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Geriatric Depression and Cognitive Impairment: A Follow up Study

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Abstract

Introduction: Depression in older adults has become a major problem for public health. A high percentage of this population is under-diagnosed in primary care.

The objectives of this work were firstly, to investigate the causes, risk factors, cognitive profile, functional status and quality of life of patients with geriatric depression, and secondly, to make a follow up of these patients.

Materials and methods: Patients who consulted for memory problems associated with depression were recruited during the years 2005-2007. A semi-structured neuropsychiatric interview, an extensive neuropsychological battery, and complementary studies were performed.

Results: One hundred and one depressive patients and 25 normal controls were evaluated. There was a significant prevalence and incidence of depression in the geriatric population. Significant differences ($p<0.05$) were found between depressive patients and controls in dyslipidemia, heart disease, cerebrovascular disease, inadequate family support, family history of depression and inactivity (OR 6.5). A global cognitive impairment was frequently associated with depression. Depression caused an alteration in functional status. Follow up results: From the 101 patients evaluated only 61 attended to the follow up visit (61.4%). All patients were indicated antidepressant treatment. Of these, only 36 patients continue with the treatment indicated in the baseline visit. Of the patients who were in antidepressant treatment (n=36) 46.6% had an excellent to good response, and 13.3% had a response from fair to poor. The main causes of poor response were adverse effects, low-dose and treatment neglect. Of the reevaluated patients, 56.6% improved in cognition or mood. The greatest improvement was observed in depression and anxiety affective symptoms. Within the cognitive profile, memory and attention trend to improve with medical treatment.

Conclusion: Depression is a prevalent disease in the elderly population. It is important to implement health policies to inform the community, prevent associated risk factors, and promote appropriate treatments and rehabilitation. This condition not only affects the patient but also their environment.

Keywords: Depression; Geriatrics; Risk factors; Cognitive impairment-treatment; Follow up

Abbreviations

ADL: Activity of Daily Living Scale; BNT: Boston Naming Test; BSRT: Buschke Selective Reminding Test; CDR: Clinical Dementia Rating Scale; CR: Cued Recall; CT: Computed Tomography; CVD: Cerebrovascular Disease; DLM: Delay Logic Memory; DSM IV: Diagnostic and Statistical Manual of Mental Disorders IV; DSM: Delay Serial Memory; HBP: High Blood Pressure; HCL: High Cholesterol Level; ICD: International Codification of Diseases; ILM: Immediate Logic Memory; IQ: Intelligence Quotient; MMSE: Mini-Mental State Examination; MRI: Magnetic Resonance Imaging; SCAN 2.1: Schedules for Clinical Assessment in Neuropsychiatry; SF: Semantic Fluency; SSRI: Selective Serotonin Reuptake Inhibitor; TMA: Trail Making Test A; TMB: Trail Making Test B; VF: Verbal Fluency; VSL: Verbal Serial Learning

Introduction

More than 350 million people are affected by depression making it one of the most common disorders in the world. It is the biggest cause of disability, and as many as two-thirds of those who commit suicide have the condition. But although depression is common, it is often ignored [1].

Depression in older adults is a very common condition that creates a major problem for public health [2]. A high percentage of this population is under-diagnosed in primary care [3].

It has been demonstrated that depression is associated with cognitive impairment due to vascular factors [4], degenerative process [5], or emotional compromise. Moreover, it could be also related with social and psychological distress situations [6,7], or co-morbid clinical diseases (chronic diseases, cancer, neurological diseases, etc.) [8,9].

It is frequently under-diagnosed in clinical practice, mostly in those patients with late onset geriatric depression that develop subsyndromal

depressive symptoms where memory and other cognitive functions are mildly impaired [10,11]. These patients minimize their symptoms thinking that it is normal to have them due to their social problems or their co-morbid diseases. These factors attempt against an effective treatment for depressive syndromes and probably these symptoms will last for months or even years without a proper treatment.

The objectives of this work were firstly, to investigate the causes, risk factors, cognitive profile, functional status and quality of life of patients with geriatric depression, and secondly, to make a follow up of these patients.

Materials and Methods

Patients who consulted for memory problems associated with depression to a memory clinic from a public (Memory Research Center, Zubizarreta Hospital) and a private Hospital (SIREN-CEMIC University Hospital) were recruited during the years 2005-2007. A semi-structured neuropsychiatric interview and an extensive neuropsychological battery with complementary studies were performed.

