Chromatography (HPLC). The partition coefficient (Log P) and serum protein binding were determined, as well as the stability in saline and serum up to 90 min. After these studies, assays were carried out to determine the binding of the radiopharmaceuticals to "Staphylococcus aureus" bacteria. For the clinical study, the patient selected had a diagnosis of chronic osteomyelitis in the distal tibia, a positive blood culture for "Staphylococcus aureus" and a possible infectious/inflammatory process at the site identified by magnetic resonance imaging. The patient was injected intravenously with 281 MBq of 68Ga-DOTA-UBI to confirm the presence of an infectious process by PET-CT and the images were obtained 1 h post-administration. Resultados: The radiochemical purity (RP) of the radiopharmaceuticals after purification was 99.28±0.28% and 99.78±0.06% for 68Ga-NOTA-UBI and 68Ga-DOTA-UBI, respectively. Log P was -3.57±0.20 for 68Ga-NOTA-UBI and -3.63±0.17 for 68Ga-DOTA-UBI. Stability studies up to 90 min showed RP of 98.13±0.78% and 99.75±0.08% in saline; and 79.94±5.10% and 94.69±1.14% in serum, for 68Ga-NOTA-UBI and 68Ga-DOTA-UBI, respectively. The percentage of serum protein binding, evaluated at 30 and 60 min, was 59.90±1.21% and 53.45±2.16% for 68Ga-NOTA-UBI and 60.22±2.96% and 44.06±1.88% for 68Ga-DOTA-UBI, respectively. The binding of radiopharmaceuticals to "Staphylococcus aureus" revealed a direct relation to the amount of bacteria in the culture. Clinical images showed intense uptake of the radiopharmaceutical in the entire remnant of the talus and in the adjacent soft tissues of the left ankle. After scan, the secretion collected from the surgical site was cultured and the presence of "Staphylococcus aureus" was confirmed. **Conclusion:** The radiochemical and "in vitro" assays showed that the radiopharmaceuticals studied presented similar characteristics with the potential to be implemented in clinical practice. The clinical study showed that the UBI(29-41) fragment radiolabeled with 68Ga can be used as a potential biomarker for infectious processes, according to the availability of the chelating agent.

Keywords: 68Ga-DOTA-UBI, 68Ga-NOTA-UBI, Infectious processes imaging, PET-CT imaging, Ubiquicidin.

DUAL TIME PSMA PET/CT WITH DIURETICS AND CONTRAST TO DETECT PROSTATE CANCER PELVIC METASTASES: IS THERE A BENEFIT?

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Introduction/Justification: The renal excretion of PSMA radiotracer may render PSMA PET/CT imaging interpretation difficult to identify local recurrence and lymph node metastases in prostate cancer patients. **Objectives:** To evaluate the best acquisition method to increase the detection rate of local recurrence and pelvic metastases on PSMA PET/CT by performing dual time-point imaging (delayed imaging) after hyperhydration, diuretics, and contrast enhancement. **Materials and Methods:** Patients with prior history of prostate adenocarcinoma underwent PSMA PET/CT for primary staging or due to biochemical recurrence. PSMA PET/CT acquisition consisted of delayed pelvic imaging after hyperhydration, diuretics, and excretory-phase contrast. SUV values obtained in local recurrence lesions, locoregional lymph node metastases, and bone metastases in the early and delayed PSMA PET/CT images were compared. **Results:** A total of 182 patients (medians: age = 66.5; Gleason score = 7.0; total PSA = 1.5) underwent PSMA PET/CT. Twenty-one patients (12%) were scanned due to primary staging, and 161 patients due to biochemical recurrence (88%). Delayed images (with only hyperhydration, without contrast or diuretics) increased diagnostic certainty in identifying local recurrence in 26.6% of patients and locoregional lymph nodes in 25%. There was a significant increase in SUV values in the delayed images compared to early images in the local recurrence (p < 0.0001), locoregional lymph node metastases (p < 0.0001), and bone metastases (p < 0.0199). Adding excretory-phase contrast to the delayed images increased diagnostic certainty in identifying local recurrence in 9.4% of patients and locoregional lymph nodes in 8.3%. The use of diuretics only in delayed images (without excretory-phase contrast) increased diagnostic certainty in identifying local recurrence in 14% of patients; while for identifying pelvic lymph nodes increase was only mild (2.8%). The association of diuretics with excretory-phase contrast increased the diagnostic certainty in identifying local recurrence in 15.6% of patients and locoregional lymph nodes in 5.6%. **Conclusion:** Delayed PSMA PET/CT images increase the diagnostic certainty of identifying local recurrence and locoregional metastases in prostate cancer patients. The addition of diuretics increases diagnostic certainty and may be useful in selected cases. However, the addition of excretory-phase contrast (regardless of the use of diuretics) only mildly impacted diagnostic certainty and may be omitted.

Keywords: Câncer de prostata, PET-CT imaging, PSMA.

ARTIFICIAL INTELLIGENCE TO EVALUATE METABOLIC TUMOR BURDEN IN PRIMARY STAGING OF RECTAL CANCER WITH 18F-FDG PET/CT

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Introduction/Justification: The use of artificial intelligence using convolutional neural networks in clinical practice is