عنوان مقاله:

Metabolic Connectivity Based Parcellation of the Hippocampus in Healthy Older Adults

محل انتشار:

ششمین کنگره بین المللی نقشه برداری مغز ایران (سال: 1398)

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خلاصه مقاله:

The hippocampus is a core component of the human cognitive system whose connectivity and function are altered in the most frequent neurocognitive disorders. Accordingly, hippocampus' structure and function have been characterized using parcellation approaches based on local microstructural properties and MRI-based connectivity [1,2,3]. In the present study, for the first time, we aimed to complement these findings from insights of molecular imaging by implementing parcellation based on metabolic connectivity (MC-CBP) using FDG-PET data. Method The bilateral hippocampi were parcellated using a standard hippocampus mask, as well as connectivity based parcellation (CBP) pipeline used in a recent study [3]. FDG-PET data of 263 older adults (age: (74.39 ±5.95years, 48.28% females) from the ADNI cohort were normalized, partial volume corrected and smoothed. MC was measured by computing the Pearson's correlation in metabolism between hippocampus voxels (seed voxels) and all other brain voxels (target voxels) across the whole sample. This procedure yielded a seed voxel by target voxels connectivity matrix at the group level that was then used for clustering. For stability and consistency of parcellations, bootstrap resampling was utilized and the clustering was performed by assigning the hippocampal voxels to its most frequent cluster's label (i.e., by using the mode) across bootstrapping samples.Results We examined 6 levels of partitions ranging from k = 2 to 7 since previous work has reported stable cluster solutions at different level of partitions and compared them with previous studies [2, 3]. Organization of the hippocampus based on MC revealed primarily an anterior-posterior differentiation, but also a medial-lateral distinction in line with MRI-based parcellation in healthy adults. Conclusions In the future, MC-CBP could contribute to a better understanding of brain organization and to the ability to derive robust maps for FDG-PET data analyses.

کلمات کلیدی:

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