Inclusion criteria

Patients who present depressive symptoms due to psychiatric causes or are related to dementia (clinical dementia rating scale 1-CDR). Patients more than 55 years and less than 80 years old. Patients with Hamilton depression scale more than 9 points and Beck depression inventory more than 9 points.

Exclusion criteria

Patients with schizophrenia or schizoaffective disorder. Patients with Hamilton depression scale less than 10 points and Beck depression inventory less than 10 points. Patients less than 55 years old. History of drug or alcohol abuse. Moderate or severe dementia (CDR 2, or CDR 3).

All patients were assessed using a semi-structured neuropsychiatric interview (administered by specialized psychiatrists and neurologists). Depressive syndromes were categorized into different diagnoses according to the diagnostic and statistical manual of mental disorders (DSM IV) and international codification of diseases (ICD 10) criteria, using schedules for clinical assessment in neuropsychiatry (SCAN 2.1) [12,13].

Other psychiatric scales were performed including Hamilton depression scale and Beck depression inventory to evaluate level of depression, and Hamilton anxiety scale to determine level of anxiety [14-16]. Also, neuropsychiatric inventory (NPI) was administered to the patient's caregivers in order to collect more data from the patients´ behavior [17].

Patients and normal controls were matched by age, education and overall cognitive status using the mini-mental state examination (MMSE) and the clinical dementia rating (CDR) instrument. CDR was administered as a severity rating scale [18,19].

We assessed vascular risk factors and co-morbidities such as high blood pressure (HBP), high cholesterol level (HCL), heavy smoking, cerebrovascular disease (CVD), and heart diseases. Additionally, we evaluated sociological risk factors of depression, such as marital status (couple or single, single patients being those who live alone or have no emotional support), and level of activity (active: currently working or else engaged in physical, cognitive, social or recreational activities, or passive: not working and without activities). In order to investigate the different cognitive profiles, each patient underwent an extensive neuropsychological battery to evaluate the following areas of cognitive ability:

- Orientation: MMSE
- Attention: Digit span (forward and backward); Trail making test "A" [20,21].
- Language: Boston naming test (BNT) [22]; vocabulary; semantic fluency (SF) [23]; verbal intellectual quotient (IQ) [24]; verbal fluency (VF) [23].
- Memory: Signoret memory battery; episodic memory: immediate logic memory (ILM), delayed logic memory (DLM); verbal serial learning (VSL), delayed serial memory (DSM), cued recall (CR), recognition (Recog) [25]. Buschke selective reminding test, free recall (BSRT fr); Buschke selective reminding test, cued recall (BSRT cr) [26].
- Abstraction and reasoning: Similarities and matrix reasoning [24].
- Visuospatial abilities: Block design; clock-drawing test [24,27].
- Executive functions: Trail making test "B"; VF [21,23]
- IQ: Wechsler abbreviated scale of intelligence (Weschler) [24]
- Lawton and Brody activities of daily living scale [28].

Laboratory Analysis Were Done

Neuroimaging

Computed tomography scan (CT) or magnetic resonance imaging (MRI) were done in patients with neurological symptoms.

Written informed consent was obtained from each subject after they had been given a full explanation of the study. The research was performed in accordance with the International Conference of Harmonization Good Clinical Practice guidelines, the latest revision of the 1964 Helsinki Declaration, and the Buenos Aires Government Health Authorities regulations [29].

Follow up

After recruiting and evaluating the depressive patients and normal controls at baseline, we indicated antidepressant treatment (SSRI´s type: sertraline 25-50 mg per day or escitalopram 10 mg per day). Follow-up visits were performed after at least 6 months of treatment.

Data analysis

Statistical Package SSPS 15.1 was used to analyze data. Demographic variables for both populations (patients and controls) as well as the results of neuropsychiatric and neuropsychological general global tests were expressed as means, standard deviation and medians.

Quantitative variables were compared using Student T test for different groups (independent samples) and Student T test (related samples) for the comparison of the follow up of a group. The relationship between qualitative variables was compared by the chi-squared test. Predictive factors for depression were analyzed using the odds ratio (OR) with 95% confidence intervals (95% CI).

Results

Demographic data

A hundred and one depressive patients and 25 normal controls were evaluated. There was a significant prevalence and incidence of depression in the geriatric population. See demographic data in Table 1.

