

# Post-stroke depression and hospital admission

## *A need for nursing care partition according to the clinical condition*

Farhad Iranmanesh, MD.

### ABSTRACT

**الأهداف:** التحقق من معدل انتشار الاكتئاب بعد الجلطة وعلاقتها بحالة الإدخال إلى المستشفى.

**الطريقة:** في دراسة الحالة هذه، تم تقسيم 120 مريض مصاب بجلطة اقفارية دماغية من مستشفى علي بن طالب - رفسنجان - إيران خلال الفترة من 2004 إلى 2006م. أدخل 60 مريض جدا المستشفى (شمل المرضى المصابين بالهذيان، ونقص الوعي، والذهول، والغيبوبة، واضطراب المصري، واضطراب البلع مع إدخال الأنبوبة المعدية الأنفية، والمرضى المتوفين (حالات)). وتم إدخال 60 مريض غير قريبين من المرضى غير سليمين جدا (مجموعة التحكم). تمت مطابقة جميع المرضى لعوامل الجلطة الخطيرة، والموقع، وحجم الآفة. تم إدخالهم جميعا المستشفى لمدة أسبوع على الأقل. تم تقدير الاكتئاب على المكوث في المستشفى، وبعد أسبوع من الدخول للمستشفى طبقا لاستبيان قائمة بك. كما تم تحليل النتائج بواسطة اختبار فيشر المطابق.

**النتائج:** كان متوسط عمر المرضى  $63 \pm 4$  عام، و 65% من المرضى نساء. ارتفع معدل الإصابة بالاكتئاب في المرضى القريبين للمرضى غير سليمين جدا في اليوم السابع من الإدخال للمستشفى بنسبة إحصائية مهمة في جميع المرضى عن مجموعة التحكم ( $p < 0.001$ ). وفي تحليل طبقا للجنس كانت هذه الزيادة ذات دلالة إحصائية مهمة فقط لدى النساء ( $p < 0.001$ ).

**خاتمة:** أن الإدخال للمستشفى لمرضى الجلطات من غير التمييز بين الحالة السريرية يرفع من معدل الاكتئاب في هؤلاء المرضى.

**Objectives:** To investigate the prevalence of post stroke depression and its association with hospital admission conditions.

**Methods:** In this case-control study, 120 patients with ischemic cerebral stroke from Aliebne-Abitaleb Hospital, Rafsanjan, Iran, during 2004-2006 were evaluated. Sixty patients were hospitalized near very ill patients (including patients with delirium, decreased consciousness, stupor, coma, sphincteric disorders,

ingestion disorder with nasogastric tube insertion, and deceased patients) (cases), and 60 were admitted not adjacent to ill patients (controls). All patients were matched for stroke risk factors and location and size of lesion, and all were admitted to hospital for at least one week. Depression was assessed on admission and after one week according to the Beck inventory questionnaire. The results were analyzed using Fisher's exact test.

**Results:** The mean age of the patients was  $63 \pm 4$  years, and 65% were female. The depression rate in all patients adjacent to ill patients significantly increased by the seventh day of admission compared with the control group ( $p < 0.001$ ). On analysis according gender, this increase was significant only in women ( $p < 0.001$ ).

**Conclusion:** Hospitalization of stroke patients without considering separation according to clinical condition, increases the depression rate in these patients.

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*From the Department of Neurology, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.*

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*Address correspondence and reprint request to: Dr. Farhad Iranmanesh, PO Box 13185-1678, Tehran, Iran. Tel. +98 (21) 66439463. Fax. +98 (21) 66919206. E-mail: sut\_f@yahoo.com*

