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# From SPM8-based to SPM12-based Attenuation Correction for Brain PET/MR Imaging

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We evaluated whether applying SPM12 instead of SPM8 to delineate bone, soft tissue and air for head MR-based attenuation correction (MRAC) would be feasible. The differences in bone delineation between SPM8- and SPM12-based MRAC methods were studied by visual analysis and evaluation of dice coefficients against CT-based attenuation correction (CTAC). The quantitative accuracy in PET was evaluated in volume of interest (VOI) analysis using 35 regions in the gray matter. The results show slightly improved bone overlap in SPM12-based MRAC, with Dice coefficient of 0.80±0.04 compared to 0.77±0.05 in SPM8-based MRAC. The mean relative difference in PET uptake across all VOI regoins was -2.53±1.8 % in SPM8-based MRAC and -1.77±1.72 % in SPM12-based MRAC, as relative to CTAC. In conclusion, using SPM12 for head MRAC is feasible to create MR-based attenuation maps with bone, soft tissue and air and offers slight improvements over SPM8 in bone delineation and quantitative accuracy in PET.

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