	Patients (n=01)	Controls (n=25)
Age	66.7 (8.9)	64.4 (6.8)
Educational level	8.73 (4.4)	11.7 (4.1)
Gender (male/female)	22/79	10/15
Activity level (active/passive)	39/62	20/5
Marital status (couple/single)	58/43	21/4

Table 1: Demographic data.

Diagnosis of Depression Mood Disorder

In the study population, 36 patients with mayor depression and 34 patients with dysthymia were diagnosed. From the patients with Major Depressive Disorder, 7 had bipolar disorder. Of the patients with Depression due to Medical Conditions: 10 had Vascular Dementia, 10 Alzheimer's type Dementia and 6 Frontotemporal type Dementia; all of them were CDR 1 (mild dementia) (Table 2).

Diagnosis	Number of Patients
Major depressive Disorder	36
Dysthymia Disorder	34
Depression due to Medical Condition	26
Unspecified Mood Disorder	5

Table 2: Depression mood disorder. Diagnosis according to DSM IV criteria.

Neurological examination

The results of the neurological examination are depicted in Table 3.

Piramidalism	24
Extrapiramidalism	15
Archaic reflex	26
Cerebellar manifestations	1
Gait apraxia	2
Abnormal neurological examination	45

Table 3: Clinical findings in neurological examination.

Laboratory

Media and standard deviation of the following tests were evaluated: Hematocrit, eritrosedimentation, glycemia, cholesterol, THS, B12 vitamin, folic acid. Findings showed in Table 4.

	Mean (S.D.)	Range
Hematocrit	39.5 (+/- 3.6)	29-51
Erythrocyte sedimentation rate	18.0 (+/-13.1)	Feb-63
Glycemia	98.20 (+/-28.5)	73-244
Cholesterol	219 (+/-40.6)	150-327
TSH	2.30(+/-1.99)	11.2-0.4
B12 vitamin	512.8 (+/-422)	106-2000
Folic acid	10.3 (+/- 4.35)	3.5-24

Table 4: Laboratory tests.

Neuroimaging results are resumed in Table 5.

Normal	Vascular disease	Atrophy	Atrophy + vascular disease
19 patients	15 patients	25 patients	19 patients

Table 5: Brain neuroimaging.

Risk Factors

Significant differences ($p<0.05$) in dyslipidemia, heart disease, cerebrovascular disease, inadequate family support, family history of depression and passive patients were found compared to normal controls. It was demonstrated that inactivity produces a relative risk of 6.5 of developing depression (Tables 6 and 7).

Hypertension

We observed that 48 patients (47.5% of the study population) have diagnosed and treated hypertension. It was also noted that 13 patients had systolic blood pressure greater than 140 and diastolic blood pressure greater than 95; 5 of these patients were not diagnosed as hypertensive (12.8% of the study population).

Diabetes

It was found that 11.1% of patients had DBT type 2. Of these, 5.5% had glycemic control beyond the upper normal limit (greater than 110 mg/dl).

Dyslipidemia

45.5% of patients had high cholesterol levels, from them 46.6% had values more than 200 mg/dl. The average cholesterol level for all patients was higher than accepted normal values (230 mg/dl).

Psychiatric history

53 patients had a depressive episode before 60 years old and 48 patients had depressive episodes after that age. Total population was divided in two groups: late onset depression and early onset depression. The late onset depression patients were defined as those who had a depressive episode after they were 60 years old [30].

Antidepressant treatment: 43 patients had never taken antidepressant until baseline visit

Psychiatric hospitalisations: 4 patients

Suicide attempt: 5 patients

Electroconvulsive therapy: 1 patient

Variables	Depression (N=101)	Control group (N=25)	P	Estimate Risk (Confidence interval)
Hypertension	46	7	NS	
Diabetes	46	7	NS	
Dyslipidemia		5	0.02	3.3(1.16-9.6)
Cardiac disease	29	2	0.033	4.5 (1.01-20.6)
Thyroid disease	21	2	NS	
Stroke	13	1	NS	
Cerebrovascular disease	25	1	0.016	8.5(1.1-66.7)
Cigarette smoking	29	8	NS	
Other illness	65	15	NS	

Table 6: Medical risk factors.

Family history

In the depressive group there were 52 patients with family psychiatric history, being the most frequent conditions depression and dementia. On the other hand, there were 11 individuals in the control group with family psychiatric history. When we evaluated the Depressive group there were 33 relatives with depression history and only 3 in the control group.

