

Post stroke depression among Iranian patients

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ABSTRACT

الأهداف: تقييم مدى انتشار الاكتئاب، والعوامل المساهمة في حلقة بعد الجلطة.

الطريقة: أجريت دراسة مرتقبة شملت 200 مريضاً على التوالي، مصابين بانسداد صمامات حادة في المخ في مستشفى علي ابن ابي طالب - رفسنجاني - إيران، خلال الفترة مابين سبتمبر 2006م وحتى سبتمبر 2007م. تم تشخيص وجود انسداد حاد في صمامات في المخ وأدلى الأعصاب بواسطة طبيب مخ وأعصاب وتم تأكيد ذلك بواسطة الرنين المغناطيسي. تردد من الاكتئاب، وفقاً لمعايير سوق الدوحة للأوراق المالية إلى الرابع (DSM-IV)، والبيانات الديموغرافية، وبعض العوامل المساهمة تم تسجيلها وتحليلها بواسطة اختبار (χ^2) وطريقة التراجع اللوجستي.

النتائج: كان متوسط عمر المرضى هو 61.15 ± 8.66 عاماً. اثنان وثلاثون في المائة من المرضى يعانون من الاكتئاب. تواتر الاكتئاب كانت أعلى بكثير لدى النساء (40.9%) منها في الرجال (21.1%) ($p=0.004$). لم يكن هناك علاقة بين الاكتئاب، العمر، مكان الآفة وعوامل الخطر للسكتة الدماغية. كان ارتفاع ضغط الدم (34%)، داء السكري (15%)، التدخين (14%)، وعالية الدهون (14%) هي أكثر من عوامل الخطر.

خاتمة: أظهرت نتائجنا وبشكل عام أن الاكتئاب ما بعد السكتة الدماغية سائدة في مجتمعنا، وهو أكثر بروزاً لدى النساء. ويمكن للتشخيص المبكر والعلاج أن يساعد على تحسين نوعية الحياة لهؤلاء المرضى.

Objectives: To assess the incidence of depression and its contributing factors after an episode of stroke.

Methods: This prospective study was performed on 200 consecutive patients with acute ischemic stroke admitted to Aliebne-Abitaleb Hospital in Rafsanjan, Iran, from September 2006 to September 2007. The diagnosis of acute ischemic stroke was made by a neurologist and confirmed by MRI. Frequency of depression, according to DSM-IV criteria, as well as demographic data and some contributing factors were registered and analyzed by chi squared test and the logistic regression method.

Results: The mean age of patients was 61.15 ± 8.66 years. Thirty-two percent of patients suffered depression. The frequency of depression was significantly higher in women (40.9%) than men (21.1%) ($p=0.004$). There was no significant relation between depression and age, location of lesion, and risk factors for stroke. Hypertension (34%), diabetes (15%), smoking (14%), and hyperlipidemia (14%) were the most common risk factors.

Conclusions: Generally, our results show that post stroke depression is prevalent in our society, and this is more prominent among women. Early diagnosis and treatment can help to improve quality of life of these patients.

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Stroke is the most common neurological disorder with the highest complication rate. Depression is among the most frequent psychiatric disorders in patients with stroke and its prevalence has been reported between 20-50% of cases.¹ This disorder increases mortality and physical dependence and causes a poor response to rehabilitation measures;²⁻⁴ a process that begins after stroke and shows increased risk months and even years afterwards.⁵ Post stroke depression may be a result of cerebral lesions or psychological reactions.⁶ It seems that the rate of depression increases with the passing of time following stroke, and is related with female gender, age more than 75, history of prior stroke, and severe debilitation at the onset of stroke.⁷⁻⁹ However, a review in this field could not determine the main risk factors for development of depression in stroke patients with a good power.¹⁰ Some studies showed a relation between the location of lesion and depression,¹ although some others could not confirm such an association.¹¹ Considering the above-mentioned factors and the lack of similar studies in Iranian patients, we attempted to

study the incidence of depression in patients with acute ischemic stroke and its relation with some predisposing factors