Cerebral stroke is the most common, and complex neurological disorder.<sup>1</sup> Depression is the most common psychological disorder in the acute phase, and long term follow up of cerebral stroke and its prevalence has been reported between 20-65% in stroke patients.<sup>2,3</sup> Post stroke depression causes increase in patients' morbidity and mortality,<sup>4,5</sup> patients' physical dependence,<sup>2</sup> and interferes with rehabilitation outcome.<sup>4</sup> Various factors are involved in developing post stroke depression. One of these factors is the physical condition of patients' roommates during the hospitalization period. It is well known that patient

separation considering special aspects is essential, such as separation of patients with infectious disease, invasive patients, patients with ischemic heart disease, and coma. The risk of infectious transmission, injury to others, and need for special services are reasons for separation. Previous studies have shown that patient separation is required for neurological disorders, although this separation is limited to stroke patients in many countries.<sup>6</sup> Stroke units have recently been finding their position in these countries. Without considering the need for special care in the stroke unit, which is the first aim of the organization of these units, other care aspects, such as roommate condition and effect of this neighboring on patients' health during the hospitalization period, should be considered in stroke patients. The poor condition and illness of roommates with the same diagnosis may cause depression and anxiety in other patients. Considering these points, the present study was designed to investigate the effect of the poor conditions of roommates during the admission period in developing post stroke depression.

**Methods.** In this case-control study, 120 consecutive patients with ischemic cerebral stroke in Aliebne-Abitaleb Hospital, Rafsanjan, Iran, during 2004-2006 were included. Ischemic cerebral stroke was diagnosed by a neurologist according to the World Health Organization criteria,<sup>7</sup> and verified by brain MRI. The study protocol was approved by the research ethics committee of Rafsanjan University of Medical Sciences, and all patients gave informed consent before enrollment in the study. All cases experienced stroke for the first time, and all were admitted with unilateral body weakness between 3/5 and 4/5. Patients with consciousness and speech disorder, history of underlying disease such as diabetes, heart disease, depression, history of psychological drug usage, and patients with a history of opium and alcohol abuse were excluded from the study. Delirium, unconsciousness, stupor, coma, sphincteric disorder, ingestion disorder with need for nasogastric (NG) tube insertion, and deceased patients were considered as ill conditions. Patients were randomly assigned to the case or control group. Sixty patients in the case group passed their hospitalization period adjacent to ill patients (in a common room), and 60 patients in the control group were admitted to other rooms, not adjacent to ill patients during their hospitalization period. The nursing care and other factors were the same for the 2 groups, and the proximity to very ill patients was the only variable different between the 2 groups. All patients were hospitalized at least for one week and were matched for risk factors. The cerebral lesion in all patients was limited to the middle cerebral

artery area. None of our patients needed NG tube or urinary catheter insertion during the admission period. The Beck Depression Inventory, a 21-item screening questionnaire comprising 13 cognitive, and 8 somatic questions, was used to screen for depression. The Beck Depression Inventory has been validated in various patient populations.<sup>8,9</sup> Depression was assessed using the Beck questionnaire on the first and seventh day of admission by a single trained physician who was blind to the patient grouping, and Beck scores more than 10 were considered as depressed.

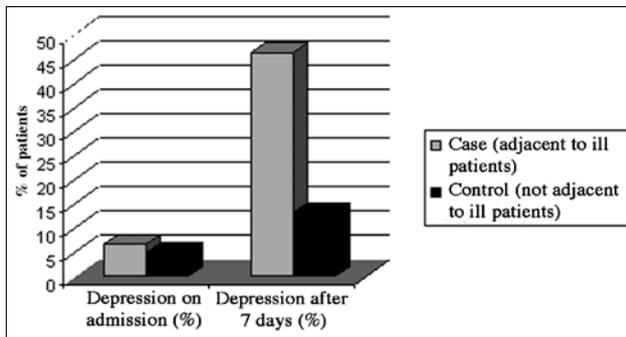
The results were analyzed by SPSS software version 11 using Fisher's exact test and independent sample t-test. A *p*-value less than 0.05 was considered significant.

**Results.** The patients' mean age was 63±4 years (range: 37-78 for women, 35-83 for men) and 78 (65%) were female. There was no significant difference in patients' age, duration of hospitalization, gender distribution, and history of hypertension, smoking, and hyperlipidemia between the 2 groups (Table 1). The depression rate was not significantly different between the case and control groups on admission (6.6% in cases versus 5% in controls, *p*=0.7). The depression rate increased in both groups (46.6% in cases versus 13.3% in controls) after 7 days of admission, but this increase was significant only in the case group (*p*<0.001, odds ratio: 4.8, 95% confidence interval (95% CI): 1.96-11.74 for cases, and *p*=0.1 for controls) (Figure 1). The depression rate after 7 days was significantly different between the 2 groups (*p*<0.001) (Figure 1). Also according to gender, the frequency of depression increased significantly only in women (*p*<0.001, odds ratio: 6.33, 95% CI: 2.03-19.6 (Figure 2).