Variables	Depressive group (N=101)	Control group (N=25)	P	Estimated risk (CI)
Currently working	62	5	<0.001	6.5 (2.26-18.8)
Family support	35	4	0.035	3.2 (1.04-10.35)
Family depression history	33	3	0.038	3.6 (1.01-12.9)
Civil status	58	21	NS	0

Table 7: Psychiatric and Sociologic risk factors in 101 patients and 25 normal individuals.

Medications

Only four controls (16%) take three drugs within which there are preventive medications such as aspirine. Ten controls take between 1-2 medications and nine controls (36%) do not take any medication (Table 8).

Number of pharmacological agents	Depressive patients N=100	Control group N=23
One (1)	4	9
Two (2)	11	7
Thee (3)	20	3
Four (4)	25	4
Five (5)	13	0
Six (6)	9	0
Seven (7)	13	0
Eight (8)	4	0

Table 8: Daily medication, comparison of depressed patients (N: 100) with normal controls (n=23).

Neuropsychological variables

Cognitive profile. A global cognitive impairment (the majority having subcortical profile) was associated with depression (Table 9).

Activities of daily living

We used an activity of daily living scale (ADL). It was filled by the patient and a relative. The objective was to compare the information provided by both of them. Each item was value in three ways: 0: independent; 1: partial dependence; 2: total dependence. The ADL total mean informed by patients was 1.36 (S.D. 2.4) rank between 0-14; the ADL total mean informed by relatives was 2.04 (S.D. 2.64) rank 0-9 (Table 10).

	Depressive Mean (SD)	Controls Mean (SD)	P
Paragraph recall	4.66 ± 2.43	7.91 ± 1.8	0.0001**
Paragraph delay recall,	4.27 ± 2.5	7.56 ± 2.0	0.0001**
List of words	7 ± 2.44	9.76 ± 1.6	0.0001**
Retention	4.9 ± 3.1	8.41 ± 1.9	0.0001**
Recall with clues	7.8 ± 3.4	11.2 ± 0.92	0.0001**
Recognition	10.4 ± 1.9	11.7 ± 0.42	0.035*
BSRT	6.1 ± 2.1	7.47 ± 1.18	0.005*
BSRTfr	6.8 ± 1.5	7.6 ± 1.05	0.013*
Boston Naming test	44.2 ± 8.6	52.9 ± 4.0	0.001*
Semantic fluency	13.6 ± 5.1	20.1 ± 4.7	0.0001**
Phonological fluency	11.3 ± 5.5	15.4 ± 3.4	0.0001**
TMA	72.6 ± 48	50.8 ±18	0.001*
Digit Span forward	5.1 ± 1.2	6.1 ± 1.0	0.002*
Digit Span backward	3.7 ± 1.07	4.59 ± 1.3	0.004*
TMB	239 ± 165	115± 43	0.009*
Clock drawing test	5.26 ± 2.3	6.6 ± 0.6	0.045*
References: BSRT: Buschke Selective Reminding Test, free recall; Buschke Selective Reminding Test, free recall (BSRT fr); TMA; Trail Making test A; TMB: Trail making test B			

Table 9: Neuropsychological tests. Depressive (baseline) vs normal controls.

ADL inventory	Mild depression	Moderate depression	Severe depression
Patient, mean	0.5 (0-9)	1 (0-6)	1.68 (0-14)
Relative, mean	1.25 (0-7)	1.68 (0-9)	2.05 (0-8)

Table 10: Activities of daily living.

Follow-up results

Thirty nine patients (38.6%) were contacted but did not attend the follow-up visits, and sixty one patients were evaluated (61.4%) and followed-up. In this last group, only thirty six patients continue with the antidepressant treatment indicated at the baseline visit.

Of the patients who were in antidepressant treatment (n=36) 46.6% said they had a response from excellent to good to antidepressant treatment, and 13.3% had a response from fair to poor. Of all patients in follow-up (n=61) 41.6% received prior antidepressant treatment. From these, 28% said to have responded well to previous antidepressant treatment, and 72% had a fair to poor response. The main causes of poor response were adverse effects, low-dose and treatment neglect.

Of the reevaluated patients, 56.6% improved in any area either cognitive or mood. Improvement was described in the mood (anxiety and depression) and into cognitive functions (memory, attention, executive functions and language) (Table 11). The greatest improvement was observed in depression and anxiety affective spheres. Within the cognitive profile, memory was the most improved function, and, secondly, attention (Tables 12 and 13).