Methods. We conducted a prospective cohort study on patients with a first episode of acute ischemic stroke admitted to Aliebne-Abitaleb Hospital in Rafsanjan, Iran, from September 2006 to September 2007. Diagnosis of ischemic stroke was made by a neurologist and confirmed by 1.5 tesla brain MRI. Enhanced MRI was performed if necessary. The research ethics committee of Rafsanjan University of Medical Sciences approved the study protocol, and all patients gave informed consent before enrollment in the study. Patients were evaluated for depression using DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th edition) criteria within 24 hours of admission and 3 months later by a single neurologist. The severity of depression was assessed by the Beck questionnaire. To assess the incidence rate of depression after stroke, patients with depression on admission were excluded from the study. Also, patients with a history of depression, dementia, psychosis, psychiatric drug use, narcotic or alcohol abuse, or severe concomitant illness were excluded from the study. Patients who acquired another disease during the study period were excluded. After obtaining consent, patients participated in this study by completing a questionnaire. The neurologist completed the questionnaire related to psychiatric status and the patient completed the questionnaire including demographic information. The risk factors studied were: current smoking (regular use of one or more tobacco products more than once daily currently or within 30 days prior to interview);⁶ hyperlipidemia (total cholesterol ≥ 5 mmol/L; HDL < 1 mmol/L in men or < 1.1 mmol/L in women);⁷ family history of cardiovascular disease (before 55 in first-degree male relatives and before 65 in first-degree female relatives);⁸ hypertension (systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg or antihypertensive medication)⁹ and diabetes mellitus (diabetes symptoms and random plasma glucose ≥ 200 mg/dl, or fasting plasma glucose ≥ 126 mg/dl, or 2 hour post prandial plasma glucose ≥ 200 mg/dl).¹⁰

Continuous quantitative variables were expressed as mean \pm standard deviation (SD) and qualitative variables as percents. Quantitative variables were compared by either student t-test (if normally distributed) or Mann-Whitney test (if not normally distributed). Chi squared and Fischer's exact tests were used to compare qualitative variables. Data were analyzed using SPSS version 14, and a *p*-value of less than 0.05 was considered significant.

Results. Two hundred patients, including 90 males (45%) and 110 females (55%) were studied. The mean

age of patients was 61.15 ± 8.66 years. The mean age of men was 62.06 ± 9.63 and of women was 60.25 ± 9 years. Thirty-four percent had hypertension, 15% had diabetes, 14% were smokers, and 14% had hyperlipidemia. Use of oral contraceptives was noted in 4.5% of cases. In the current study, 20 patients (10%) had infratentorial, 139 patients (69.5%) had supratentorial involvement, and 41 patients (20.5%) had lesions in both systems. We observed no significant relation between depression and either risk factors for stroke or location of the lesion, although infratentorial lesion was more common in depressed patients than in the non-depressed group. In this study, depression was diagnosed in 64 (32%) of patients after 3 months of stroke (Table 1). Mean Beck score in these patients increased from 6 ± 2 at admission to 18 ± 3 after 3 months. Stepwise logistic regression analysis showed that among studied risk factors, only female gender was related to depression as a predictor (odds ratio: 2.587, 95% confidence interval: 1.374 – 4.872; *p*=0.004) (Table 1). There was no significant relation between depression and age, location of lesion, and stroke risk factors.

Discussion. Stroke is on the top of the list of neurological disorders in terms of high frequency, recurrence rates, mortality, and complication rate. A broad range of these patients suffer post stroke psychiatric illnesses that profoundly affect the physical and mental condition of them and their families and eventually their prognosis and quality of life. Depression is the leading post stroke psychiatric illness that is itself associated with many complications.¹² This disorder causes a reduction in physical and cognitive rehabilitation and the quality of life of the sufferer. It also increases mortality.¹⁰ In this study, the 23% frequency

Table 1 - Baseline characteristics of patients by depression status at 3 months after an acute ischemic stroke.

Characteristic	Depressed	Not depressed	P-value
	n=64	n=136	
	n (%)		
<i>Gender</i>			
Male	19 (29.6)	71 (52.2)	<0.001
Female	45 (70.3)	65 (47.8)	0.007
Hypertension	37 (57.8)	31 (22.8)	<0.001
Diabetes	14 (21.8)	16 (11.7)	0.06
Hyperlipidemia	15 (23.4)	13 (9.5)	0.008
Smoking	12 (18.7)	16 (11.7)	0.18
<i>Lesion location</i>			
Infratentorial	11 (17.2)	9 (6.6)	<0.001
Supratentorial	35 (54.9)	104 (76.4)	<0.001
Both infra and supratentorial	18 (28.1)	23 (16.9)	0.06

