WORD AND PICTURE VERSION OF THE FREE AND CUES SELECTIVE REMINDING TEST (FCSRT): IS THERE ANY DIFFERENCE?

A. Arighi[1], T. Carandini[1], G. Carpani[1], M. Mercurio[1], A. Pietroboni[1], G. Fumagalli[1], L. Ghezzi[1], P. Basilico[1], A. Calvi[1], M. Scarioni[1], S. P. Russo[1], M. De Riz[1], E. Rotondo[1], P. Corti[1], R. Vimercati[1], C. Fenoglio[1], M. Serpente[1], M. Bozzali[2], F. Triulzi[3], D. Galimberti[1], E. Scarpini[1].

1 - Neurodegenerative disease Unit, Fondazione Ca' Granda IRCCS Ospedale Maggiore Policlinico, Milan, Italy.
2 - Neuroimaging Laboratory, IRCCS Santa Lucia Foundation, Rome, Italy
3 - Department of Neuroradiology, Fondazione Ca' Granda IRCSS Ospedale Maggiore Policlinico, Milano, Italy

UNIVERSITÀ DEGLI STUDI DI MILANO

Background

An early and significant impairment of episodic memory is a core criterion for the diagnosis of Alzheimer's disease (AD)[1]. In clinical practice, the Free and Cues Selective Reminding Test (FCSRT) is the most commonly used neuropsychological test to evaluate episodic memory and to predict AD development in mild cognitive impairment (MCI) patients[2]. Two variants of FCSRT exist, using the recall of either word (FCSRT-w) or picture (FCSRT-p)[3]. We set a study to compare the two FCSRT variants in MCI patients and to assess their correlation with cerebrospinal fluid (CSF) soluble biomarkers and with brain atrophy.

Materials and Methods

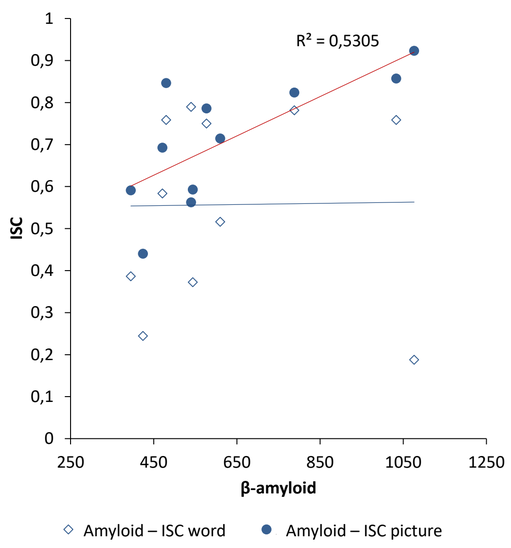
14 MCI patients underwent neuropsychological evaluation, testing both the word- and the picture-variant of FCSRT. All patients performed also a brain MRI with T1-weighted images, and a lumbar puncture to quantify CSF levels of the soluble biomarkers β-amyloid (β-A, a marker of cortical amyloid deposition), total tau (t-tau, a marker of neurodegeneration intensity), and phospho-tau (p-tau, a marker of neurofibrillary pathological changes).
FCSRT-w and FCSRT-p results were correlated with CSF levels of β-A, t-tau and p-tau, as well as with t-tau/p-tau and t-tau/β-A ratios. A comparison between FCSRT and brain regional atrophy in T1-weighted images was then assessed using voxel-based morphometry by SPM software.

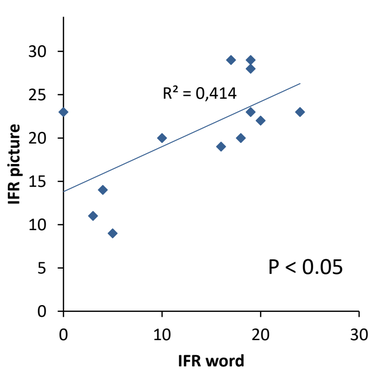
Immediate Free Recall (IFR)

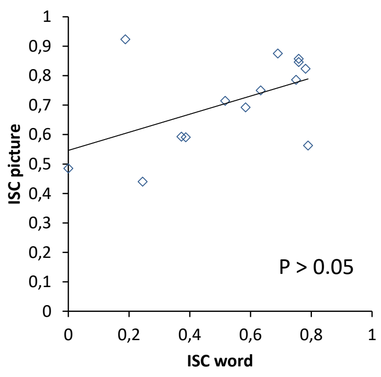
Immediate Total Recall (ITR)