Variables	Improved	No changes	Decreased
Anxiety/Depression	31	11	19
Memory	18	13	11
Attention	14	15	10
Executive functions	5	20	11
Language	4	21	6

Table 11: Follow-up. Patient's response to antidepressant treatment.

Variable	Baseline N=101	Follow up N=61	P
Hamilton Anxiety Scale	17.5 ± 8	10.2 ± 8.1	<0.001
Hamilton Depression Scale	18.1 ± 6	11.6 ± 8.3	<0.001
Beck Depression Inventory	22.7 ± 10	17.5 ± 12	0.009

Table 12: Neuropsychiatric test. Depressive patients at baseline compared to follow up visit.

Discussion

With the results obtained in this research we arrived to the following conclusions:

Demographic data

There was a significant predominance of female patients, 79.7% of the studied population. Prospective studies reveal more incidence of major depression among women compared to men [31,32], this could be considered as a predisposing factor for the development of the disease. From the observed population, 58.5% is married; the rest is divorced, widowed, single or separate. Widowhood, singleness and separation or divorce are risk factors for developing depression [33-36]. With regard to educational level average in our patients is about 8.73 (SD 4.4) years, where most of the patients completed primary school. Low education is a risk factor for depression [32].

Diagnosis of depression mood disorder

In this study population, they were found in decreasing order 36.3% of patients with major depression (according to DSM-IV and ICD-10), and 34.3% of patients with dysthymia (according to DSM IV and ICD-10. From the patients with Major Depressive Disorder, 7 of them had bipolar disorder. Of the patients with Depression due to Medical Conditions (n=26, 25.7%): 10 had Vascular Dementia, 10 Alzheimer's type Dementia and 6 Frontotemporal type Dementia. All of them were scored CDR 1 (mild dementia).

In the geriatric population, it could be considered that neurological diseases, such as vascular and degenerative dementia, become important in the development of depression as it has been described in previous work [37].

	Baseline N=101 Mean (SD)	Follow-up N=61 Mean (SD)	P
MMSE	26.2 ± 3.2	26.1 ± 3.7	NS
Pfeiffer	1.22 ± 1.3	1.52 ± 1.2	NS
Paragraph recall	4.66 ± 2.43	5.2 ± 2.9	NS
Paragraph delay recall	4.27 ± 2.5	4.84 ± 2.9	NS
List of words	7 ± 2.44	7.1 ± 2.45	NS
Retention	4.9 ± 3.1	5.3 ± 3.1	NS
Recall with clues	7.8 ± 3.4	8.2 ± 3.3	NS
Recognition	10.4 ± 1.9	10.2 ± 2.5	NS
BSRT	6.1 ± 2.1	5.79 ± 2.7	NS
BSRTfr	6.8 ± 1.5	6.6 ± 1.7	NS
Boston Naming test	44.2 ± 8.6	43.9 ± 8.9	NS
Semantic fluency	13.6 ± 5.1	14.8 ± 6.8	NS
Phonological fluency	11.3 ± 5.5	11.1 ± 5.3	NS
TMA	72.6 ± 48	93.9 ± 76	NS
Digit Span forward	5.1 ± 1.2	5.1 ± 1.2	NS
Digit Span backward	3.7 ± 1.07	3.5 ± 0.9	NS
TMB	239 ± 165	293 ± 181	NS
Clock drawing test	5.26 ± 2.3	5.26 ± 2.3	NS

References: MMSE: Minimental State Examination; BSRT: Buschke Selective Reminding Test, free recall; Buschke Selective Reminding Test, free recall (BSRT fr); TMA; Trail Making test A; TMB: Trail making test B

Table 13: Neuropsychological Tests. Depressive patients at baseline compared to follow-up.

Risk factors

In the present study we considered medical, psychiatric and sociological risk factors.

There is an assumption of executive dysfunction in late-onset depression [30,38,39]. This hypothesis suggests that a subgroup of elderly people with depression, with fronto-striatal dysfunction caused by cerebrovascular disease or other age-related conditions, would be the main predisposing factor for depression [30].

In previous studies depression was associated with concomitant diseases [34], previous personality, altered functional status [33], alcohol abuse [40], hypothyroidism and lack of family support.

