

High prevalence of depression found in post-ischemic stroke patients assessed in routine vascular clinic in a University Hospital from Mexico

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Abstract

Objective: The objective of this study was to determine the prevalence of depression in ischemic post-stroke patients in a routine vascular clinic evaluation in Mexico. **Methods:** Consecutive patients with ischemic stroke between January 2017 and July 2018 were enrolled. National Institute of Health Stroke Scale and Hamilton scales were used to assess neurological deficit and depression, respectively. The mRs was used to evaluate the degree of dependence in daily activities and the Barthel Index was used to measure functional independence. Quality of life was assessed using the SF-36 questionnaire. Follow-up appointment was performed between 3 months and 2 years post-stroke. **Results:** Of the 162 patients who met study inclusion criteria, 93 were contacted at 2 years of follow-up. Fifty-six were men (60.2%) and 37 were women (29.8%), with an average age of 63.5. About 36.6% of participants met the criteria for depressive disorder. **Conclusions:** There is a high prevalence of depression among patients who have suffered ischemic stroke as assessed in a routine vascular clinic evaluation.

Keywords: Ischemic stroke. Depression. Neurovascular clinic. Post-stroke care.

Alta prevalencia de depresión en pacientes después de un ictus isquémico evaluados de rutina en la clínica neurovascular de un Hospital Universitario de México

Resumen

Objetivo: Determinar la prevalencia de depresión después de un ictus isquémico en la evaluación de rutina de una clínica vascular en México. **Métodos:** Se incluyeron pacientes consecutivos con ictus isquémico de enero 2017 a julio 2018. Se realizaron las escalas clínicas del NIH para ictus y la escala de Hamilton para evaluar su estado funcional y la depresión, respectivamente. La escala modificada de Rankin se utilizó para evaluar el grado de dependencia en las actividades de la vida diaria y el índice de Barthel para medir el grado de la independencia funcional. La calidad de vida se evaluó con el cuestionario SF-36. Se dio seguimiento entre los 3 meses y 2 años posteriores al ictus. **Resultados:** De los 162 pacientes que cumplieron los criterios de inclusión, se logró contactar a 93 pacientes en el seguimiento a 2 años. 56 hombres (60.2%) y 37 mujeres (29.8%), con un promedio de edad de 63.5 años. El 36.6% de los participantes cumplieron los criterios de depresión. **Conclusión:** Hay una alta prevalencia de depresión entre los pacientes que han sufrido un ictus isquémico al ser evaluados de rutina en una clínica neurovascular.

Palabras clave: Ictus isquémico. Depresión. Consulta neurovascular. Cuidados post-ictus.

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Introduction

According to the World Health Organization, since the year 2000, stroke has been the second largest cause of mortality worldwide¹. Stroke is a disease classified by the presence of radiological, clinical, or pathological evidence of brain damage, which can be due to ischemia or hemorrhage in a defined cerebral vascular territory². Around 87% of strokes are ischemic in which blood flow is impaired due to a blood clot, and 10% are hemorrhagic³. Although most research surrounding prevention and intervention occurs in first world countries, more than 85% of strokes occur in low- and middle-income countries⁴. On the other hand, mental health disorders are becoming more common and are expected to increase by 2030⁵.

Mental health is still severely underfunded in many third world countries. In Mexico, only 2% of the total funding in health services is dedicated to mental health⁶, and of that 2%, more than three quarters of the money is dedicated to the maintenance of mental health hospitals⁷. This means services aimed at treating mental health difficulties are typically underfunded which is evidenced by the fact that < 40% of primary care centers have protocols to address mental health disorders⁶. Meanwhile, the prevalence of depression in the Mexican population ranges from 4 to 7.9%⁸. The ability for people to seek mental health assistance is further exacerbated by the stigma that prevails in society toward those seeking mental health care which is often fueled by the media^{7,9}. However, according to one study, patients can also feel stigma from mental workers themselves⁸.

Depression in post-stroke patients occurs in almost a third of all patients and is considered the most common and important neuropsychiatric complication affecting the quality of life and prognosis of patients¹⁰. Depression has been shown to increase mortality rates by up to 10 times, therefore highlighting the importance of this condition in detrimentally affecting the recovery of patients¹¹.

