Correlation of early-phase ^{18}F -florbetapir (AV-45/Amyvid) PET images to FDG images: preliminary studies: reply to Ballinger

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Dear Sir,

We write in reply to Dr. Ballinger's letter to the editor. We appreciate his interest in our paper [1]. Dr. Ballinger's letter raises important issues of flow/metabolism coupling.

We thank Dr. Ballinger for providing more evidence on early-phase images that can deliver extra information on perfusion in addition to tracer binding information. We agree that although blood flow and metabolism may be coupled in most conditions and regions, information on perfusion provided in early-phase images is not completely equal to information on metabolic function provided by FDG imaging. The reason for this is that there exist disruption/alternation mechanisms and observed discordance between flow and metabolism. These phenomena are discussed in our paper [1].

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However, to obtain maximum information from early-phase images, early-phase pAV45 images were optimized to uptake patterns of relative cerebral blood flow (rCBF) and ^{18}F -FDG images, and the resulting perfusion-like images showed a high correlation with ^{18}F -FDG images (average voxel-wise correlation $R > 0.92$) [1]. Similarly, comparable results between rCBF, early-phase images, and ^{18}F -FDG metabolic information were also observed for ^{11}C -PIB [2, 3].

In conclusion, our preliminary result does not imply that early-phase pAV45 imaging provides glucose metabolic information as does ^{18}F -FDG imaging, but instead that early-phase pAV45 images (with time frames optimized by correlation to activity distributions of rCBF and ^{18}F -FDG images) exhibit patterns that are highly correlated with those of ^{18}F -FDG images. Further, the results show that pAV45 images may show comparable diagnostic power to that of ^{18}F -FDG images. Nevertheless, further study is necessary to explore the diagnostic value of the perfusion information from pAV45 imaging in addition to information on amyloid binding, and also in comparison to that provided by ^{18}F -FDG imaging.

References

1. Hsiao I-T, Huang C-C, Hsieh C-J, Hsu W-C, Wey S-P, Yen T-C, et al. Correlation of early-phase ^{18}F -florbetapir (AV-45/Amyvid) PET images to FDG images: preliminary studies. *Eur J Nucl Med Mol Imaging*. 2012;39:613–20. doi:10.1007/s00259-011-2051-2.
2. Meyer PT, Hellwig S, Amage F, Rottenburger C, Sahm U, Reuland P, et al. Dual-biomarker imaging of regional cerebral amyloid load and neuronal activity in dementia with PET and ^{11}C -labeled Pittsburgh compound B. *J Nucl Med*. 2011;52(3):393–400.
3. Rostomian AH, Madison C, Rabinovici GD, Jagust WJ. Early ^{11}C -PIB frames and ^{18}F -FDG PET measures are comparable: a study validated in a cohort of AD and FTLN patients. *J Nucl Med*. 2011;52(2):173–9.