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A Survey on 465 Patients With Post-Stroke Depression in China

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A B S T R A C T

The incidence of PSD patients is very high. To analyze the related factors and incidence of post-stroke depression (PSD). A total of 465 stroke patients were evaluated by a self-designed questionnaire, Self-Rating Depression Scale (SDS) and Hamilton Depression Rating Scale (HAMD). The neurologic deficit score was tested using the National Institute of Health stroke scale (NIHSS). A multiple factor analysis with the logistic regression method was carried out to analyze related factors of PSD. A total of 146 cases (31.4%) were identified as suffering from PSD. In addition the stepwise regression analysis showed that important risk factors of PSD included of sex, lesion location, the course of post-stroke and degree of neurological deficit score (all $P < 0.05$). Above mentioned factors about the patients of PSD are very significant and may provide reference for further treating.

Depression is a distressing illness and is associated with a substantial reduction in quality of life and increased risk of suicide (Saarni, Suvisaari, Sintonen, et al., 2007; Teasdale & Engberg, 2001). Post-stroke depression (PSD) is among the most frequent neuropsychiatric consequence of stroke. PSD occurs in at least one third of patients within the first year of stroke onset (Hackett & Anderson, 2005), being associated with significant social and cognitive impairment, poor rehabilitation outcomes and high mortality rates (Starkstein, Mizrahi, & Power, 2008). Depression is a distressing illness and is associated with a substantial reduction in quality of life and increased risk of suicide (Saarni et al., 2007; Teasdale & Engberg, 2001). PSD occurs in up to 50% of all stroke survivors (Robinson, 1998; Wiart, Petit, Joseph, et al., 2000) with prevalence peaking approximately 6 months after the vascular event (Dafaer, Rao, Shareef, et al., 2008). PSD is often inadequately diagnosed and treated, despite an evidence base for effective treatments (Dafaer et al., 2008).

The etiology of the development of PSD is complex and remains incompletely understood. One of the main questions remaining controversial to the current time is the relationship between the location of the focal lesion and the development of post-stroke depression (Gordon & Hubbard, 1997; Neau, Ingrand, Mouille-Brachet, et al., 1998). PSD is believed to arise most frequently when focal lesions are located in the left frontal area or the adjacent basal nuclei. A role for the subcortical ganglia of the right hemisphere has been demonstrated. The development of post-stroke depression correlates with histories of depressive episodes, the extent of functional disorders, age, education, the family situation, gender, and the presence of a history of stroke.

Prospective observations of patients with PSD have shown that affective symptoms persist in the long term if left untreated. Thus, the symptoms of major depression identified in 27% of stroke patients persisted for 1 year, while the symptoms of minor depression seen in 20% of patients persisted for more than 2 years (Morris, Robinson, & Raphael, 1990; Robinson & Price, 1982). In their recent studies of 100 patients for 18 months, Berg, Palomäki, Lehtihalmes, Lönnqvist, and Kaste (2003) showed that depression occurred in 46% of patients within the first 2 months of stroke, while the first symptoms appeared only at 12 months in 12% of patients. The incidence of post-stroke depression among patients admitted for treatment was 40.4%, compared with 37.4% among out-patients 3 years after stroke (Bogolepova, 2003). The incidence of depression was maximal in the late recovery period following is chemic stroke, reaching 72.2%. Post-stroke depression developed more frequently in older patients and those with marked focal neurological lesions. Bogolepova (2003) indicate that risk factors for the development of post-stroke depression in the long-term post-stroke period are being female, being elderly, having a right hemisphere lesion, and having poor recovery of self-care ability. The objective is to evaluate the factors associated with PSD as assessed with the Hamilton Depression Scale (HAMD) and Self-rating depression scale (SDS).

METHOD

Study Population

Four hundred sixty-five patients who first visited the department of Neurology in the Second Affiliated Hospital of Harbin Medical University were enrolled from 1 July 2012 to 31 August 2013. Diagnostic criteria were agreement with the China 4th National Cerebrovascular Meeting's diagnostic criteria for stroke. CT-scan and MRI were used to diagnose the patients finally.

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Other inclusion criteria are: (1) being conscious and no cognitive disorder; (2) being less than 6 months post stroke; (3) being 30 years or older; and (4) having sufficient communication skills.

Exclusion criteria are: (1) co-morbidity that might affect outcome (e.g., cancer or major psychiatric illnesses for which psychological treatment is given at the moment of inclusion); (2) a major depression diagnosis requiring medication; and (3) a pre-morbid major depression diagnosis, or having received psychiatric care for depression.

Measures

The Demographic Data Questionnaire was designed by the researchers and collected information about the gender, age, job category, marital status, education level, history of hypertension, history of diabetes, history of coronary heart disease, stroke classification, side of lesion from the CT report, and course of disease.

