Keywords: Anti-EGFr peptides, Cancer, Radiolabeled peptides.

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COMPARATIVE STABILITY OF CT-BASED BONE VOLUME QUANTIFICATION USING 18F-FDG AND 68GA-PSMA PET/CT IN MULTIPLE MYELOMA

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A B S T R A C T

Introduction/Justification: Computed Tomography (CT) images obtained from hybrid nuclear medicine equipment have shown great potential for PET image segmentation. Previous studies in patients with Multiple Myeloma (MM) have demonstrated the feasibility of calculating bone volume (BV) from CT data in 18F-FDG PET/CT images. This segmentation technique allows for the extraction of variables such as mean Standardized Uptake Value (SUVmean), Percentage of Bone Involvement (PBI), and Intensity of Bone Involvement (IBI) across the entire skeleton. The aim of this study is to determine whether BV quantification based on CT Hounsfield units (HU) is stable across different radiotracers. **Objectives:** To compare BV calculations from PET/CT scans using 18F-FDG and 68Ga-PSMA in patients with MM. **Materials and Methods:** This study included 18F-FDG and 68Ga-PSMA PET/CT scans performed within a 1 to 8-day interval in 15 patients (53% male, mean age 66.7 ± 10.7 years) with biopsy- confirmed symptomatic MM. The study was approved by the local Ethics Committee (CAAE 91231918.0.0000.5404). BV was calculated using the Beth Israel plugin for PET image pre-segmentation, applying a threshold of HU > 100. The cropped PET images were converted to binary format using FIJI, followed by the application of a morphological closing image processing tool to include areas such as bone marrow within the binary contour. For 18F-FDG PET, the skull was excluded during pre-segmentation due to overlapping artifacts caused by cerebral uptake. Descriptive statistics were used to compare FDG and PSMA BV calculations for each patient, with individual percentage deviation assessed relative to the FDG-derived BV. The correlation between BV values was evaluated using Spearman's rank correlation coefficient (r_s), with a significance level of $p < 0.05$. **Results:** The average individual percentage deviation in BV between 18F-FDG PET/CT and 68Ga-PSMA PET/CT was 13 ± 3%, with a range of 7% to 20%. A strong positive correlation was observed between BV values ($p = 3 \times 10^{-10}$), with a very strong Spearman correlation coefficient ($r_s = 0.98$). **Conclusion:** Despite the exclusion of the skull in BV calculations for 18F-FDG, the results indicate a minimal decrease in BV compared to whole-skeleton BV derived from PSMA PET/CT. The very strong correlation between BV values for the two radiotracers suggests that the segmentation approach remains consistent across different PET tracers. Additionally, the proportional exclusion of the skull across patients supports the reliability of the method for BV quantification.

Keywords: 18F-FDG, 68Ga-PSMA, Bone Volume Quantification, Multiple Myeloma, PET/CT imaging.

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SERUM METABOLOMIC ANALYSES IN RECTAL CANCER PATIENTS: AN EXPLORATORY STUDY FROM A TIME-COURSE PERSPECTIVE

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A B S T R A C T

Introduction/Justification: Patients with colorectal cancer frequently develop cachexia, leading to severe depletion of skeletal muscle. Metabolomics, through the analysis of