Severely Deficient Autobiographical Memory: neuropsychological and fMRI insights from a case report

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Introduction

An extreme of the continuum concerning autobiographical memory (AM) functioning is known as Severely Deficient Autobiographical Memory (SDAM), a condition characterized by a selective impairment in re-experiencing personal events in healthy adults[1]. Here, we describe the case of MT, a 35-year-old woman who presents a difficulty in relieving personal events.

Methods

2019 — AM assessment: **Autobiographical Interview**[2] and **Autobiographical Fluency Task**[3]

Group	N (women)	Age (M/SD)	Education (M/SD)
HC	6	27.73/5.55	16/2.24
MT		35	16
		t=1.25	t=0
		p=0.12	p=0.50

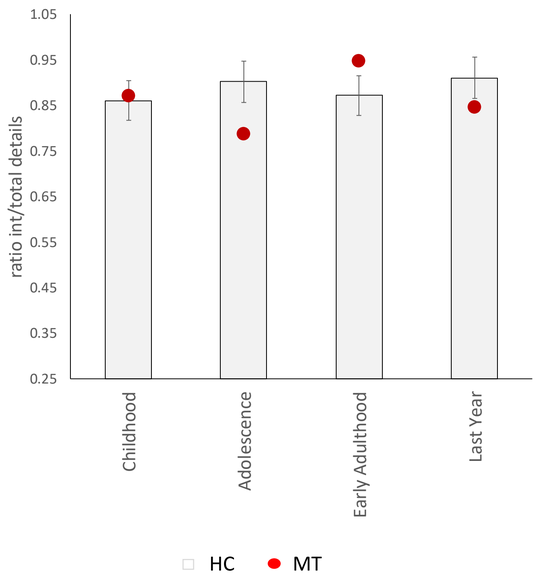
2023 — **Task-based fMRI protocol** investigating brain correlates of the temporal organization of episodic autobiographical memory. Stimuli to be presented during fMRI were collected using the Autobiographical Fluency Task[3].

Group	N (women)	Age (M/SD)	Education (M/SD)
HC	12	25.38/4.93	17.15/2.76
MT		35	16
		t=2.40	t=0.42
		p=0.02	p=0.34

2024 — **Neuropsychological assessment**

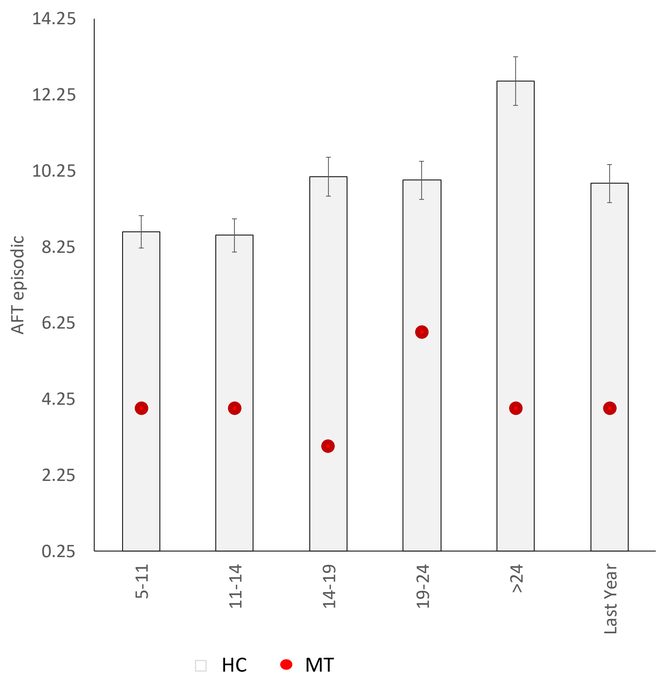
Results

Autobiographical Interview[2]



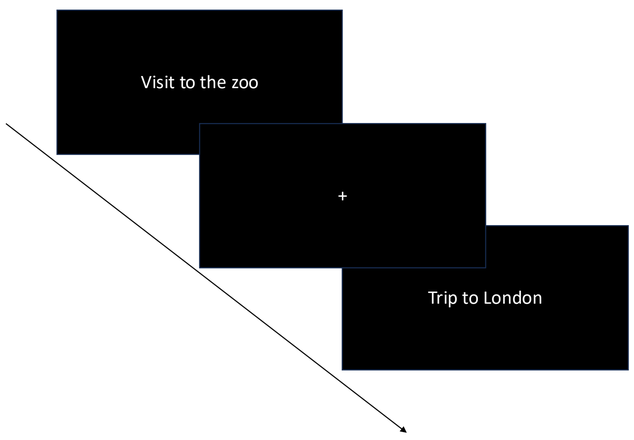
Results showed a significant **reduction** in the ratio for the **adolescence** (t=-2.34, p=0.03).

