ELSEVIER

Journal of the Neurological Sciences 248 (2006) 120 – 123

Journal of the Neurological Sciences

www.elsevier.com/locate/jns

Differences and similarities in the neuropsychological profile of dementia with Lewy bodies and Alzheimer's disease in the early stage

Marco Guidi *, Lucia Paciaroni, Susy Paolini, Silvia De Padova, Osvaldo Scarpino

Neurology Unit, Geriatric Hospital, INRCA, Via della montagnola, 81, 60100 Ancona, Italy

Available online 19 June 2006

Abstract

The literature concerning the neuropsychological profile of dementia with Lewy bodies (DLB) reports contrasting data even though a main impairment in attentional and visuospatial processes is mostly pointed out. In the present study, two selected groups, one of 12 DLB and the other of 12 Alzheimer's disease (AD) patients, both in the early stage of the disease, were matched for age, education and Mini Mental State Examination (MMSE). A comprehensive neuropsychological assessment and three scales to evaluate fluctuating cognition were administered. Significant differences were found between the two groups on attentional domain, memory, constructional and visuoperceptual abilities and fluctuation scales.

Keywords: DLB; AD; Memory; Attention; Neuropsychological features; Fluctuations

1. Introduction

DLB is considered the second cause of degenerative dementia, accounting for 15–20% of cases in hospital autopsy series [1].

Consensus guidelines for its clinical diagnosis contemplate a cortical dementia, fluctuations of cognitive performances, motor features of Parkinsonism and psychiatric symptoms. They consist, in the early stage of the disease, mostly in well-formed recurrent and persistent visual hallucinations.

Repeated falls, syncope, transient loss of consciousness, neuroleptic sensitivity, systematised delusions and REM sleep behaviour disorders [2,3] are also proposed as supportive features for a clinical diagnosis.

The DLB leading neuropathological finding consists of Lewy body formations, which are mostly localised in the cerebral cortex, brainstem nuclei (substantia nigra and locus coeruleus) and basal forebrain [4].

The DLB neuropsychological profile is based on different domain dysfunctions, especially attention, executive functions and visuoperceptual abilities [5]. Furthermore, an impairment of both semantic and phonemic verbal fluencies is described. AD patients show a more severe deficit in the first one. Deficit of semantic memory has been highlighted, especially for tasks that need a visuoperceptual access to semantic system [6]. Concerning episodic memory the DLB patients present, mainly in the early stage, better performances than AD [4]. Since the diagnosis of dementia is still principally based on the clinical frame, an accurate neuropsychological assessment, especially in the early stage of the disease, could be helpful to differentiate DLB from AD.

The aim of the present study was to find out differences and similarities in attentional, visuoconstructional and visuoperceptual functioning, semantic and episodic memory, by comparing two groups, both in the early stage of the disease, one composed of DLB and the other of AD patients, using a large neuropsychological battery of tests. Fluctuating cognitive performances have been also investigated using three fluctuation scales, based on reported information. The results make evidence of a DLB neuropsychological profile able, in some aspects, to differentiate patients affected by DLB from those affected by AD.

* Corresponding author. Tel.: +39 0718003521; fax: +39 0712801818.
E-mail address: m.guidi@inrca.it (M. Guidi).

0022-510X/$ - see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.jns.2006.05.017

2. Materials and methods

We selected two groups of patients in early stage of dementia: the first one of 12 patients affected by DLB according to McKeith criteria [2] and the other group of 12 patients affected by AD based on DSM IV criteria. The two groups were matched for age, education and dementia severity according to MMSE [7] (Table 1).

We excluded patients suspected of cerebral ischemic events, alcohol abuse, head injury, psychiatric disorders and other major physical illness, which could interfere with cognition.

2.1. Neuropsychological testing

2.1.1. Attention and executive functions

Attentional Matrices [8]: it explores visual selective attention. The patient is asked to search some target numbers in a sheet. We considered the number of right targets found in 45 s in the three matrices.

Stroop Test [9]: this test measures the interference effect that an automatic process can have on an effortful process. We considered the time effect and error effect.

Letter Fluency [10]: the patient is asked to generate as many words as possible beginning with the letter "S". We considered the numbers of correct words in 60 s.

Raven's Progressive Matrices (1947; *series A, B*) [11]: the bookform consists of 24 non-representational coloured designs incomplete in the bottom right end corner. The subject is given six alternatives, to select the one which best completes the patterns. We considered the total score.

2.1.2. Episodic memory

Rey Auditory Verbal Learning Test [12]: the patient is asked to learn a list of 15 words. Five trials are allowed. We considered the immediate recall, delayed recall (after 15 min without presentation) and recognition trial score.

Prose Memory Test [13]: it consists on listening to a short passage followed by an immediate recall; successively, the patient is presented the same passage and a recall is required after 10 min. We considered the different scores of these two trials.

2.1.3. Visuoconstructional abilities

Constructional Apraxia Test [8]: the patient is asked to copy seven geometrical figures. We considered the total score.

Table 1
DLB and AD groups matched by demographic details and MMSE scores

	AD	DLB	*t* test
Age	75.80	77.16	N.S.
Education	7.40	7.83	N.S.
MMSE	22.00	20.66	N.S.

2.1.4. Visuoperceptual abilities

Visual Object and Space Perception Test (*VOSP*) [14]: we used the following sub-tests: shape detection screening test, incomplete letters, silhouettes, object decision, dot counting, position discrimination, number location and cube analysis. We considered the total scores for each sub-test.

Mori's Test [15]: it consists of four groups of tests to examine visuoperceptual functions (discrimination of size, discrimination of form, overlapping figure identification, visual counting). We considered the total scores for each sub-test.

2.1.5. Language

Animal Naming (*semantic fluency*) [10]: the patient is asked to generate as many animal nouns as possible. We considered the number of correct words in 60 s.

Token Test (*oral comprehension*) [8]: it consists of 20 tokens with different colours and different geometrical shapes. The patient is asked to perform the command given by the examiner. We considered the total score.

Noun and Verb Naming (*ENPA*) [10]: it consists in 10 pictures of nouns and 10 pictures of verbs that the patient has to name. We considered the number of items rightly named for each sub-tests.

2.1.6. Fluctuation scales

Clinician Assessment of Fluctuation [16]: this is a short scale used by experienced clinicians regarding fluctuating, confusion and impaired consciousness during the month before the assessment. The information is gathered by a relative, who is asked to give a clear-cut example. We followed the scoring proposed by the authors, which ranges from 0 to 12.

One Day Fluctuation Assessment Scale: this scale focuses upon seven items of confusional behaviour (falls, fluctuation, drowsiness, attention, disorganised thinking, altered level of consciousness, communication) over the day before the assessment. We followed the scoring proposed by the authors with a range from 0 to 21.

Mayo Clinic Fluctuations Scale [17]: on the base of the suggestions from the authors, we used the four items significantly differentiating DLB from AD. The score range is from 0 to 4.

3. Statistical analysis

t test for independent samples was used in order to verify statistical differences between the two groups in all neuropsychological test scores.

The same statistical procedure was applied for testing the homogeneity of the groups for age, education and MMSE.

4. Results

Table 2 shows the statistically significant results in the comparison between the two groups of patients. We found