The dynamics of depressive disorders were assessed using the Self-Rating Depression Scale (SDS). The depressive disorders were diagnosed if the score was higher than 40. Post-stroke depression was diagnosed in accordance with IDC-10 criteria. The severity of the depressive state was evaluated using the Hamilton Depression Rating Scale (HAMD) (17 items) (Aben, Verhey, Lousberg, Lodder, & Honig, 2002). Mild depression was defined if the score was higher than 7; Moderate depression was defined if the score was higher than 17; severe depression was defined if the score was higher than 24. The questionnaires were finished by two neurologists who were trained 2 weeks before the research. The neurologic deficit score was tested using the National Institute of Health stroke scale (NIHSS). The scale was finished by two neurologists. The two neurologists were trained 2 weeks before the study. An obligatory condition was informed consent from the patient.

Data Analysis

The data were analyzed using SPSS 15.0 software. Descriptive statistics (mean and standard deviation) were used to summarize data. Independent samples t tests were used to compare means for continuous variables with 2 groups, one-way ANOVAs for continuous variables with more than 2 groups and two test for categorical variables. Stepwise multiple regression analysis was used to test the influence of the demographic variables to depression. The differences were considered to be statistically significant if $P < 0.05$.

RESULTS

A total of 465 patients agreed to participate in the study. Demographic data included as following: male 198, female 267; the average age is 65.57 ± 10.16; married 424; unemployed or retirement 336; urban residents 446, rural residents 19; higher educators 26, secondary education and below 439; hypertension 403, diabetes 367, coronary heart disease 122; stroke type: cerebral infarction 385, cerebral hemorrhage 80; diseased location: left hemisphere stroke 118, right hemisphere stroke 127 and bilateral hemisphere stroke 22; course of disease: less than 1 month 320, more than 1 month 145. Neurologic deficit score: mild (0–15), 105; moderate (16–30), 153; severe (31–45), 207.

There were 146 PSD patients, with the female 65 and male 81. The scores of SDS were 50.26 ± 7.65 points. The scores of HAMD were all higher than 7. The scores of HAMD were 15.77 ± 5.45 points. The prevalence of PSD was 31.4%. The single factor analysis for depression is showed in Table 1.

According to the multiple regression analysis, the important risk factors of PSD included of sex, lesion location, the course of post-stroke and degree of neurological deficit score (Table 2).

Table 1
The Single Factor Analysis Between PSD and Non-PSD ($N = 465$).

	PSD (n)	Non-PSD (n)	χ^2	P
Gender			11.87	0.001
Male	65	133		
Female	81	186		
Age			0.801	0.398
≥60	88	180		
<60	58	139		
Job category			0.004	0.955
Be on the job	62	67		
Unemployed and retire	84	252		
Residence			3.016	0.079
City	142	304		
Village	4	15		
Marital status			0.914	0.313
Married	128	296		
Spinsterhood	18	23		
Education level			0.524	0.431
Higher educators	12	14		
Secondary education and below	134	305		
Past medical history				
Hypertension	87	316	3.792	0.062
Diabetes	89	278	3.108	0.091
Coronary heart disease	33	89	3.346	0.068
Stroke history	108	297	3.579	0.068
Stroke type			3.869	0.054
Cerebral infarction	128	257		
Cerebral hemorrhage	18	62		
Diseased location			16.987	0.006
Left hemisphere stroke	60	58		
Right hemisphere stroke	55	72		
Bilateral hemisphere stroke	31	189		
Course of disease			69.892	0.000
Less than 1 month	58	262		
More than 1 month	88	57		
Neurologic deficit score			27.987	0.002
Mild (0–15)	36	69		
Moderate (16–30)	62	91		
Severe (31–45)	48	159		

DISCUSSION

The mean prevalence of PSD has been estimated to be around 30–35%, ranging from 20 to 60% 16. The prevalence of PSD in our study was 31.4%, consistent with some studies in Western countries (Hackett & Anderson, 2005; Paolucci et al., 2005). The mean HAMD score in the patients was 15.77 ± 5.45 points. The HAMD diagnosed mild depression in 58 patients (39.7%) and moderate depression in 78 patients (53%).

Risk factors related to PSD are constitutional (female gender), clinical (previous stroke, previous depressive or psychiatric episode, cognitive impairment or aphasia), functional (severity of disability); environmental (premorbid neurotic personality and social isolation), and biological (family history of depression). Other risk factors such as education level, previous stroke, stroke severity, apathy, denial reaction at the acute stage, and cerebral atrophy have been alternatively found to be associated with PSD (Paolucci et al., 2005; Whyte & Mulsant, 2002). Our data indicate that risk factors for the development of post-stroke depression are being female, having a diseased hemisphere lesion, having longer course of disease and having neurologic deficit (Table 1). The

Table 2
Stepwise Multiple Regression of Predictor Values Explaining Depression.

Variable	B	Beta	t	P
Gender	0.65	0.19	11.74	0.001
Diseased location	0.24	0.07	7.36	0.004
Course of disease	−0.286	0.15	5.09	0.003
Neurologic deficit score	0.05	0.03	5.87	0.015

$R^2 = 0.116$, adjusted $R^2 = 0.215$, $F = 36.508$, $P < 0.0001$.