Autobiographical Fluency Task[3]



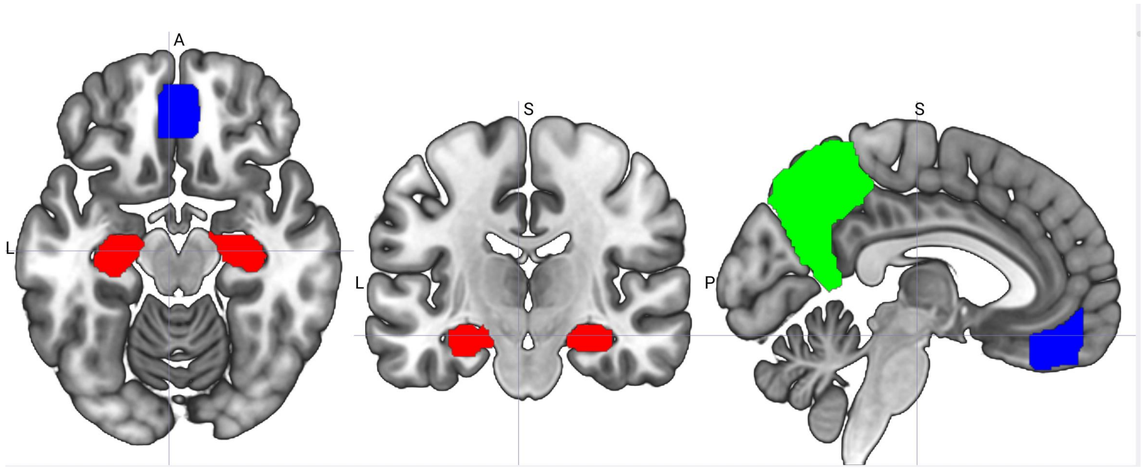
We found a limited ability in accessing events and a **significant reduction** regarding the 14-19 years old lifetime period (t=-1.82, p=0.05).

fMRI task and analyses



Example of stimuli presented to MT during the **fMRI.** During fMRI, MT was presented with labels referring to her past events or episodes relative to others, and she was asked to decide whether each label corresponded to her memories.

fMRI analyses were performed on core regions of the AM associated with SDAM: hippocampus, precuneus and medial frontal cortex. Results showed a significant **reduction** in the activation of the **right hippocampus** only for the **last year lifetime period** (t=-1.621, p=0.05).



Neuropsychological assessment: MT performed within the normal range in tasks assessing attention, language, executive functions, verbal and visuo-spatial short and long term memory and working memory. We found only a deficit in *memory for public events, delayed recall of figures and learning of a shape.*

Discussion

In conclusion, MT shows a specific reduction in rapidly accessing past personal events and in re-experiencing events of the adolescence. Also, we found a reduction in the activation of the right hippocampus when MT was asked to decide whether labels regarding the last year corresponded to her memories, suggesting alterations in how episodic autobiographical memories are represented across time.

[1] Palombo, D. J., Alain, C., Soderlund, H., Khuu, W., & Levine, B. (2015). Severely deficient autobiographical memory (SDAM) in healthy adults: A new mnemonic syndrome. Neuropsychologia, 72, 105e118. [2] Levine, B., Svoboda, E., Hay, J. F., Winocur, G., Moscovitch, M. (2002). Aging and autobiographical memory: dissociating episodic from semantic retrieval. Psychology and Aging, 17(4), 677-89. [3] Dritschel, B. H., Williams, J. M. G., Baddeley, A. D., & Nimmo-Smith, I. (1992). Autobiographical fluency: A method for the study of personal memory. Memory & Cognition, 20(2), 133–140.