11C choline positron emission tomography

Five articles comprising 6 studies with total 118 patients (134 scans) were enrolled for a metaanalysis. There was no heterogeneity or publication bias among the included studies. The pooled sensitivity and specificity were 0.87 (95% confidence interval [CI]: 0.78, 0.93) and 0.820 (95% CI: 0.69, 0.91), respectively. The pooled diagnostic odds ratio was 35.50 (95% CI: 11.70, 107.75). The area under the curve was 0.9170 (95% CI: 0.8504, 0.9836), with Q* index equaling to 0.8499. The diagnostic accuracy of each subgroup showed no statistical differences with that of the overall group.

This meta-analysis indicated 11C-choline has high diagnostic accuracy for the identification of tumor relapse from radiation induced necrosis in gliomas 1).

The results of 11C-choline positron emission tomography (PET) in 22 patients suspected of having brain tumours were compared with the findings of contrast-enhanced magnetic resonance (MR) imaging and fluorine 18 fluordeoxyglucose PET. A histopathological diagnosis was made for each patient during open surgery. The standardised uptake values of brain tumours and the tumour-to-white matter count (T/W) ratios were determined. The degree of 11C-choline accumulation noted in PET images was compared with the gadolinium-enhanced areas of MR images. The mean T/W ratio of 11C-choline in high-grade gliomas was found to be higher than that in low-grade gliomas. This difference was statistically significant (mean+/−SD: 8.7+/−6.2, n=9 versus 1.5+/−0.7, n=5, P<0.03) when data pertaining to the prominent uptake of 11C-choline in a patient with a pilocytic astrocytoma were excluded. 11C-choline PET failed to detect non-neoplastic lesions in two patients. Areas of 11C-choline accumulation in PET scans were larger than areas enhanced on MR images in five cases involving high-grade gliomas. 11C-choline PET differentiated between low-grade gliomas and high-grade gliomas, but did not differentiate between low-grade gliomas and non-neoplastic lesions. The combination of 11C-choline PET and MR imaging may provide investigators with an accurate means by which to identify high grade gliomas 2).

Epileptogenic foci

A new role of 11 C-Choline PET in localizing the epileptogenic foci in insular cortex in the patients 3).


