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AIM:

The aim of this study was to assess the correlation between SUV values on 18F-FDG PET/CT studies with proliferative activity by the Ki-67/MIB-1 index in patients with suspected non-small cell lung cancer (NSCLC).

MATERIAL AND METHODS:

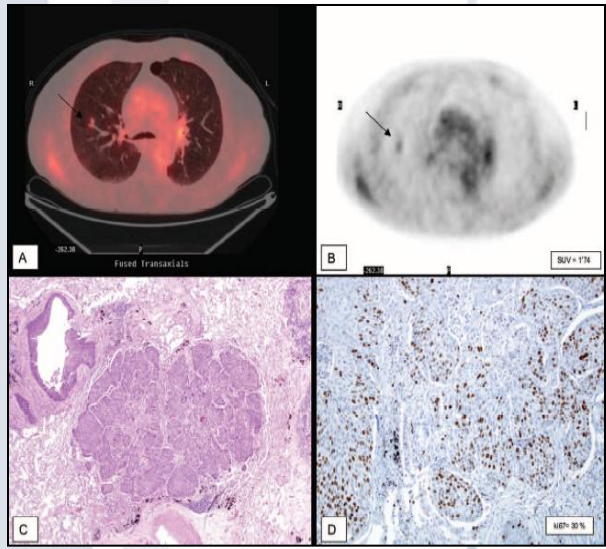
58 patients with suspected NSCLC (43 male) were studied. All had complete surgical resection and were diagnosed based on the WHO classification of NSCLC. adenocarcinomas n=29, bronchioloalveolar carcinomas n=2, squamous cell carcinomas n=16, large cell carcinomas n=7, carcinoid n=3 and mucoepidermoid carcinoma n=1. PET imaging was performed with hybrid PET/CT scanner 60 min after 370 MBq 18F-FDG administrations. Tumour lesions were identified as areas of focally increased uptake in the lungs. For semi-quantitative analysis, the maximum standardized uptake value (SUV) was calculated. Proliferating cell activity as indicated by the Ki-67 index was estimated in a section of surgically resected lung lesion. We compared SUV with their corresponding Ki-67 using linear regression analysis, in the total group and in small subgroups: With tumour lesions size at least 2 cm, in squamous carcinoma and adenocarcinoma subgroups.

RESULTS:

- PET/CT showed focal uptake in primary tumour in all cases.
- A low correlation was observed between SUV and Ki-67 ($r=0,6$; $p=0,001$) in the total group.
- A high correlation coefficient was observed in the tumour size at least 2 cm ($n=35$, $r=0,73$; $p=0,001$), similar to previous reports.^{1,2}
- In patients with benign pathology Ki-67 was < 1% and SUV <2.5 showing perfect correlation. Large cell carcinomas showed high SUV and high Ki67.
- No correlation was observed in adenocarcinomas subgroup ($n=29$; $r=0,30$) and low correlation in squamous subgroup ($r= 0,58$, $p=0,01$).

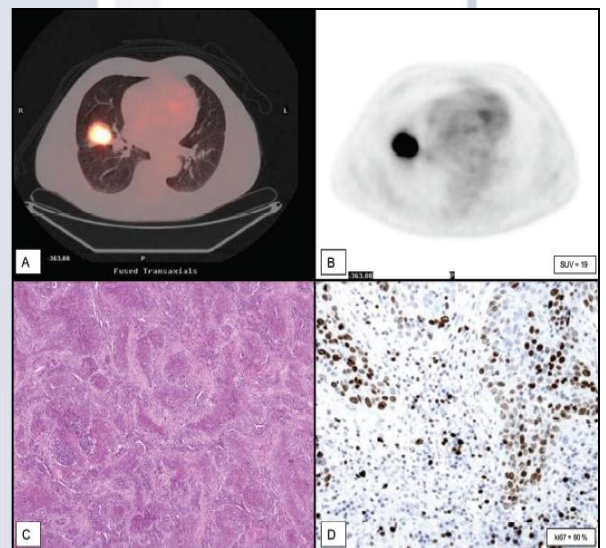
CONCLUSION:

The results of this prospective study demonstrated significant correlation between degree of every semi-quantitative uptake by SUV on 18F-FDG PET with proliferative activity by the Ki-67/MIB-1 index in the primary tumour in the subgroup with tumour size <2 cm in diameter.



A and B 18F-FDG PET images with low FDG uptake in the tumour (SUV: 1.74).

C Squamous cell carcinoma (8 mm diameter tumour)
D Proliferation rate (Ki-67) of 30 %.



A and B 18F-FDG PET images demonstrate high FDG uptake in the tumour (SUV: 19).

C and D Lymphoepithelioma-like carcinoma with proliferation rate (Ki-67) of 80 %.

1. D.Chen et al. Advances in PET of lung cancer. Proc Am Thorac Soc 2005; 2: 541-544.
2. Y.Yamamoto et al. Correlation of 18F-FLT and 18F-FDG uptake on PET with Ki67 in non-small cell lung cancer. Eur J Nucl Med Mol Imaging 2007; 34: 1610-1616