CLINICAL RELEVANCE OF STANDARDIZED UPTAKE VALUE IN THE DETECTION OF MALIGNANT LIVER LESIONS

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The liver is commonly involved with metastatic disease and often with primary tumours. The important role of [^{18}F] fluorodeoxyglucose (FDG) positron emission tomography (PET) is the detection and characterisation of malignant tumours and differentiation from benign liver lesions. However, detection of liver tumours is sometimes hampered by the patchy FDG uptake in many patients. The aim of this study was to assess whether the standardised uptake value (SUV) can improve the accuracy of visual assessment of malignant liver lesions during FDG PET imaging. The study retrospectively reviewed 20 patients, 12 females and 8 males, aged between 30 and 79 year, referred for FDG PET imaging to Nuclear Medicine Department, Hammersmith Hospital, London, for staging, detection of recurrence or for potential treatment of hepatic lesions. The patients have been diagnosed to have the following tumours and liver metastases: colorectal tumour with liver metastases (7), lung cancer (4), Hodgkin's lymphoma (3), hepatocellular carcinoma (2), Cholangiocarcinoma (1), gastrointestinal stromal tumour (1), carcinoid (1), duodenal carcinoma (1).

PET scan was performed using dedicated PET scanner (ECAT, Siemens) one hour after weigh adjusted dose of FDG was injected. Maximal SUV normalised to body weight was obtained from all coronal images of the liver. Regions of interest were placed on clearly visualised lesions, or areas that correspond to CT abnormalities but with no visual evidence of high FDG uptake. All these were compared with regions of interest over normal liver tissue. In patients with multiple liver lesions, the one with the highest SUV was chosen for comparison.

A total of 39 liver lesions were detected by FDG PET. Eight out of 20 patients had solitary liver lesion while others had 2 or more liver lesions. Five out of 20 patients showed obvious abnormal focal liver uptake with markedly higher mean SUV of 14.3 compared to the mean SUV of 3.9 for the normal liver tissue. In 15 patients there was less pronounced FDG uptake when assessed visually, but the mean SUV was significantly higher at 5.7 compared to normal liver tissue (SUV 3.2).

Our results have shown that in cases of liver malignancies that have no clear evidence of increased FDG uptake when assessed visually, due to the patchy pattern of uptake in some individuals, the quantification of SUV can play a role in characterising these lesions and confirming their malignant nature.