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Geriatric depression and its relation with cognitive impairment and dementia

Carol Dillon [a,c,*], María Florencia Tartaglini [b], Dorina Stefani [b], Pablo Salgado [a], Fernando E. Taragano [c], Ricardo F. Allegri [a]

[a] Memory Research Center, Department of Neurology, Hospital General Abel Zubizarreta (GCABA), Buenos Aires, Argentina
[b] Instituto de Investigaciones Cardiológicas "Prof. Dr. Alberto C. Taquini" (ININCA-UBA-CONICET), Argentina
[c] CEMIC University Institute (CONICET), Buenos Aires, Argentina

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ABSTRACT

Different subtypes of depressive syndromes exist in late life; many of them have cognitive impairment and sometimes it is difficult to differentiate them from dementia. This research aimed to investigate subtypes of geriatric depression associated with cognitive impairment, searched for differential variables and tried to propose a study model. A hundred and eighteen depressive patients and forty normal subjects matched by age and educational level were evaluated with an extensive neuropsychological battery, scales to evaluate neuropsychiatric symptoms and daily life activities (DLA). Depressive patients were classified in groups by SCAN 2.1: Major Depression Disorder (MDD) (n: 31), Dysthymia Disorder (DD) (n: 31), Subsyndromal Depression Disorder (SSD) (n: 29), Depression due to Dementia (n: 27) (DdD). Neuropsychological significant differences ($p < 0.05$) were observed between depressive groups, demonstrating distinctive cognitive profiles. Moreover, significant differences ($p < 0.05$) were found in DLA between DdD vs all groups and MDD vs controls and vs SSD. Age of onset varied in the different subtypes of depression. Beck Depression Inventory (BDI) and Mini Mental State Examination (MMSE) were significant variables that helped to differentiate depressive groups. Significant correlations between BDI and Neuropsychological tests were found in MDD and DD groups. Depressive symptoms and its relation with neuropsychological variables, MMSE, cognitive profiles, DLA and age of onset of depression should be taken into consideration for the study of subtypes of geriatric depression.

1. Introduction

Depression and cognitive impairment are among the most important mental health problems in elderly people (Dillon et al., 2013; Solhaug, Romuld, Romild, & Stordal, 2012; Zhao et al., 2012). Both conditions have severe consequences for the patients, including diminished quality of life, functional decline, increased use of services, and high mortality (Macdonald, 1997). Furthermore, these diseases impact health of caregivers. The World Health Organization (2008) considers the care of these pathologies a risk factor for the development of mental disorders and burden.

Late onset depression and cognitive impairment often occur together, suggesting a close association between them (Migliorelli et al., 1995; Zubenko et al., 2003). It is not known, however, whether depression leads to cognitive decline or vice versa (Jorn, 2001; Schweitzer, Tuckwell, O'Brien, & Ames, 2012).

The literature on the interplay of depression and dementia has always reported contradictory results. Three main hypotheses to explain the association were formulated: (1) depression may be considered a psychological reaction to eroding cognitive capacities early in the course of dementia. (2) A common underlying central nervous system disorder may cause depression as well as cognitive decline in elderly persons: it has been shown that elderly depressed people have more frequent and more severe white matter and other subcortical abnormalities on brain magnetic resonant images. (3) Depression may be associated with high levels of cortisol, which may lead to neuronal death and dysregulation of the hypothalamic-pituitary-adrenal axis with, as a consequence, hippocampal atrophy and cognitive decline (Bagulho, 2002).

* Corresponding author at: CEMIC University Institute, Av E. Galvan 4102, 1431 Buenos Aires, Argentina. Tel.: +54 11 52990372; fax: +54 11 52990372.
E-mail addresses: drcaroldillon@yahoo.com.ar, siren@cemic.edu.ar (C. Dillon).

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Depression is one of the most studied symptom in mild cognitive impairment (MCI) and dementia. There is a high prevalence of depressive symptoms in vascular dementia (31.4%) and in dementia of Alzheimer's type (DAT) (19.8%) when compared with the cognitively normal elderly (13.2%) (Barca, Knut, Lacks, & Selback, 2012). Depressive symptoms are often present during early stages of dementia (Dillon et al., 2013), due to this sometimes it is difficult to differentiate them with elderly patients with Major Depression (Barca et al., 2012).

Late-life depression, defined as a major depressive episode occurring in older adults (usually after the age of 65 years), is a heterogeneous mood disorder frequently associated with cognitive impairment. Late-life depression encompasses both late onset cases as well as early onset cases that recur or continue into later years of life. The temporal association between cognitive and depressive symptoms in elderly patients varies widely, yet evidence suggests that depressive illness contributes to the development of persistent or progressive cognitive deficits in some individuals (Butters et al., 2008).