Of the evaluated risk factors (including both vascular and depression themselves) no significant differences ($p < 0.05$) were found compared to normal controls in variables as HTA, DBT, smoking, alcohol consumption, concomitant diseases, and marital status. On the other hand, significant differences were found ($p < 0.05$) in patients with dyslipidemia (OR 3.3, CI 1.16-9.6), heart disease (OR 4.4, CI 1.01-20.6), cerebrovascular disease (OR 8.5, CI 1.1-66.7), currently active or working (OR 6.5, CI 2.26-18.8), inadequate family support (OR 3.2, CI 1.04-10.35), and family history of depression (OR 3.6, CI 1.01-12.9). Yaka et al. reported that the following variables were risk factors for depression: obstructive pulmonary disease, psychiatric disease, cerebrovascular disease, low income and being dependent [41]. Moreover, a meta-analysis showed that, compared with the elderly without chronic disease, those with chronic disease had higher risk for depression [42]. The lack of activity or work produces a relative risk of 6.5 of developing depression.

Cognitive functions

Depression is a mental illness that affects not only psychologically (mood disorder) but also cognitively (through cognitive impairment) [43,44]. Depression in older patients could be an expression of neuronal degeneration and initial symptom of a dementia [44]. This should be considered in any patient that begins his/her depression after he/she is 60 years old (late-onset depression).

Daily life activities

It was observed that, in general, patients had some degree of dependence (partial dependence) in activities of daily living. This certainly increases the overload (the average overload found in our sample was mild to moderate). It was noted that increase degrees of depression increases the patient's dependence.

Depression causes a reduction in the active life of 4 years [45]. Depression causes an alteration in the functional status of people, damaging both the quality of life of patients and their environment (family overload) [46].

As the degree of depression increases, the dependence of the patient and family overload also increase. All this leads to generate significant health expenditures increasing costs associated with this disease [47].

Antidepressant treatment

47.7% of depressive patients included in this work were without antidepressant treatment at baseline visit. This shows the lack of information received by general population about this disease, and hence the low demand for medical care.

Recurrence and relapse

54.4% of evaluated patients (41 patients) had recurrence and/or recurrence of their depressive symptoms throughout their lives.

Follow-up

We recruited 101 depressive patients and 25 normal controls at baseline, then proceeded to see the evolution of these depressive patients who spent at least 6 months after their first visit.

We contacted all patients but only 61 of them could be reevaluated, (60.4%). Remaining patients were summoned for missing evaluations (at least cited twice). Of contacted and reassessed patients only 60% receive antidepressant treatment, despite the indication of treatment to all patients enrolled in 2005-2006.

Of the patients who are in antidepressant treatment (n=36) 46.6% said they had an excellent to good response to antidepressant, and 13.3% had a response from fair to poor. Of all patients in follow-up (n=61) 41.6% received prior antidepressant treatment. They responded excellent to good to previous antidepressant treatment in 28% of cases, and fair to poor in 72%. The main cause of fair to poor response was adverse effects, low-dose and treatment neglect.

Of the reevaluated patients 56.6% improved in any area, either cognitive or mood. The greatest improvement was observed in depression and anxiety affective spheres. Within the cognitive profile, memory was the most improved function, and, secondly, attention.

Statistically analysis (Student test for related samples) of results obtained in the different neuropsychiatric and neuropsychological scales, informed significant differences ($p<0.05$) in neuropsychiatric scales between the initial assessment and reassessment (Hamilton anxiety scale, Hamilton depression and Beck depression).

As it had been reported in other studies, the present work shows that there is a predominance of women in the depression patients group [31,48] and a high percentage of depressed patients without any social support [41,49].

An important prevalence and incidence of depression in the elderly population was observed. Nevertheless, a high percentage of patients do not receive or never received antidepressant treatment as it was reported previously [50]. However, after receiving treatment, our patients underwent an improvement in their affective state (anxiety, depression).

Limitations

The following study is an epidemiological and case-control research study with follow-up. It is not a randomized controlled trial. The data obtained is descriptive and shows a trend that cannot be taken in consideration as an specific response to a singular antidepressant treatment. Moreover, the antidepressant treatment indicated had two different medications [sertraline (25-50 mg/day) and escitalopram (10 mg/day)]. No reference to other medications is described in this research, as it is out of the aims of the study. Also, patients at follow-up were not divided in groups, all depressive patients were in a single group; this can lead to certain bias in the results as patients with dementia will not beneficiate as well as major depressive or dysthymia patients. Therefore, when analyzing the results of the improvement of the neuropsychological tests in the follow up visit, this should be taken into consideration.