Despite the plethora of studies highlighting the prevalence and impact of depression in those who have suffered strokes, there is limited research which studies this in developing countries. This is important because there is a lack of information regarding the prognosis of these patients, as mental health services might not be available to most of them. This study aimed to bridge current gaps in knowledge by determining the prevalence and implications of depression for those

who have suffered ischemic stroke in a routine vascular clinic evaluation in Mexico.

Material and methods

A prospective cohort with a transversal evaluation was done. Patients with ischemic stroke who arrived to the Neurology Service from the Hospital Universitario “Dr. Jose Eleuterio Gonzalez” in Monterrey, Nuevo Leon, Mexico, from January of 2017 to July 2018 were recruited. The following clinical scales were performed to evaluate severity of stroke and functionality while the patients were at the hospital: the National Institute of Health Stroke Scale (NIHSS)¹², mRs¹³, Barthel¹⁴, and the Trial of Org 10172 in Acute Stroke Treatment (TOAST)¹⁵. The NIHSS scale measures the neurological deficit of the patient. The Rankin scale measures the degree of disability or dependence in daily activities, the Barthel index assesses functional independence, and TOAST is used to classify the etiology of the stroke. The exclusion criteria were patients under 18 years old, history of depression or mental disorders, and aphasia.

The follow-up was completed by present evaluation and by phone. In the follow-up, the aforementioned clinical scales were used, and two new scales were added: the Hamilton Depression Rating Scale (HDRS; 13) and the SF-36 questionnaire¹⁶. The HDRS is a questionnaire used to assess the severity of depressive symptoms and to evaluate the response to treatment. Patients were categorized as depressed if they scored higher than 8. Patients completed the SF-36 questionnaire in person, and this was used to evaluate their quality of life. Patients with depression were sent to the neuropsychological clinic.

A descriptive analysis of the demographic and clinical variables was conducted. For the categorical variables, a univariate analysis with the exact “X” test was performed. For the categorical and variance variables, a Fisher’s test was conducted. For the continuous nonparametric variables, Mann–Whitney’s test was performed. Finally, a logistic multivariate regression analysis was done to identify independent risk factors. Results are expressed in percentages and medians with standard deviations (\pm). Statistically significant values are considered to be $p < 0.05$. SPSS version 20.0 was used to perform all the statistical analyses.

Results

In total, 93 out of 162 eligible patients were evaluated in routine neurovascular clinic and contacted by phone between 3 months and 2 years post-stroke event. The remaining 69 eligible patients could not be contacted or did not come to the present evaluation. Fifty-six (60.2%) of the patients were male and 27 (29.8%) were female. The average age was 63.5 ± 14.08 ranging from 34 to 91 years. The mean time since the stroke and the clinical or telephonic evaluation was 93 weeks. The most common risk factors for ischemic stroke were high blood pressure, diabetes mellitus, and cardiopathy (Table 1).

More than half of the patients enrolled in this study had minor or moderate impairment defined by a value less than 11 as measured by the NIHSS scale (Table 1) during their hospitalization. Less than 25% of the patients were categorized with a moderate to severe or severe impairment (Table 1).

In the follow-up performed between 3 months and 2 years after the stroke event, more than 85% of patients showed minor or no impairments as measured by the NIHSS scale (Table 1).

The follow-up also showed that 34 patients (36.6%) (Table 2) presented as having a depressive disorder as classified by the HDRS: 28% had mild depression, 3.2% moderate depression, 4.3% severe depression, and 1.1% very severe depression. About 8.6% reported having had suicidal ideation, and 3 patients (3.2%) had thought about how to carry it out (planning). No suicides were carried out. In addition, depressed patients tended to have higher scores in all the HDRS points except for hypochondriasis and insight when compared to non-depressed patients (Table 2).

Meanwhile, the SF-36 scale found that non-depressed patients had higher scores for quality of life than depressed patients. Only 1% of the patients who met the criteria for having depression were receiving treatment at the time of the study. The complete details of the differences between depressed and non-depressed patients are described in table 2.

