is possible to reliably achieve an automatic analysis of FDOPA uptake in brainstem and diencephalon nuclei. The method is independent of the injected tracer, which broadens its scope. **References:** None.

EP-0877

Is I-123-MIBG cardiac SPECT-CT with attenuation and scatter correction a useful tool for the diagnosis of prodromal Lewy body disease compared to planar scintigraphy?

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Aim/Introduction: 123-I MIBG (meta-iodobenzylguanidine) cardiac imaging for sympathetic denervation is a validated diagnostic biomarker for dementia with Lewy bodies (DLB) and is listed as an indicative biomarker in the 2017 international consensus criteria for DLB diagnosis. There has been very little research in the diagnostic accuracy of cardiac MIBG in the prodromal stages of DLB or in the advantage of attenuation and scatter corrected SPECT-CT compared to planar imaging. We aimed to evaluate this in subjects with either MCI due to Lewy body disease (MCI-LB) or due to Alzheimer's disease (MCI-AD). **Materials and Methods:** An anthropomorphic chest phantom was filled with I-123 solution using activities typical of healthy subjects. The phantom was scanned on a Siemens Intevo with MELP collimators using both planar and SPECT-CT techniques. Further scans were acquired with a PMMA chest plate added, then breasts. The SPECT-CT images were reconstructed using OSEM with resolution recovery, attenuation and scatter correction (ACSC) applied.Twenty-nine healthy controls, 24 MCI-AD and 32 MCI-DLB subjects aged over 60 years were recruited and assessed clinically as part of a research study. Their diagnoses were confirmed by a panel of three expert old age psychiatrists. All were administered 111±10% MBq I-123-MIBG and imaged at 4 hours ±30 minutes using standard planar imaging, followed by SPECT-CT. SPECT images were reconstructed as above. The heart-to-mediastinum ratios on planar images (HMR_planar) were calculated using a circular cardiac region and rectangular mediastinum region, with corresponding spherical and cuboid regions for HMR_SPECT. **Results:** Phantom HMR_planar decreased by 20% with the PMMA plate added; 39% with plate and breasts. Cardiac counts with ACSC SPECT showed less dependence on phantom size than SPECT without ACSC (5% vs 33%). There was a significant linear relationship between HMR_planar and BMI ($p<0.01$, $R^2=0.44$) in healthy controls, but no significant relationship for HMR_SPECT ($p>0.1$, $R^2=0.03$). Healthy controls were used to provide reference ranges for HMR_planar and HMR_SPECT (mean±2SD). 20/24 MCI-AD cases had normal scans with planar and 21/24 with SPECT-CT. 17/32 MCI-LB cases were abnormal on both planar and SPECT-CT. The difference between mean HMR for normal and abnormal scans was much greater for SPECT-CT than planar. **Conclusion:** By reducing variation due to patient size, SPECT-CT improves separation between normal and abnormal cardiac MIBG scans, with a small improvement in MCI diagnostic accuracy. In clinical practice, SPECT-CT may be useful in borderline cases where the planar image result is unclear. **References:** None.

EP-0878

Comparison of Cortical Parcellation Based Asymmetry Index Calculation Methods in PET/MRI Epilepsy Diagnostic

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Aim/Introduction: Interictal ^{18}F-FDG PET has currently acknowledged the primary imaging modality for the presurgical metabolic assessment for focal epilepsy. Because of the localisation of the epileptic focus needs to be assessed at the individual patient level the Statistical Parametric Mapping (SPM) may be the best method for semi-quantitatively comparing a patient to a healthy database. Unfortunately, large datasets from healthy subjects are not yet available for ^{18}F-FDG PET/MRI, limiting the possibility of providing an accurate statistical evaluation of individual patient data. As an alternative, for quantifying the differences between hemispheres, the proposed application is the Asymmetry Index (AI) based seizure-zone localisation. The simultaneously measured functional and anatomical PET/MRI images and the availability of most advanced neuroimaging software allows the automatic evaluation of regional AI data in native space and MNI152 atlas space, as well. We aimed to compare the sensitivity of the native- and atlas space-based regional AI (rAI) calculation techniques with the SPM results in a selected temporal lobe epileptic patient's group. **Materials and Methods:** From our lab's FDG-PET/MRI Epilepsy Database we selected 36 patients (age ranges between 15 and 57, mean = 29.7 ± 10.1) whose large (> 3 cm^3) lateralised hypometabolic area was identified in the temporal lobe by SPM after the comparison with the control population of 19 subjects. In parallel with the SPM analysis, we generated Harvard-Oxford cortical atlas-based rAI data in MNI152 space (HO-rAI), and FreeSurefer segmentation (based on Desikan-Killiany Atlas) induced rAI in native-space (FS-rAI). We characterised the sensitivity of a rAI calculation methods by the maximal absolute value of rAI data measured in the temporal lobe regions. Because of the non-normality of data, we applied the paired Wilcoxon test to compare the rAI values, and Spearman's rank correlation coefficient to assesses the relationship between rAI and SPM's t-max value. **Results:** We found that the rAI calculation in atlas space resulted in significantly ($p = 0.0006$) higher rAI values than the native-space parcellation technique. We also found a strong correlation between t-max and HO-rAI (rho= 0.547, $p < 0.0001$) and FS-rAI (rho= 0.603, $p < 0.0001$). **Conclusion:** Although we consider the cortical parcellation in native space as a subject-specific region delineation method, the usage of these regions for detecting asymmetry in FDG-PET images is not so sensitive than the rAI calculation in MNI152 space. (Acknowledgement: This research was granted by the EFOP-3.6.2-16-2017-00008 project.) **References:** None.