Conclusions

Depression is a prevalent disease in the elder population. It is important to implement health policies to inform the community, prevent associated risk factors, and promote appropriate treatments and rehabilitation. This condition not only affects the patients but also their environment.

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References

1. Ledford H (2014) Medical Research: if depression were cancer. Nature 515:182-184.
2. Luppa M, Sikorski C, Luck T, Ehreke L, Konnopka A, et al. (2012) Age- and gender-specific prevalence of depression in latest-life--systematic review and metaanalysis. J Affect Disord 136: 212-221.
3. Unutzer J (2007) Clinical practice. Late-life depression. N Engl J Med 357: 2269-2276.
4. Alexopoulos G, Meyers B, Young R, Campbell S, Silbersweig D, et al. (1997) 'Vascular Depression' Hypothesis. Arch Gen Psychiatry 54: 915-922.
5. Dillon C, Allegri R, Serrano C, Iturry M, Salgado P, et al. (2009) Late- versus early-onset geriatric depression in a memory research center. Neuropsychiatr Dis Treat 5: 517-526.
6. Hammen C (2005) Stress and Depression. Annual Review of Clinical Psychology 1: 293 -319.
7. Wilson K, Chen R, Taylor S, McCracken C, Copeland J (1999) Socioeconomic deprivation and the prevalence and prediction of depression in older community residents. Br J Psychiatry 175: 549-553.
8. Alexopoulos G, Buckwalter K, Olin J, Martinez R, Wainscott C, et al. (2002) Comorbidity of late-life depression: an opportunity for research in mechanisms and treatment. Biol Psychiatry 52: 543–558.
9. Carney R, Freedland K (2003) Depression, mortality, and medical morbidity in patients with coronary heart disease. Biol Psychiatry 54: 241–247.
10. Hybels C, Blazer D (2003) Epidemiology of late-life mental disorders. Clin Geriatr Med 19: 663-696.
11. Taylor W (2014) Clinical practice. Depression in the elderly. N Engl J Med 371: 1228-1236.
12. American Psychiatric Association (1994) Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. American Psychiatric Association, Washington, USA.
13. International Classification of Diseases (ICD) (2010) World Health Organization.
14. Hamilton M (1980) Rating depressive patients. Journal of Clinical Psychiatry 41: 21-24.
15. Beck A, Ward C, Mendelson M, Mock J, Erbaugh J (1961) An inventory for measuring depression. Arch Gen Psychiatry 4: 561–571.
16. Hamilton M (1959) The assessment of anxiety states by rating. Br J Med Psychol 32: 50–55.
17. Cummings J, Mega M, Gray K, Rosenberg-Thompson S, Carusi D, et al. (1994) The Neuropsychiatric Inventory: comprehensive assessment of psychopathology in dementia. Neurology 44: 2308–2314.
18. Hughes C, Berg L, Danziger W, Coben L, Martin R (1982) A new clinical scale for staging of dementia. Br J Psychiatry 140: 566-572.
19. Folstein M, Folstein S, McHugh P (1975) "Mini-mental state" a practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 12: 189–198.
20. Reitan R (1958) Validity of the Trail Making Test as an indication of organic brain damage. Percept Mot Skills 8: 271–276.

