Keywords: 18F-FDG PET/CT, Cerebellum, Segmentation, SUV, Whole-Brain.

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FDG PET/CT AND PSMA PET/CT IN MUSCULOSKELETAL SOFT TISSUE SARCOMAS

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A B S T R A C T

Introduction/Justification: Soft tissue musculoskeletal sarcoma (STS) is a rare and varied class of mesenchymal-derived malignancies. Due to its histopathological heterogeneity and presence in different body locations, its diagnosis and treatment continue to present a significant medical challenge. In nuclear medicine, 18F-FDG PET/CT (FDG PET/CT) has been used to grade sarcomas, predict their prognosis, and assess therapy response. Although prostate-specific membrane antigen (PSMA) has been mainly used to detect prostate cancer metastases with PSMA PET/CT imaging and treat with 225Ac/177Lu-PSMA, this antigen has been shown to accumulate in non-prostatic tissues, including several types of sarcomas. **Objectives:** Evaluate the potential of PSMA PET/CT in diagnosing different types of STSs compared to FDG PET/CT, with the aim of expanding the clinical management of these patients and the potential of a Theranostics strategy with radiolabeled PSMA. **Materials and Methods:** Forty-four participants (20 females) with STS were prospectively enrolled and submitted to FDG PET/CT and PSMA PET/CT for primary staging, with a 48-hour interval between studies. SUVmax values were obtained in both studies of the primary STS lesion, locoregional lymph node metastases (LRLNs), distant lymph node metastases (DLNs), and bone metastases. SUVmax values among FDG PET/CT and PSMA PET/CT studies were normalized using the mediastinum SUVmax as a standard reference. The number of metastases detected by FDG PET/CT and PSMA PET/CT were also compared, as well as the absolute SUVmax values. **Results:** The absolute SUVmax values were higher on PSMA PET/CT compared to FDG PET/CT, respectively for the primary STS lesions (18.5 vs 12.8), for LRLNs (8.0 vs 4.5) and bone metastases (8.7 vs 3.2), while these values were similar for DLNs (3.0 vs 4.0). When the SUVmax values were normalized using the mediastinum as a reference the ratio comparing PSMA PET/CT to FDG PET/CT showed, respectively: 10.3 vs 5.3 for the primary STS; 4.7 vs 2.0 for LRLNs; 4.8 vs 2.9 for bone metastases; and 1.7 vs 1.7 for DLNs. PSMA PET/CT detected more LRLNs compared to FDG PET/CT (10 patients vs 7 patients, respectively) and more bone metastases (5 patients vs 3 patients). The detectability of DLNs was equal in both studies (7 patients). **Conclusion:** Our preliminary findings indicate that PSMA PET/CT is a potential diagnostic tool for staging sarcomas patients. Due to the high uptake in the primary STS lesions and metastases, there is a potential for a theranostics approach. This study received financial support from the São Paulo State Foundation for Teaching and Research Support (Cancer Theranostics Innovation Center, (CancerThera), CEPID FAPESP #2021/10265-8).

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

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ACHADOS METABÓLICOS PÓS VACINAÇÃO PARA COVID-19 EM PET-CT COM 18F-FDG

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R E S U M O

Introdução/Justificativa: O processo de vacinação em massa contra a COVID-19 levou ao surgimento, nos exames de PET-CT com 18F-FDG, de hipermetabolismo glicolítico nos linfonodos de drenagem regional do sítio de injeção. Nesse contexto, em função da dificuldade de diferenciação diagnóstica desses achados reacionais com lesões secundárias linfonodais, podem ser solicitados exames complementares confirmatórios (como seguimento por Ultrassonografia ou Tomografia) ou iniciados tratamentos baseados em eventuais falso-positivos. Nesse sentido, estudos e revisões passaram a indicar o reagendamento de PET-CT com 18F-FDG para até 6 semanas após a imunização. O presente estudo se justifica pela necessidade de uma melhor caracterização de tais efeitos morfometabólicos da imunização contra o SARS-CoV-2, observados no PET-CT com 18F-FDG, o que pode otimizar a diferenciação de achados caracteristicamente reacionais de outras hipóteses. **Objetivos:** O presente estudo tem o propósito de descrever os padrões de imagem observados ao PET-CT com 18F-FDG associados à resposta inflamatória que surge após a vacinação, com diferentes tipos de imunizantes contra o SARS-CoV-2, bem como investigar a incidência de linfonodos de drenagem regional com hipermetabolismo glicolítico de natureza reacional relacionados, alterações de forma dos mesmos, além da duração e magnitude de tais alterações. **Materiais e Métodos:** Foram avaliados, retrospectivamente, os exames de PET-CT com 18F-FDG e prontuários eletrônicos de 87 pacientes vacinados contra COVID-19, no ano de 2021, na cidade do Rio de Janeiro, sobretudo os imunizantes ChAdOxnCoV-19 (AstraZeneca – 36 pacientes) e Coronavac (Sinovac – 16 pacientes), quanto à forma do linfonodo de drenagem regional (normal x alterado), seus níveis metabólicos ao PET-CT, sua natureza (falso positivo para malignidade x reacional pós-vacina x normal) e a relação desses achados com o tempo desde a imunização, a idade e o tipo de

