Is Semantic Memory a clue to distinguish Alzheimer’s disease from late-life depression?

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Introduction

Late life depression (LLD) and Alzheimer’s disease (AD) are difficult to distinguish

- They share similar cognitive impairment in memory, executive functions and attention.
- The depressive symptoms (DS) are present in 20-30% of early AD.
- LLD can be part of prodrome or risk factor of AD.

Question 1: Does the presence of DS predict conversion to AD or incidence of AD?

AD has specific deficit of Semantic Memory

Present 5 years before the clinical diagnosis, it is linked to early atrophy of hippocampal complex in AD. This deficit is not supposed to be present in LLD.

Question 2.1: Is there an association between DS and performances at semantic tasks?

The presence of DS can be a risk factor of cognitive decline, or prediction to AD, according to their:

- SEVERITY
  - High severity of DS are predictive of conversion for:
    - Normal cognition (Ezzati, 2019, Gravina, 2013, MCI (Defrancesco, 2017, Donovan, 2014)
    - Amnestic MCI (Kida, 2016)

- ONSET

- SUBDOMAIN
  - Specific thymic subdomains are predictive of conversion:
    - High score of DS: domain at the NPI Q is predictive of cognitive decline in AD (Santacruz Escudero, 2019).
    - Depressive profile with high cognitive concern, withdrawal and hopelessness, and lower worry can predict AD in confrontation of other type of dementia (Shido, 2020).

Method

PRISMA guidelines for systematic review - Quality Assessment for quantitative studies.

Question 2.2: Is Semantic Memory differently affected by LLD and AD or MCI?

Research showing significant (*) differences between groups at performances to semantic tasks.

Question 2.3: Is there an association between DS and performances at semantic tasks?

The presence of DS is not a risk factor of conversion to AD for individuals who, in baseline have:

- Normal cognition (Jessen, 2011)
- Amnestic MCI (Summers, 2012)
- Non amnestic MCI (Kida, 2016, Summers, 2013)

Results

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Discussion

First, the results collected in this systematic review show that there is indeed a link to be determined between the different forms of LLD (according to their severity, their onset and their domain) and their impact on cognitive decline, or even on conversion to a neurodegenerative process.

Secondly, these data indicate that tasks which measure semantic memory give very mixed results on the comparison of LLD and AD (or MCI). However, these tasks require not only the integrity of the content of the semantic memory, but also the integrity of the executive processes involved.

In order to make a true distinction between the effects of LLD and AD on semantic memory, it seems essential to use protocols that allow the underlying processes to be distinguished. This aspect does not appear to have been covered yet in the literature.