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STUDY OF ASSESSMENT OF 18F-FDG IN APOE-/- MICE ATHEROSCLEROTIC PLAQUES BY AUTORADIOGRAPHY

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Objective To investigate the possibility of application of nuclide on the ApoE$^{-/-}$ mice plaque, we used ^{18}F-FDG to image the plaque and elucidate the correlation between the nuclear imaging and histological imaging, estimate the feasibility of ^{18}F-FDG on detecting vulnerable plaque.

Methods Eight-week-old male ApoE$^{-/-}$ mice were fed with western diet (was provided by academy of military medical sciences) till 44 weeks as experimental group. After fasting for (10 to 12) h, 0.56 to 0.71mCi ^{18}F-FDG was injected into the mice tail vein. At 30 min after injection of the radiotracer, we sacrificed the mice and removed the aortas, incised longitudinally. Aortas were weighted, and radioactivity was measured with a well-type γ-counter, the results were expressed as the SUV. Then macroautoradiographies were acquired, aorta plaque and macrophage were investigated by examination of stained sections by Red-O staining and CD68 staining. Harvestings of aortas for en face analysis were performed with oil Red-O to compare with atuoradiography, and CD68 staining to compare with SUV. The control group C57BL/6N mice were fed with full diet, and the rest work were alike.

Results There was a significant difference (0.243±0.054 vs 0.112±0.004, t=4.108, p=0.002) in the uptake of ^{18}F-FDG between experimental group and control group. Control group were negative result. Macrophage (Mf) number between experimental group and control group was significant different (4.99±0.51 vs 9.87±0.31, t=2.263, p=0.037), and the ^{18}F-FDG uptake and macrophage (Mf) number in thoracic aortic segments had a strong correlation (r=0.835, p=0.0002), but the en face measurements of aortas isolated 30 min after ^{18}F-FDG injections (5.848±2.416:1) demonstrated a weaker correlation between fat stainings and autoradiographies (r=0.4697, p=0.001). Macrophage (Mf) number in visualisation plaque was significantly different from the unvisualisation plaque (4.29±0.42 vs 10.85±1.47, t=10.55, p=0.015).

Conclusions The uptake of ^{18}F-FDG in aorta plaque was enhanced and had higher specificity than non-target tissue. The uptake of ^{18}F-FDG had a strong correlation with Mf number, but the correlation between SUV and the en face of plaque is weak.