of depression reflects its high prevalence. In a 3-month follow up, 50% of patients in Finland,¹³ and 24% of patients in Sweden,¹⁴ were depressed. In research, the prevalence reached 37% in a one year period.^{15,16} It is estimated that in the United States, one third of stroke patients have depression.¹⁷ It seems that the results of these studies are influenced by diagnostic criteria used, follow-up period, and severity of depression;¹² in a study in Finland,¹³ 31% of patients had major depression and 9% had minor depression. Khan concluded¹⁸ that the peak prevalence of depression occurs between months 6-24. Carod-Artal³ studied the incidence of depression as a threatening complication in stroke survivors in a one year follow-up, and noticed that post stroke depression has a high prevalence in the society and in late follow-up studies, and is also associated with various levels of debilitation and health alteration. In another study, Turner-Stokes et al⁴ evaluated the diagnosis and prevalence of post depression stroke and reported that it has a high prevalence and that it is associated with social, functional, and cognitive deficits as well as potential limitations in response to rehabilitative efforts.⁴ In 2005, a study at the Neurological Center of Sweden reported that crying and obvious sadness are reliable indicators for depressed mood in post stroke patients. It was also demonstrated that in these patients crying, younger age, and severe disability are predisposing factors for depression in the first year following stroke.⁷ Although depression is mostly studied in short-term follow-ups, some studies suggest a higher prevalence in long-term follow up; in a study in Spain, only 30% of patients had depression at discharge, whereas at the end of the first year this proportion reached 67%.⁷ It has been shown that during the first 5 years of stroke, there is some degree of depression and stroke is associated with excess mortality.¹⁹ It is of note that depression itself increases the risk of stroke; as emphasized by 2 separate studies in Japan and Baltimore.^{10,20} Studies demonstrate the effectiveness of anti depressant drugs in the post stroke period in improving quality of life.^{2,3,5} In the current study, the incidence of depression was significantly higher in women ($p=0.003$). This is in accordance with other studies. In Sweden, after 3 months of follow-up, 12% of men and 16% of women had depression.⁸ Similar results were obtained in other studies.^{8,10} It seems that female gender is a risk factor for post stroke depression and women deserve closer attention. In the present study, there was no significant relation between location of lesion and occurrence of depression. Although this is similar to results obtained in Carson et al's study,¹¹ this is an area of controversy. In a study in Taiwan,²¹ subcortical lesions were more commonly associated with depression. In another study in Sweden, this increase was associated with frontal lesions; and yet

another study showed increased incidence of depression in temporal lesions.^{15,16,22} We did not observe any significant relation between depression and either age or other risk factors for stroke. This has been repeated in various other reports.^{3,15,16} In contrast to our study, Williams et al²³ showed that older people are more prone to stroke due to different reasons; including immobility. The mechanisms of post stroke depression are studied and suggested theories include direct cerebral lesions and psychological reactions.^{6-9,12} Fifty percent of the patients studied had one or more risk factors for stroke. Hypertension, diabetes, smoking, and hyperlipidemia were the most common risk factors. These are the major risk factors reported in various research.²⁴⁻²⁶ The important point on risk factors is that all of them may be controlled or eliminated and therefore, the prevalence of stroke can be reduced.

Future case-control studies with larger sample size and a more prolonged follow-up period in stroke patients is warranted to clarify the details and progression rate in this group of patients. The short follow-up period and excluding the patients with the history of depression were limitations of the present study.

In general, our results show that post stroke depression is prevalent in our society and this is more prominent among women. Early diagnosis and treatment can help improve the quality of life of patients.

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References

1. Robinson RG, Starr LB, Lipsey JR, Rao K, Price TR. A two-year longitudinal study of post-stroke mood disorders: dynamic changes in associated variables over the first six months of follow-up. *Stroke* 1984; 15: 510-517.
2. Hackett ML, Anderson CS, House AO. Management of depression after stroke: a systematic review of pharmacological therapies. *Stroke* 2005; 36: 1098-1103.
3. Carod-Artal FJ. Post-stroke depression (I). Epidemiology, diagnostic criteria and risk factors. *Rev Neurol* 2006; 42: 169-175.
4. Turner-Stokes L, Hassan N. Depression after stroke: a review of the evidence base to inform the development of an integrated care pathway. Part 2: Treatment alternatives. *Clin Rehabil* 2002; 16: 248-260. Review.
5. Sonis J. Mortality and poststroke depression. *Am J Psychiatry* 2004; 161: 1506-1507.
6. Friedman EH. Neurobiology of poststroke depression. *Stroke* 2004; 35: 1789.
7. Carod-Artal FJ, González-Gutiérrez JL, Egado-Herrero JA, Varela de Seijas E. Post stroke depression: predictive factors at one year follow up. *Rev Neurol* 2002; 35: 101-106.
8. Eriksson M, Asplund K, Glader EL, Norrving B, Stegmayr B, Terént A, et al. Self-reported depression and use of antidepressants after stroke: a national survey. *Stroke* 2004; 35: 936-941.