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Correction of head motion and attenuation map realignment in PET/MR studies: comparison between PET-image based and EPI-image based methods

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Aim/Introduction: Dynamic PET is a method to analyze metabolic aspects of the brain using the time course of the activity distribution for deriving quantification parameters. In these studies, as data acquisition frequently lasts more than 1.0 h, head motion can degrade accuracy of the time activity curves (TACs), leading to erroneous quantification results. In addition, it also can lead to mismatches between the attenuation map and the subsequent PET frames affecting the final quantification. The aim of this work was to evaluate two head motion correction (MC) methods in a PET/MR study with [^{11}C]ABP688 bolus-infusion protocol. **Materials and Methods:** PET-image based method (M1): PET images were reconstructed according to a predefined framing scheme without attenuation and scatter corrections. For these dynamic images (non-MC), co-registration with respect to a reference image was done with PMOD [1] and the inverse rigid movement parameters were extracted and applied to each of the single attenuation maps. Subsequently, the Multiple Acquisition Frame (MAF) method [2] was used for image reconstruction using the matched attenuation maps. In a last step, the rigid transformation was applied to the attenuation corrected PET images generating the MC images. EPI-image based method (M2): EPI images (3 volumes) were repeatedly acquired during the dynamic PET study. They were acquired before and after the T1 anatomical acquisition (AC reference) at several timepoints before and after further MR sequences as part of an fMRI study during the last 30 minutes of the PET acquisition. For all EPI images, a realignment with respect to the very first EPI image was done with SPM12 [3] and inverse rigid movement parameters were extracted and applied to the static attenuation map. Subsequently, MAF was used for image reconstruction using the newly created dynamic and matched attenuation maps. Finally, rigid transformation was applied to the AC PET image frames of the entire dynamic acquisition. **Results:** We have evaluated the M1 method for a measurement using [^{11}C]ABP688 with 2.5 minutes frames during 65 minutes of PET acquisition [4]. After applying M1, visible misalignment between images disappeared and "jumps" in TACs were reduced. The M2 method is currently being analyzed. **Conclusion:** Both methods allows semi-automatic detection and compensation of inter-frame motion without additional tracking hardware. Both methods are expected to improve the accuracy of TACs in case of subject's motion in dynamic PET studies. **References:** [1] www.pmod.com/web/ [2] IEEE TMI, 16, 1997, 137-144. [3] ww.fil.ion.ucl.ac.uk/spm/software/spm12/ [4] DGN 2019, abstract P107.

EP-0880

Acquisition period of amyloid PET imaging using [^{18}F]Florbetapir can be compressed without alteringstandardized uptake value ratios

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Aim/Introduction: The durations of uptake and acquisition time for the positron emission tomography (PET) image using [^{18}F]Florbetapir differ according to the purpose. The recommended uptake time ranges from 30 to 50 min post-injection, then image acquisition takes 10 - 20 min thereafter. Therefore, the duration of the entire procedure can range from 40 to 70 min. The present study aimed to evaluate the accuracy of quantitative PET measures acquired over a shorter scanning using [^{18}F]Florbetapir. **Materials and Methods:** Images were acquired from nine individuals (mean age, 84.4 y) using a Discovery MI PET/CT system (GE Healthcare). The mean injected dose of [^{18}F]Florbetapir was 352.1 MBq and two 20-min scans were performed starting at 30 and 50 min post-injection. The datasets were reprocessed to produce the following sets of sinograms: 30 - 35, 30 - 40 and 30 - 50 min and 50 - 55, 50 - 60, and 50 - 70 min after radiopharmaceutical administration, then the images were reconstructed under clinical conditions. All [^{18}F]Florbetapir images were separately normalized to a standard [^{18}F]Florbetapir template using Amygo neuro software (FUJIFILM Toyama Chemical Co. Ltd.). Anatomical volumes of interest (VOI) were automatically placed on seven regions. Mean cortical (cSUVR) and regional (rSUVR) SUVR were calculated with the cerebellar value as the reference. A cSUVR of > 1.10 was defined as amyloid positive. Significant differences among cSUVR and rSUVR were determined using repeated measures one-way analysis of variance and Friedman tests. Values with