Butters et al. (2008), propose that depression alters an individual's risk of cognitive dysfunction, shortening the latent period between the development of Alzheimer's disease (AD) neuropathology and the onset of clinical dementia, thus increasing the incidence and prevalence of AD among older adults with depression.

In our recent study about different subtypes of geriatric depression (MDD, DD, SSD and DdD of Alzheimer type) we found clinical and neuropsychological variables that are useful for differential diagnosis (Dillon et al., 2011).

This research aimed to analyze these depressive subtypes (MDD, DD, SSD, DdD), which are associated with cognitive impairment in geriatric patients, and tried to propose a study model.

2. Materials and methods

A cross-sectional analytical study was performed. The study took place in a Memory Clinic from a Buenos Aires community-based outpatient hospital, the Hospital General Zubizarreta (public health system).

Following this previous study, different variables associated to Geriatric Depression were studied in this investigation such as psychiatric symptoms, level of depression, cognitive variables, DLA and age of onset of depression (late onset depression-depressive symptoms that began over 65 years of age-, early onset depression-depressive symptoms that began under the age of 65 years–). In addition, we analyzed which variables had more weight to differentiate depressive groups.

2.1. Study population

A total of 118 depressive patients with cognitive complaints and 40 controls (those lacking signs and symptoms of depression or cognitive impairment) from the general population, matched by age and educational level (age 63 ± 8.28 years, educational level 9.8 ± 4.3 years), were recruited.

2.2. Inclusion criteria

Included in the study were patients who consulted or were referred to our Memory Clinic, presenting depressive symptoms that were due to psychiatric causes or were related to with mild DAT (CDR 1: mild dementia; CDR: Clinical Dementia Rating Scale), who were more than 55 years old but less than 80 years old, and with a Hamilton Depression Scale rating >9 points and BDI >9.

2.3. Exclusion criteria

Patients with drug or alcohol abuse, with moderate or severe dementia by the CDR (2 = moderate dementia or 3 = severe dementia), and with schizophrenia or schizoaffective disorder were excluded from the study.

2.4. Screening procedure

Depressive patients were divided into four different groups according to DSM IV (APA, 1994) and ICD 10 (1990) criteria with the SCAN 2.1 (WHO: World Health Organization, Wing et al., 1990) schedules for clinical assessment in neuropsychiatry.

SCAN is a set of instruments and manuals aimed at assessing, measuring, and classifying psychopathology and behavior associated with the major psychiatric disorders in adult life. It can be used for clinical, research, and training purposes, and was developed within the WHO framework. SCAN has a bottom-up approach where no diagnosis-driven frames are applied in grouping the symptoms. Each symptom is assessed in its own right. SCAN has a proven stability. The method used is that of a semi-structured standardized clinical interview, with cross-examination of the subject. Rating is done on the basis of matching the answers of the respondent against the definitions of the symptoms in the Glossary, which is an integral part of SCAN. All the symptoms and signs and classification items are defined in this Glossary, which is largely based on the phenomenology of Jaspers. With SCAN the interviewer decides what to rate on the basis of the subject's information, always bearing in mind the definitions and rating rules (Wing et al., 1990).

The study participants were grouped as follows:

Group 1: MDD (*n*: 31);
Group 2: DD (*n*: 31);
Group 3: SSD (*n*: 29);
Group 4: DdD: only mild Alzheimer dementia; CDR 1 (CDR Scale) were recruited (*n*: 27);
Group 5: Controls (C) (*n*: 40).
Screen failures: 12 patients, 5 controls.

All of the recruited patients were assessed using a semi-structured neuropsychiatric interview. Different psychiatric scales were used, including the Beck Depression Scale, the Hamilton Depression Scale, and the Hamilton Anxiety Scale.

Patients and normal controls were matched by age, education, and overall cognitive status using the MMSE (Folstein, Folstein, & McHugh, 1975).

Each patient underwent an extensive neuropsychological battery to evaluate the following areas of cognitive ability:

Orientation: MMSE (Folstein et al., 1975).
Attention: Digit span (forward and backward) (Wechsler, 1988); Trail making test "A" (Reitan, 1958).
Language: Boston naming test (BNT) (local version adapted by Allegri, Mangone, Rymberg, Fernandez, & Taragano, 1997), Semantic fluency (SF) (Benton, Hannay, Varney, & Spreen, 1983), Verbal fluency (VF) (Benton et al., 1983).
Memory: Signoret memory battery (Signoret & Whiteley, 1979): episodic memory (immediate logic memory (ILM), delayed logic memory (DLM); verbal serial learning (VSL), delayed serial memory (DSM), cued recall (CR), recognition (Recog).
Visuospatial abilities: Clock drawing test (Freedman et al., 1994).