

The Association Between Hippocampal Subfield Volumes And Cognition In A Cohort Of Patients With Dementia In South London

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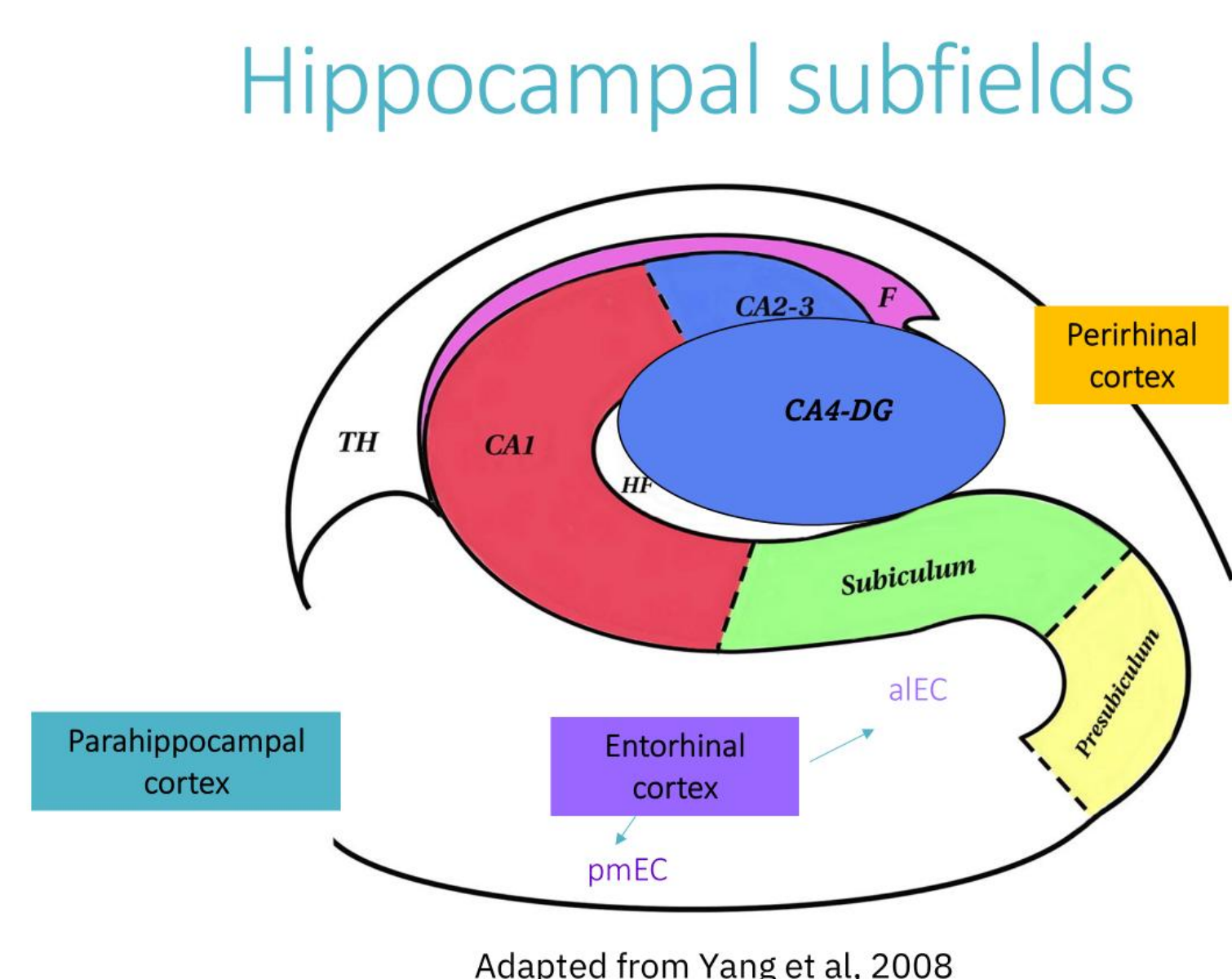
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Hippocampal subfield atrophy is seen in Alzheimer's disease in a large real-world cohort and perirhinal cortex volume is associated with cognitive scores.

INTRODUCTION

- Accurate differentiation between dementia subtypes is important, especially when considering anti-amyloid immunotherapy
- High-resolution MRI studies suggest hippocampal subfield specific atrophy (cornu ammonis(CA)1-4, subiculum, dentate-gyrus (DG)) may differentiate subtypes and correlate with cognition. [1]
- Novel machine learning allows visualisation of subfields from routine clinical 1.5T MRI data [2]



AIM

- characterise subfield atrophy in dementia subtypes in a real-world clinical cohort
- investigate associations between subfield volumes, cognitive and social functioning

METHODS

- Retrospective cohort
- Hippocampal subfields segmented from clinical MRI from SLam Image Bank using ANTSx-Deep-Flash pipeline
- ACE, MMSE and HONOS closest to MRI scan date obtained from electronic health records

RESULTS

3617 participants	MMSE data =235 participants
Mean age = 77.7	ACE data =958 participants
Male= 57%	HONOS =2973 participants

AD vs MCI	Hypothesis	Results (AD vs MCI)	
		Left	Right
Hippocampal:			
Subiculum	↓	↓***	↓***
DGCA2CA3CA4	↓	↓***	=
CA1	↓	=	=
Extrahippocampal:			
Parahippocampal	↓	↓***	↓***
Perirhinal	↓	↓*	↓***
pmEC	↓	↓***	↓***
alEC	↓	=	=

*=p<0.05, **= p<0.01, ***=p<0.001

Association with cognitive and social functioning scores

- MMSE =no significant correlation
- ACE
 - CA1 ↓= ACE ↑= improved cognition. Perirhinal ↓= ACE ↓= worse cognition
- HONOS
 - DGCA2CA3CA4 ↓, Parahippocampal ↓, perirhinal ↓, subiculum ↓= social functioning ↓

	MMSE	ACE	HONOS
Left CA 1	1.32	-4.74*	-0.52
Right CA 1	0.73	-4.81*	-0.41
Left DG CA2 CA3 CA4	7.79	1.52	-2.41**
Right DG CA2 CA3 CA4	3.78	3.26	-1.92**
Left subiculum	6.07	2.89	-2.09*
Right subiculum	5.26	0.91	-2.44**
Left perirhinal	1.73	5.29***	-0.78**
Right perirhinal	3.56	5.14**	-0.85
Left parahippocampal	0.78	0.78	-0.6***
Right parahippocampal	1.5	0.1	-0.41*

- DG/CA2/CA3/CA4 and subiculum significantly smaller in AD vs MCI and controls (p <0.001)
- ↑ perirhinal cortex volume = ↑ ACE
- Atrophy of several subfields = worse HONOS

CONCLUSIONS

- Further larger scale prospective research could assess potential of perirhinal volume in predicting cognitive decline, and relationships between HONOS and subfield volumes.
- We corroborated subfield-specific atrophy in Alzheimer disease, in a large real-world clinical cohort.

REFERENCES

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