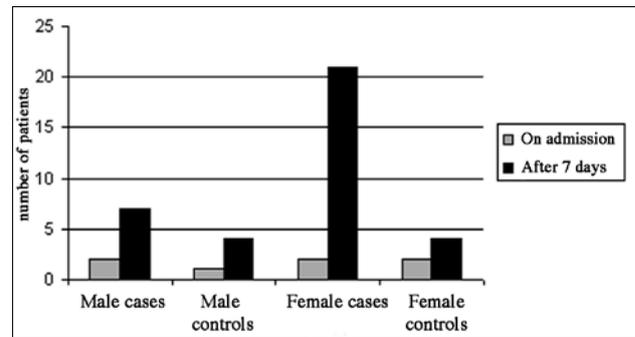
**Discussion.** The prevalence of depression among stroke patients has been reported between 20-65%.<sup>2,3</sup> Depression is a process that begins immediately after cerebral stroke, and tends to progress over the years.<sup>10</sup>

**Table 1** - Demographic characteristic of cases and controls (N=120).

Characteristics	Cases (adjacent to ill patients) n=60	Controls (not adjacent to ill patients) n=60
Age (years)	62.4± 4	63.6±4
Female/male ratio	1.85	1.85
Mean duration of hospitalization (days)	10.2	9.5
History of hypertension (%)	38.3	41.6
Smoking (%)	31.6	28.3
History of hyperlipidemia (%)	23.3	23.3



**Figure 1** - Frequency of depression in case and control groups on admission and after 7 days.



**Figure 2** - Frequency of depression in case and control groups according to gender on admission and after 7 days.

Post stroke depression causes a rise in morbidity and mortality, psychosomatic disability, and non-responsiveness to rehabilitation.<sup>4</sup> This situation affects the patient's family directly or indirectly, and causes further fatigue, depression, and anxiety.<sup>2</sup> Nowadays, more efforts have been made to improve the stroke patients' care and treatment, and the establishment of a stroke unit is one of them. The stroke unit has been established in many countries such as Spain,<sup>11</sup> Portugal,<sup>12</sup> Britain,<sup>13</sup> and Norway.<sup>14</sup> The basic philosophy of the foundation of a stroke unit is providing these patients with special services such as breathing support and consciousness monitoring, and providing special drugs such as thrombolytics.<sup>15,16</sup>

It seems that separation of stroke patients from other patients, which is necessary for all patients,<sup>15</sup> is not enough alone, and other aspects such as patients' care in the hospital should be considered. In our study, the case group showed a higher depression rate on the seventh day of admission (Figure 1). Depression affects the treatment process by its various consequences. Although various factors such as age >75 years, history of previous stroke,<sup>17</sup> and severe physical disability after stroke are involved in developing post stroke depression,<sup>18</sup> it seems that providing an appropriate situation could improve the treatment process. The poor condition of roommates, such as urinary and fecal incontinence, and cardio-pulmonary resuscitation could affect the psychological condition of patients directly, and cause non-reversible consequences, especially when the diagnosis is the same as the patient.

The study results showed that this problem is more frequent among women than men (Figure 2), and women with cerebral stroke admitted adjacent to ill patients are more disposed to depression, although the chance of developing post stroke depression is greater among women.<sup>19</sup> This may be explained by the high sensitivity and emotional sense in women.

We did not assess depression severity and intensity on admission and after 7 days of hospitalization, and this is one of our study limitations. Although we excluded patients with a poor condition from the study, however, using the Beck Depression Inventory has limitations when used in the context of significant physical illness. This may be another limitation of the present study.

Although, we could not find a similar study with which to compare the results, our findings show that the clinical condition of patients should be considered for patient separation and special nursing services, as hospitalization of stroke patients without separation according to the clinical situation may increase the depression rate in these patients. Future prospective studies with longer follow-up period are warranted to investigate the effect of poor condition of roommates during the admission period in developing post stroke depression, and to confirm our results in patients with stroke.

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