All the patients that were diagnosed with depression were sent to be evaluated and treated by psychiatrists.

Discussion

This study found a high prevalence of depressive disorders among ischemic stroke patients in a routine vascular clinic evaluation (36.6%). These findings are in line with results from other studies regarding the

prevalence of depression in post-stroke patients^{17,18}. It is important to mention that only 1% of the patients that met the criteria for depression in this study were already in treatment, suggesting that many people who suffer stroke do not receive a diagnosis of depression or receive mental health treatment.

One study in Colombia found that post-stroke patients had overall more depression and stress when compared to age-matched controls¹⁹. Indeed, another study involving ischemic stroke, intracerebral hemorrhage, or cerebral venous thrombosis showed that depression and vascular cognitive impairment were common findings appearing in almost half of the patients²⁰.

Depression is a frequent disorder in the Mexican population and stigma toward mental health disorders is prevalent in society^{21,22}. This may explain why many participants did not have any previous diagnosis of depression despite scoring highly for symptoms of depression.

This is the first study conducted in Mexico which evaluates depression in post-stroke patients in a routine vascular clinical evaluation which evaluates ischemic stroke only. There is other research that shows a higher amount of depression in patients who have suffered a stroke or vascular disorder (near 50%) compared to this study (36.6%). This difference might be related to the inclusion of different pathologies, and by the different age gap, with a mean age of 56 compared to 63.5²⁰.

Remission of post-stroke depression in the first few months after the stroke event is associated with greater recovery in activities of daily life²³. Therefore, conducting a longer follow-up might have provided a more detailed assessment of the quality of life of our patients.

There are plenty of different treatments for depression, the most used worldwide being pharmacological with SSRIS and TCA²⁴. Other therapies, such as CBT or acupuncture, should also be used as an adjuvant to improve the outcome^{24,25}. Research is now focusing on the role that gut microbiota plays in depression, showing a different path that could also benefit the outcomes of the actual therapy²⁶.

The result from this study highlights the importance of screening for depression in post-stroke patients in the routine vascular clinic evaluation even if they do not have clear symptoms of depression, as prevalence is high among these patients.

Nevertheless, this study also has weaknesses. One of them is that the follow-up was not divided by time periods, which might have shown that depression might become common as the patients have to struggle or adapt to their disabilities. In addition, there is no information about the outcomes of the depressed

Table 1. Population characteristics, neurological deficits, and differences between depressed and non-depressed patients

Patients with ischemic stroke (n = 93)			
Demographic and clinical variables of the population	Non-depressed patients (n = 59)	Depressed patients (n = 34)	p-value
Male, n (%)	37 (62.7%)	19 (55.9%)	NS
Age, media ± SD	62 ± 3	66 ± 4	NS
Cardiovascular risk factors			
Hypertension	42 (71.2%)	28 (82.4%)	NS
Diabetes	26 (44.1%)	13 (38.2%)	NS
Smoking	22 (37.3%)	9 (26.5%)	NS
Sedentarism	31 (52.5%)	23 (67.6%)	NS
Dyslipidemia	14 (23.7%)	11 (32.4%)	NS
Alcohol consumption	19 (32.2%)	11 (32.4%)	NS
Heart disease	13 (22%)	11 (32.4%)	NS
Previous stroke	9 (15.2%)	6 (17.6%)	NS
Drug abuse*	3 (5.1%)	1 (2.9%)	NS
Ischemic Stroke Etiology, n (%) TOAST			
Atherosclerosis	23 (39.0%)	12 (41.2%)	NS
Small vessels disease	9 (15.3%)	4 (11.8%)	NS
Cardioembolism	8 (13.6%)	8 (23.5%)	NS
Indeterminate	19 (32.2%)	8 (23.5%)	NS
Vascular territory **			
Carotid (ICA, MCA, ACA)	41 (69.5%)	21 (61.8%)	NS
Vertebrobasilar (PCA, SCA, PICA, BA)	12 (20.3%)	7 (20.6%)	
Neurological functional scales:			
NIHSS at hospital admission			
NIHSS 1-5	27 (45.8%)	9 (26.5%)	0.049
NIHSS 6-12	25 (42.4%)	9 (26.5%)	
NIHSS 13-18	6 (10.2%)	12 (35.3%)	
NIHSS >18	1 (1.7%)	4 (11.8%)	
NIHSS at hospital discharge			
Without deficit	14 (23.7%)	6 (17.6%)	0.038
NIHSS 1-5	31 (52.5%)	6 (17.6%)	
NIHSS 6-12	13 (22.0%)	12 (35.3%)	
NIHSS 13-18	1 (1.7%)	9 (26.5%)	
NIHSS >18	0	1 (2.9%)	
Modified Rankin scale (mRS) and Barthel Index for Activities of Daily Living.			
mRS at discharge	2 (1-5)	3 (2-5)	< 0.01
Barthel index; media ± SD	76.2 ± 9	49.4 ± 7	< 0.001
Days of hospitalization, n (range)	6.4 (2-14)	6.71 (2-19)	NS
NIHSS at the interview moment (between 3 months and 2 years after stroke).			
Without déficit	35 (59.3%)	7 (20.6%)	< 0.030
NIHSS 1-5	22 (37.3%)	16 (47.1%)	
NIHSS 6-12	2 (3.4%)	8 (23.5%)	
NIHSS 13-18	0	3 (8.8%)	
NIHSS >18	-	-	
mRS at follow-up	1 (0-4)	3 (1-4)	< 0.01
Barthel at follow-up	96.9 ± 5	76.5 ± 7	< 0.001
Time of follow-up, days	663.4	633.5	NS

