

Capability of FDG-PET in Detecting Malignant Tumors in Hyperglycemic Patients

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Objectives

¹⁸F-fluorodeoxyglucose positron emission tomography (FDG-PET) is a modality for detection of tumors based on assessment of glucose metabolism in tumors. For this test, it is considered desirable that the blood glucose level is controlled to not more than 150 mg/dl immediately before FDG is injected. In practice, however, blood glucose control is sometimes poor due to the presence of pancreatic tumors, etc., resulting in unexpectedly high blood glucose levels. The present study was undertaken to evaluate the tumor detection rate and the true positive rate with FDG-PET performed in patients having high blood glucose levels.

Subjects and Methods

The study involved 62 patients (46 males and 16 females with a mean age of 62.5 years) whose blood glucose level was not less than 200 mg/dl immediately before FDG injection for FDG-PET. The target tumor checked by this test among patients suspected of having first-onset tumor (the first-onset group) was unidentified primary cancer in 6 cases, lung cancer in 6 cases, pancreatic cancer in 8 cases, malignant melanoma in 2 cases, malignant lymphoma in 1 case, colorectal cancer in 8 cases and esophageal cancer in 2 cases. Among the patients suspected of having recurrent tumor (the recurrence group), the target tumor was unidentified primary cancer in 1 case, lung cancer in 7 cases, pancreatic cancer in 2 cases, malignant melanoma in 3 cases, malignant lymphoma in 15 cases, colorectal cancer in 9 cases and esophageal cancer in 2 cases. On the day when this test was carried out, no patient received an insulin dose. In all cases, the lesions had been checked by other modalities of other diagnostic imaging techniques, surgery and/or biopsy. The sensitivity, specificity and true positive rate with PET were evaluated.

Results

When this test was carried out in the presence of high blood glucose levels, the sensitivity, specificity and true positive rate were 71%, 83% and 73% for the first-onset tumor group and 76%, 81% and 79% for the recurrence group, respectively. In total for the two groups, this test had a sensitivity of 73%, a specificity of 82% and a true positive rate of 77%. When the performance of this test to check for lung or pancreas cancer in hyperglycemia-free patients is compared with the results obtained with hyperglycemic patients in the present study, the sensitivity and true positive rate were lower but the specificity was comparable.