ABSTRACT

Positron Emission Tomography/Computed Tomography (PET/CT) using ^{18}F-Fluorodeoxyglucose (^{18}F-FDG) is a widely utilized functional imaging modality in clinical practice, particularly in oncology. FDG uptake is quantitatively expressed as the Standardized Uptake Value (SUV), while image quality can be evaluated using the Signal-to-Noise Ratio (SNR). This study aimed to establish the quantitative profile of mean SUV (SUVmean) and SNR in normal organs as physiological references in ^{18}F-FDG PET/CT examinations. A retrospective observational study with descriptive and exploratory inferential approaches was conducted on 22 patients who met the inclusion criteria. SUVmean and standard deviation were measured in the liver, aorta, and paraspinal muscle using body weight–standardized Regions of Interest (ROI). SNR was calculated as the ratio between SUVmean and the standard deviation within the same ROI. The results showed that the liver had the highest SUVmean (1.43 ± 0.14) with the lowest coefficient of variation (9.93%), followed by the aorta (1.04 ± 0.16) and paraspinal muscle (0.41 ± 0.05). Liver and aortic SUVmean were significantly associated with uptake time ($p < 0.05$), while aortic SUVmean also showed a positive association with body mass index. The highest SNR was observed in the liver (6.97 ± 1.14), compared to the aorta (7.44 ± 1.53) and paraspinal muscle (5.04 ± 1.45), with the greatest variability found in the paraspinal region. No significant association was identified between physiological patient factors and SNR variation. In conclusion, normal organs, particularly the liver and aorta, demonstrate relatively stable SUVmean and SNR profiles under the applied protocol and may serve as preliminary quantitative references for PET/CT image quality evaluation.

Keywords: *FDG PET/CT; SUVrerata; SNR; normal organs*