9. Ohira T, Iso H, Satoh S, Sankai T, Tanigawa T, Ogawa Y, et al. Prospective study of depressive symptoms and risk of stroke among Japanese. *Stroke* 2001; 32: 903-908.
10. Hackett ML, Anderson CS. Predictors of depression after stroke: a systematic review of observational studies. *Stroke* 2005; 36: 2296-2301.
11. Carson AJ, MacHale S, Allen K, Lawrie SM, Dennis M, House A, et al. Depression after stroke and lesion location: a systematic review. *Lancet* 2000; 356: 122-126.
12. Terroni Lde M, Leite CC, Tinone G, Fráguas Jr R. Post stroke depression: risk factors and antidepressant treatment. *Rev Assoc Med Bras* 2003; 49: 450-459.
13. Kauhanen M, Korpelainen JT, Hiltunen P, Brusin E, Mononen H, Määttä R, et al. Poststroke depression correlates with cognitive impairment and neurological deficits. *Stroke* 1999; 30: 1875-1880.
14. Aström M. Generalized anxiety disorder in stroke patients. A 3-year longitudinal study. *Stroke* 1996; 27: 270-275.
15. Aben I, Denollet J, Lousberg R, Verhey F, Wojciechowski F, Honig A. Personality and vulnerability to depression in stroke patients: a 1-year prospective follow-up study. *Stroke* 2002; 33: 2391-2395.
16. Aben I, Verhey F, Strik J, Lousberg R, Lodder J, Honig A. A comparative study into the one year cumulative incidence of depression after stroke and myocardial infarction. *J Neurol Neurosurg Psychiatry* 2003; 74: 581-585.
17. Williams LS, Ghose SS, Swindle RW. Depression and other mental health diagnoses increase mortality risk after ischemic stroke. *Am J Psychiatry* 2004; 161: 1090-1095.
18. Khan F. Poststroke depression. *Aust Fam Physician* 2004; 33: 831-834.
19. Pinoit JM, Bejot Y, Rouaud O, Benatru I, Osseby GV, Bonin B, et al. Post-stroke depression, another handicap. *Presse Med* 2006; 35: 1789-1793.
20. Larson SL, Owens PL, Ford D, Eaton W. Depressive disorder, dysthymia, and risk of stroke: thirteen-year follow-up from the Baltimore epidemiologic catchments area study. *Stroke* 2001; 32: 1979-1983.
21. Yu L, Liu CK, Chen JW, Wang SY, Wu YH, Yu SH, et al. Relationship between post-stroke depression and lesion location: a meta-analysis. *Kaohsiung J Med Sci* 2004; 20: 372-380.
22. Pohjasvaara T, Leppävuori A, Siira I, Vataja R, Kaste M, Erkinjuntti T. Frequency and clinical Determinants of post stroke Depression. *Stroke* 1998; 29: 2311-2317.
23. Williams CL, Rittman MR, Boylstein C, Faircloth C, Haijing Q. Qualitative and quantitative measurement of depression in veterans recovering from stroke. *J Rehabil Res Dev* 2005; 42: 277-290.
24. Hart CL, Hole DJ, Smith GD. Comparison of risk factors for stroke incidence and stroke mortality in 20 years of follow-up in men and women in the Renfrew/Paisley Study in Scotland. *Stroke* 2000; 31: 1893-1896.
25. Hart CL, Hole DJ, Smith GD. The contribution of risk factors to stroke differentials, by socioeconomic position in adulthood: the Renfrew/Paisley Study. *Am J Public Health* 2000; 90: 1788-1791.
26. Glynn RJ, Rosner B. Comparison of risk factors for the competing risks of coronary heart disease, stroke, and venous thromboembolism. *Am J Epidemiol* 2005; 162: 975-982.

Related topics

Ahangar AA, Hosseini S. Epidemiological evaluation of post stroke depression in Babol, Northern Iran. *Neurosciences* 2009; 14: 102-103.

Zahiroddin AR, Shafiee-Kandjani AR, Ghoreishi FS. Depression rate among 18-40-year-old patients suffering from generalized tonic-clonic epilepsy referred to Neurology Clinics in an Iranian Hospital. *Neurosciences* 2008; 13: 86-87.

Albedaiwi WA, Goldberg BG, Lapidus J, Muench JP. Utility of an intervention to detect depression in primary care. *Neurosciences* 2005; 10: 284-290.