*Marihuana, cocaine or toluene.

**Vascular territory information available for only 81/93 patients.

NIHSS: National Institutes of Health Stroke Scale; mRS: modified Rankin scale.

Table 2. Differences between depressed and non-depressed patients as assessed using the Hamilton depression scale and the SF-36 questionnaire

Hamilton scale at the follow-up interview			
Items of Hamilton scale and SF-36	Non-depressed patients n = 59 (%)	Depressed patients n = 34 (%)	p-value
Depressive mood	16 (27.1)	29 (85)	< 0.001
Psychiatric anxiety	1 (1.7)	14 (41.2)	< 0.001
Somatic anxiety	11 (18.6)	17 (50.0)	0.002
Gastrointestinal somatic symptoms	15 (25.4)	16 (47.1)	0.029
General somatic symptoms	8 (12.6)	23 (67.6)	< 0.001
Genital symptoms	10 (16.9)	18 (52.9)	< 0.001
Hypochondriasis	4 (6.8)	5 (14.7)	NS
Weight loss	3 (5.1)	21 (61.8)	< 0.001
Insight	1 (1.7)	2 (5.9)	NS
Feelings of guilt	9 (15.3)	24 (70.6)	< 0.001
Suicidal thoughts	1 (1.7)	16 (47.71)	< 0.001
Initial insomnia	12 (20.3)	26 (76.5)	< 0.001
Insomnia during the night	6 (10.2)	16 (47.71)	< 0.001
Delayed insomnia	9 (15.3)	13 (38.2)	< 0.001
Effect in work and interests	24 (40.7)	33 (97.1)	< 0.001
Retardation (apathy)	5 (8.5)	15 (44.1)	< 0.001
Agitation	4 (6.8)	19 (55.9)	< 0.001
SF-36 questionnaire			
Limitations in physical activities (health problems)	70.91	51.32	0.001
Limitations in usual activities (physical)	76.69	27.94	< 0.001
Limitations in usual activities (emotional)	89.83	83.33	NS
Vitality	73.38	56.76	< 0.001
General mental health	88.13	72.11	< 0.001
Limitations in social activities	93	69.85	< 0.001
Body pain	88.98	59.26	< 0.001
General health perceptions	69.76	51.02	< 0.001

patients that were referred to receive pharmacological therapy.

Conclusions

Depression in post-stroke patients is common in a routine vascular clinic evaluation, and more efforts should be made to diagnose and treat this condition in those suffering stroke.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that no patient data appear in this article. Furthermore, they have acknowledged and followed the recommendations as per the SAGER guidelines depending on the type and nature of the study.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Use of artificial intelligence for generating text. The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

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