imunizante. **Resultados:** Houve o surgimento de graus variados de hipermetabolismo glicolítico em linfonodos de drenagem regional após a vacinação contra a COVID-19, em 27,6 % dos pacientes, com relação inversa do SUVmax ao número de dias desde a imunização (rs= -0,590 e p-valor ≤ 0,001 para o sítio de injeção; rs = -0,416 e p-valor = 0,013 para o linfonodo axilar) e à idade do imunizado (rs= -0,376; p-valor = 0,024).; evidencia ainda que tais achados foram extremamente infrequentes após 4 semanas de imunização. Ademais, os resultados do estudo demonstram menor incidência de achados metabólicos pós-vacinais (6,3%), naqueles pacientes vacinados com o imunizante Coronavac, sem nenhum achado equívoco para natureza reacional inflamatória ou neoplásica, para este grupo. **Conclusão:** O presente estudo demonstrou o surgimento de achados metabólicos reacionais pós-vacinais em PET-CT com 18F-FDG em pacientes imunizados contra o SARS-CoV-2, com relação inversa à idade e ao número de dias desde a imunização, bem como é um dos únicos a demonstrar menor repercussão da vacinação com o imunizante Coronavac nos estudos de PET-CT, uma vez que não levou a nenhum achado metabólico equívoco entre natureza reacional inflamatória e metabólica. Por fim, o trabalho demonstrou que a análise conjunta dos dados clínicos com os aspectos morfometabólicos observados ao PET-CT com 18F-FDG permite otimizar o diagnóstico diferencial de achados de natureza reacional e secundária.

Palavras-chave: 18F-FDG PET/CT, COVID-19, Vacinação.

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INDUCTION CHEMOTHERAPY IN ADVANCED HEAD AND NECK SQUAMOUS CELL CARCINOMA: A REAL-WORLD DATA STUDY

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A B S T R A C T

Introduction/Justification: Approximately 60% of HNSCC patients are diagnosed at a locally or locoregionally advanced stage. Patients with locally or locoregionally advanced stage and not amenable to surgical resection receive chemoradiotherapy (CTRT) as definitive treatment, or induction chemotherapy (ICT) followed or not by CTR. In the last scenery, docetaxel plus cisplatin (TP) and docetaxel plus cisplatin plus 5-fluorouracil (TPF) followed by CTRT were first described as effective ICTs regimens with acceptable safety profile. Despite the superiority of TPF over TP in response rate, loco-regional control, and survival of patients with advanced HNSCC, unequivocal disadvantages have been attributed to the regimen, as grade 3 or above adverse events, and the need of infusion devices or inpatient beds for continuous 5-fluorouracil infusion, which clearly increases the costs of treatment. **Objectives:** The current study aimed to analyze patients with locoregionally advanced HNSCC treated with TPF or TP followed by CTRT at the General Hospital of the University of Campinas, with the purpose of developing an ICT protocol applicable to services with limited resources. **Materials and Methods:** Patients with HNSCC at stage III or IVA-B (T4 and/or N2b, N2c or N3) treated with ICT using TPF or TP followed by CTRT from January 14 th, 2015, to November 24 th, 2021, were included in the study. The choice between TPF and TP as induction chemotherapy (ICT) was based on the clinical judgment of the responsible oncologist, considering patient-specific factors such as performance status, comorbidities, and tolerance to intensive regimens. Additionally, the availability of a hospital bed for the continuous intravenous infusion of 5-fluorouracil was a practical determinant. Toxicity, response rate, and event-free survival (EFS) and overall survival (OS) were evaluated in patients of both groups. Event-free survival (EFS) and overall survival (OS) were assessed using the Kaplan-Meier curves and the log-rank test. The impact of clinicopathological characteristics on patients' survival was assessed through univariate and multivariate Cox regression. **Results:** Eighty-seven patients with HNSCC were treated with ICT, being 38 with TPF and 49 with TP. An excess of ECOG 0 or 1 was seen in TPF group and an excess of males in TP group, but no significant differences in age, smoking and alcohol intake, body mass index, tumor location, grade and TNM stage, toxicities grade 3 or above, treatment response, and cycles interval, were seen in patients treated with TPF and TP. The median follow-up time was 22.6 months (range: 1.2 to 93.8). The two-year and five-year EFS rates of patients of the total group were 33.8% and 25.3%, respectively. ICT regimens did not alter response to ICT, and patients' EFS and OS. Cox multivariate analysis identified stable or progressive disease (HR: 5.56) and interval between cycles ≥ 28 days (HR: 2.79) as predictors of lower EFS, and ECOG ≥ 1 (HR: 3.42), stable or progressive disease (HR: 4.67), and interval between cycles ≥ 28 days (HR: 2.73) as predictors of lower OS. **Conclusion:** Our findings indicate TP as a good treatment option for locoregionally advanced HNSCC, especially in socioeconomically limited settings.

Keywords: Head and neck squamous cell carcinoma (HNSCC), Induction chemotherapy, Response rate, Survival, Toxicity.

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PET/CT WITH 68GA-FAPI46 FOR THE DETECTION OF PRIMARY AND METASTATIC LESIONS IN PATIENTS WITH DIFFERENT TYPES OF CANCER. INITIAL EXPERIENCE

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