Comparative study of radiolabeled ^{68}Ga DOTANOC acetate, ^{68}Ga PSMA-11, and ^{68}Ga RGD on 1, 2-dimethylhydrazine induced colon carcinoma in Sprague Dawley rats

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Abstract

Colon cancer is the third most commonly diagnosed cancer and the second most common cause of mortality. The survival rate can be increased by earlier diagnosis and a better treatment regimen. PET/CT has recently become a vital part of achieving this goal by providing more detailed information regarding tumor lesions than other techniques. A combination of FDG PET/CT has been used initially and proven to be of great benefit for the assessment of colon cancer. Due to some limitations of FDG, a new diagnostic tracer has to be introduced. Radiolabelled peptides are widely used nowadays for imaging cancer lesions. The present study aimed to compare the three radiolabelled peptides ^{68}Ga DOTA-NOC acetate, ^{68}Ga PSMA-11 and ^{68}Ga RGD efficiency on 1,2 dimethylhydrazine induced colon cancer in Sprague dawley rats by PET/CT imaging. Radiolabeling efficiency of ^{68}Ga with DOTANOC, PSMA, RGD peptides were evalauated and found to be good. PET/CT imaging were carried using three peptides in which ^{68}Ga PSMA-11 alone shows positive imaging. Other two peptides ^{68}Ga DOTA-NOC acetate and ^{68}Ga RGD were not able to image the tumor lesions. Plasma clearance were also evaluated and found higher tumor to background ratio and a low accumulation in non-target organs for ^{68}Ga PSMA. Thus on comparison, ^{68}Ga PSMA-11 peptide is more suitable for preclinical imaging of colon cancers.

Key words: PET/CT, ^{68}Ga DOTA-NOC acetate, ^{68}Ga PSMA-11, ^{68}Ga RGD, Colon cancer