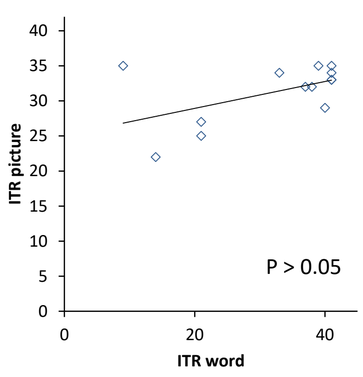
Index of Sensitivity of Cueing (ISC):

$$\frac{IFR - ITR}{IFR - punteggio\ massimo}$$

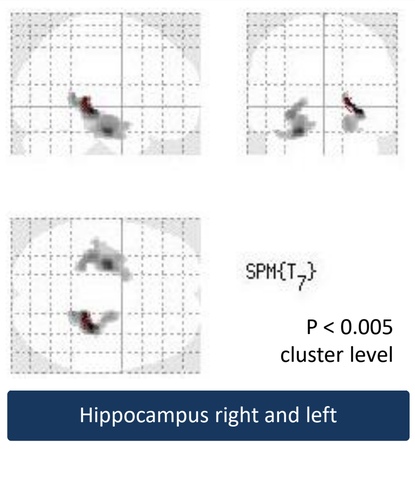




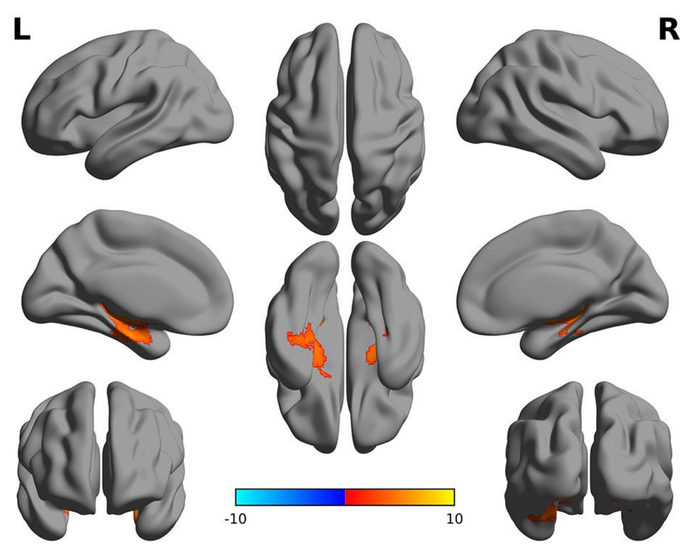




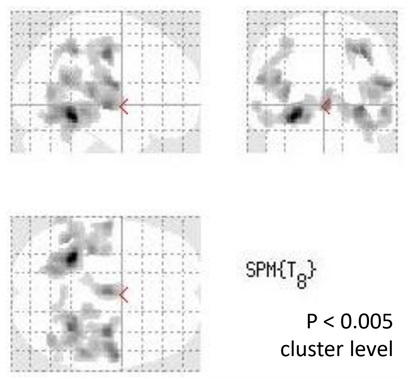
ISC-w → word



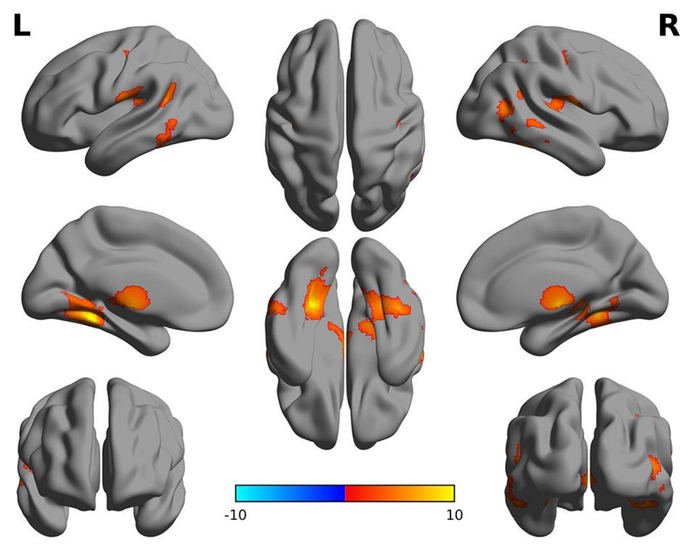
Hippocampus right and left



ISC-p → picture



Left fusiform gyrus (BA37)
Right peristriate visual area (BA19)



Results

We found a notable difference in the two FCSRT variants. A significant correlation was observed between β-A concentration in CSF and FCSRT-p, but not FCSRT-w. FCSRT-p was related with cortical atrophy in selected areas involved in processing of visual stimuli (left fusiform gyrus and right peristriate visual cortex). Conversely, FCSRT-w was significantly correlated to hippocampal atrophy.

Discussion

Our study suggested that FCSRT-w and FCSRT-p scores are not equivalent and can be used for different purposes. FCSRT-w may represent a topographical biomarker, identifying early alterations in hippocampal cortex. Conversely, FCSRT-p shows a lower reliability in identifying those brain areas that are primarily affected in AD. Nevertheless, FSCRT-p correlates with β-A concentration in CSF, and may be thus considered a pathophysiological biomarker of the disease.
Our preliminary results suggested that FCSRT-w and FCSRT-p are useful biomarkers in the early diagnosis of AD and to assess prognosis in MCI patients. A larger cohort of patients is needed to validate these results.

References

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3. Zimmerman ME et al. Comparison of "Word" vs. "Picture" Version of the Free and Cued Selective Reminding Test (FCSRT) in Older Adults. Alzheimers Dement (Amst) 2015;1(1):94–100.