21. Kaufman A, Lichtenberger E, Hoboken N (1999) Essentials of WAIS-III assessment, Psychology. Wiley, USA.
22. Allegri R, Fernandez Villavicencio A, Taragano F, Rymberg S, Mangone C (1997) Spanish version of the Boston Naming Test in Buenos Aires. The Clinical Neuropsychologist 11: 416–420.
23. Butman J, Allegri RF, Harris P, Drake M (2000) Fluencia verbal en español. Datos normativos en Argentina. Medicina 60: 561-564.
24. Wechsler Abbreviated Scale of Intelligence (WASI) (1999) San Antonio, Tex: The Psychological Corporation.
25. Signoret J, Whiteley A (1979) Memory battery scale. Intern. Neuropsych Soc Bull 2: 2–26.
26. Buschke H (1973) Selective reminding for analysis of memory and learning. Journal of Verbal Learning and Verbal Behavior 12: 543–550.
27. Shulman K (2000) Clock-drawing: is it the ideal cognitive screening test? Int J Geriatr Psychiatry 15: 548-561.
28. Lawton M, Brody E (1969) Assessment of older people: selfmaintaining and instrumental activities of daily living. The Gerontologist 9: 179-186.
29. Asociación Médica Mundial (2001) Declaración de Helsinski. Principios éticos para las investigaciones médicas en seres humanos. Rev Neurol Arg 26: 75-77.
30. Alexopoulos G (2003) Role of Executive Function in Late-Life Depression. J Clin Psychiatry 64: 18–23.
31. Steffens D, Skook I, Norton M, Hart AD, Tschanz JT, et al. (2000) Prevalence of depression and its treatment in an elderly population: the Cache County study. Arch Gen Psychiatry 57: 601–607.
32. Gallo J, Lebowitz B (1999) The epidemiology of common late-life mental disorders in the community: themes for the new century. Psychiatr Serv 50: 1158–1166.
33. Bruce M, Kim K, Leaf P, Jacobs S (1990) Depressive episodes and dysphoria resulting from conjugal bereavement in a prospective community sample. Am J Psychiatry 147: 608–611.
34. Harlow S (1991) A longitudinal study of risk factors for depressive symptomatology in elderly widowed and married women. Am J Epidemiol 134: 526–538.
35. Mendes de Leon C, Kasl S, Jacobs S (1994) A prospective study of widowhood and changes in symtoms of depression in a community simple of elderly. Psychol Med 24: 613- 624.
36. Zisook S, Shuchter S (1991) Early psychological reaction to the stress of widowhood. Psychiatry 54: 320- 333.
37. Wright SL, Persad C (2007) Distinguishing Between Depression and Dementia in Older Persons: Neuropsychological and Neuropathological Correlates. J Geriatr Psychiatry Neurol 20: 189-198.
38. Alexopoulos G (2005) Depression in the elderly. Lancet 365: 1961- 1970.
39. Fountoulakis K, O'Hara R, Iacovides A, Camilleri C, Kaprinis S, et al. (2003) Unipolar late- onset depression: A comprehensive review. Ann Gen Hosp Psychiatry 2: 11.
40. Saunders P, Copeland J, Dewey M, Davidson I, McWilliam C, et al. (1991) Heavy drinking as a risk factor for depression and dementia in elderly men. Findings from the Liverpool longitudinal community study. Br J Psuchiatry 159: 159-213.
41. Yaka E, Keskinoglu P, Ucku R, Gulmen Yener G, Tunca Z (2014) Prevalence and risk factors of depression among community dwelling elderly. Archives of Gerontology and Geriatrics 59: 150–154.
42. Chang-Quan H, Xue-Mei Z, Bi-Rong D, Zhen-Chan L, Ji-Rong Y, et al. (2010) Health status and risk for depression among the elderly: A meta-analysis of published literature. Age Ageing 39: 23–30.
43. Dillon C, Tartaglini M, Stefani D, Salgado P, Taragano F, et al. (2014) Geriatric depression and its relation with cognitive impairment and dementia. Arch Gerontol Geriatr 59: 450-456.
44. Dillon C, Serrano C, Iturry M, Taragano F, Popovich P (2009) Estudio Epidemiológico de la Depresion Geriatrica en un Laboratorio de Memoria. Revista Neurológica Argentina 1: 20-29.
45. World Health Organization (2001) The world health report. Meltal health; facing the challenges, building solutions. New Undurstanding, new hope. Geneva: World Health Organization.
46. Sivertsen H, Hanevold G, Engedal K, Selbæk G, Helvik A (2015) Depression and Quality of Life in Older Persons: A Review. Dement Geriatr Cogn Disord 40: 311–339.
47. Dillon C, Machnicki G, Serrano CM, Rojas G, Vazquez G, et al. (2011) Clinical manifestations of geriatric depression in a memory clinic: toward a proposed subtyping of geriatric depression. J Affect Disord 134: 177-187.
48. Beekman A, Copeland J, Prince M (1999) Review of community prevalence of depression in later life. Br J Psychiatr 174: 307–311.
49. Kim K, Lee M (2015) Depressive Symptoms of Older Adults Living Alone: The Role of Community Characteristics. Int J Aging Hum Dev 80: 248-263.
50. Brown M, Lapane K, Luisi A (2002) The management of depression in older nursing home patients. J Am Geriatr Soc 50: 69–76.