

Quantifying the effects of iodine contrast media on standardised uptake values of FDG PET/CT images : an anthropomorphic phantom study.

ABSTRACT

This study aimed to quantify the amount of change in Standardised Uptake Values (SUVs) of PET/CT images by simulating the set-up as closely as possible to the actual patient scanning. The experiments were conducted using an anthropomorphic phantom, which contained an amount of radioactivity in the form of Fluorodeoxyglucose (FDG) in a primary plastic test tube and one litre saline bags, including the insertion of bony structures and another two test tubes containing different concentrations of iodine contrast media. Standard scanning protocols were employed for the PET/CT image acquisition. The highest absolute differences in the SUV_{max} and SUV_{mean} values of the saline bags were found to be about 0.2 and 0.4, respectively. The primary test tube showed the largest change of 1.5 in both SUVs; SUV_{max} and SUV_{mean}. However, none of these changes were found to be statistically significant. The clinical literature also contains no evidence to suggest that the changes of this magnitude would change the final diagnosis. Based on these preliminary data, we propose that iodine contrast media can be used during the CT scan of PET/CT imaging, without significantly affecting the diagnostic quality of this integrated imaging modality.

Keyword: Iodine contrast media; Standardised Uptake Values; PET/CT; SUV_{max}; SUV_{mean}.