,1%) 4. Carcinomatose peritoneal: 2 pacientes (14,3%) 5. Linfonodos torácicos: 1 paciente (7,1%) 6. Adrenal: 1 paciente (7,1%). **Conclusão:** O PET/CT com 18F-FDG demonstrou ser uma ferramenta valiosa no estadiamento do colangiocarcinoma, detectando envolvimento linfonodal regional em 40,7% dos casos e doença metastática em 51,9% dos pacientes. A técnica foi particularmente útil na identificação de metástases em diversos sítios, com destaque para linfonodos abdominais, pulmão e ossos. Esses achados sugerem que o PET/CT com 18F-FDG pode ter um impacto significativo no manejo clínico desses pacientes, potencialmente alterando a estratégia terapêutica em casos onde a doença metastática não era previamente suspeitada.

Palavras-chave: 18F-FDG PET/CT, Colangiocarcinoma, MEDICINA NUCLEAR, Oncologia, PET/CT.

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COMPARATIVE RADIOLABELING OF THE CYCLIC PEPTIDE CTHRSSVVC WITH [68GA] GALLIUM AND [18F]FLUORINE. A POTENTIAL PROBE FOR MOLECULAR IMAGING OF CD163^{+} MACROPHAGES

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A B S T R A C T

Introduction/Justification: CD163⁺ macrophages play a critical role in chronic inflammation, cancer, and hematologic disorders, making them a promising target for molecular imaging. These cells contribute to tumor immunosuppression, disease progression, and poor prognosis in solid and hematologic tumors. Recent studies indicate that CD163 is a relevant biomarker in Hodgkin's lymphoma, multiple myeloma, and leukemias, which are directly associated with tumor resistance and immune evasion. The cyclic peptide CTHRSSVVC has been identified as a CD163 ligand, showing high reactivity with inflammatory and atherosclerotic lesions, suggesting its potential for targeting CD163⁺ macrophages. In vitro assays demonstrated that [111In]In-DOTA-CTHRSSVVC binds to atherosclerotic plaques, further supporting its applicability in molecular imaging of inflammation and cancer. Cyclic peptides are widely used in radiotracer development due to their high specificity, enzymatic stability, and resistance to degradation. Radiolabeling of these peptides with PET radioisotopes such as 68Ga3+ and [^{18}F]AlF2+ expands their potential applications in tracking inflammatory processes and hematologic malignancies. **Objectives:** To evaluate the radiolabeling efficiency and chemical stability of the NOTA-CTHRSSVVC cyclic peptide with 68Ga3+ and [18F]AlF2+, aiming to develop a novel radiopharmaceutical for molecular imaging of CD163⁺ macrophages. **Materials and Methods:** The NOTA-CTHRSSVVC conjugate was radiolabeled [68Ga]Ga(AcO)3 or [18F]AlF2+, which were prepared in 0.2 M sodium acetate buffer (pH 4.1); reactions carried out under different peptide amounts. When necessary, the final products were purified using solid phase columns. The radiochemical efficiency was assessed by HPLC coupled with a gamma radiation detector, while chemical stability was evaluated in the labeling solution for up to 4 hours. The partition coefficient (logP) was determined in n-octanol/water system, in triplicate. **Results:** The NOTA-CTHRSSVVC peptide was successfully radiolabeled and purified with the [68Ga]Ga-NOTA-CTHRSSVVC exhibited a radiochemical purity of 97.8% (n = 3), while [18F]AlF-NOTA-CTHRSSVVC reached 95.5% (n = 3). Both radiolabeled peptides demonstrated high chemical stability, maintaining their integrity for up to 4 hours in physiological solution. The logP analysis indicated a hydrophilic profile with the value of -3.08 ± 0.16. **Conclusion:** The radiolabeling of the NOTA-CTHRSSVVC peptide with 68Ga3+ and [18F]AlF2+ was efficient and stable, demonstrating chemical feasibility for the development of a novel radiopharmaceutical. Given the potential interaction of the peptide with CD163, future investigations may focus on assessing its biological affinity and molecular imaging applications for CD163⁺ macrophages in hematologic and inflammatory diseases.

Keywords: Macrophage, Peptide, Radiolabeling, [18F]fluorine, [68Ga]gallium.

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IN VITRO POPULATION GROWTH OF HUMAN GLIOBLASTOMAS: REAL PATIENTS AND CURVE FITTING

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A B S T R A C T

Introduction/Justification: For more than a century, a variety of ordinary differential equation growth models have been used to describe and predict the proliferation of human malignancies. Indeed, in the field of mathematical oncology, the growth of cell populations over time is typically represented by sigmoidal functions, such as logistic or Gompertz curves and their generalizations. These models are particularly focused on understanding and predicting the proliferation of cancer cells, including those from human glioblastomas, which can be very aggressive brain tumors with a survival rate of less than two years. **Objectives:** This research examines in vitro cell cultures of five lines of human glioblastoma using curve fitting and numerical parameter estimation of real datasets to separately describe the growth profile of all these cell populations lineages over time. **Materials and Methods:** Cell culture experiments were performed in the Advanced Therapeutics Laboratory at FCF-UNICAMP. These included a well-established human glioblastoma cell line (NG97) and four other glioblastoma cell lines derived from clinical patients designated N07, C03, L09 and J01. Twelve repeated time series of experiments were collected for each cell line. Cell counting was performed daily on days 1 to 6. The drda R package was used for curve fitting of the measured data aiming to determine the intrinsic growth rate and other parameters for each of the five cell lines. The 5-parameter generalized logistic curve was used, and all the resulting models were analyzed under statistical criteria such as the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). **Results:** Curve fitting analysis revealed significant diversity in the population growth of different cell lines. The drda R package proved to be highly effective in capturing these different behaviors and the unique sigmoidal shapes associated with them. Notably, the population growth of NG97 cells showed the least variability over time, with the