

Comparison of MET-PET and FDG-PET for differentiation between benign lesions and malignant tumors of the lung

Masayuki SASAKI,* Yasuo KUWABARA,* Tsuyoshi YOSHIDA,** Makoto NAKAGAWA,* Hirofumi KOGA,* Kazutaka HAYASHI,* Kouichirou KANEKO,* Tao CHEN,* Yuichi ICHIYA*** and Kouji MASUDA*

*Department of Clinical Radiology, Graduate School of Medical Sciences, Kyushu University

**Department of Radiology, Fukuoka Children's Hospital and Medical Center for Infectious Disease

***Department of Radiology, Kokura Memorial Hospital

Objective: We retrospectively assessed and compared the usefulness of ^{11}C -methionine (MET)-PET with that of ^{18}F -FDG-PET for the differentiation between benign lesions and malignant tumors of the lung. **Methods:** We examined 101 patients with a suspected lung tumor including 79 patients with primary lung cancer and 22 patients with benign lesions. One hundred and forty PET studies (46 studies with MET-PET and 94 studies with FDG-PET) were performed. Both MET-PET and FDG-PET were performed on 39 patients. The MET-PET was performed 15 minutes after the administration of 67–740 MBq of MET, and FDG-PET 45 minutes after the administration of 30–437 MBq of FDG. The results were then evaluated by the standardized uptake value (SUV). **Results:** The MET uptake in lung cancer was 3.69 ± 1.22 ($n = 37$) which was significantly higher than that in benign lesions 1.81 ± 1.04 ($n = 9$) ($p < 0.001$). The sensitivity, specificity and accuracy of MET-PET were 83.8%, 88.9% and 84.8%, respectively, when 2.66 of SUV was used as the cutoff value. The FDG uptake in lung cancer was 5.94 ± 2.89 ($n = 75$) and was also significantly larger than that in benign lesions 2.46 ± 1.01 ($n = 19$) ($p < 0.001$). The sensitivity, specificity and accuracy of FDG-PET were 81.3%, 78.9% and 80.9%, respectively (cutoff = 3.20). The MET uptake in the lesions correlated significantly with FDG uptake ($r = 0.71$, $p < 0.001$). According to an ROC analysis, the area under the curve for MET-PET (area = 0.833) was higher than that for FDG-PET (area = 0.828), but the difference was not statistically significant. Furthermore, the combined use of MET-PET and FDG-PET did not improve the diagnostic ability. **Conclusions:** In conclusion, both MET-PET and FDG-PET were considered to be equally useful for the differential diagnosis of lung tumors. Furthermore, MET uptake in lung lesions was found to correlate significantly with FDG uptake.

Key words: lung cancer, ^{11}C -methionine, ^{18}F -FDG, PET