

# Brief Communication

## Post stroke depression in acute stroke: correlating with site and stroke severity

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Depression is one of the most frequent neuropsychiatric manifestations in acute stroke being present in 6-52% of patients.<sup>1,2</sup> It has been associated with delay in physical and mental recovery leading to increased morbidity. There is a lack of data available regarding depression following acute stroke. One study in a Portuguese cohort<sup>3</sup> suggested that approximately 46% of the patients following acute stroke could suffer from depression. There is currently very limited information available in the Saudi population. The factors leading to depression following acute stroke are not clear. Caeiro et al<sup>3</sup> found prior mood disorders to be a predictor for depression. Some factors such as stroke severity have also been related to post stroke depression (PSD). In addition, the site of the stroke and its association with PSD is not obvious. Some studies found that PSD is more frequent in left sided hemispheric strokes,<sup>4</sup> while others describe it with right sided lesions. A systematic review of patients with first-ever ischemic stroke did not associate depression with any particular acute hemispheric lesion site.<sup>3</sup> In order to further understand this phenomenon in our population, we conducted this study to evaluate the frequency of post acute stroke depression, and correlated it to the location and stroke severity.

A prospective observational study was carried out after obtaining approval from the Institutional Review Board, where we recruited acute stroke patients (<7 days) admitted to the Acute Stroke Unit at King Fahad Medical City, Riyadh, Saudi Arabia between February

2008 and April 2009. We investigated the presence and severity of depression, and correlated it with location subtype and severity of the stroke. Patients with prior history of depression/mood disorder, alcohol abuse, severe aphasia, Glasgow Coma Scale of <10 and previous stroke were excluded. The acute stroke was diagnosed and localized clinically and confirmed by neuroimaging. Disability of stroke was determined by the modified Rankin Scale (mRS). An unfavorable outcome was defined as mRS score of  $\geq 3$  (death or dependency). Presence and severity of depression were assessed by the Hamilton Depression Rating Scale (HDRS), 5-7 days after admission. Depending upon the scoring on HDRS, the patients were diagnosed as mild (score of 10-13), moderate (14-17), and severe (>17) depression. We used chi-square with continuity correction ( $\chi^2$ ) to test bivariate associations between the presence of depression and age (<60 or  $\geq 60$  years), gender, clinical symptoms and signs (aphasia, neglect, hemiparesis), type (intracerebral hemorrhage, infarct) and location (brainstem-cerebellum or hemispherical; hemispherical, left or right; hemispherical, deep or superficial) of stroke and mRS grade at discharge ( $\geq 2$ ). We considered a  $p$ -value  $\leq 0.05$  statistically significant. The Statistical Program for Social Sciences (SPSS Inc., Chicago, IL, USA), version 18 was used to carry out the statistical analyses.

Sixty patients fulfilled the selection criteria, and included 42 men, and 18 women with a mean (+SD) age of 58 (+14) years. Average duration of symptom onset prior to admission was 35 (+33) hours, (range 1-120 hours). Stroke was ischemic in 95% (n=57) and hemorrhagic in 3 patients. Twenty-three patients presented with right hemispheric, 20 with left hemispheric, and 17 with brainstem strokes. Average mRS was 1.8 (+1.4). The characteristics of the stroke are displayed in Table 1. Ten patients (17%) were

**Table 1** • Comparison between depressed and non-depressed Saudi patients with acute stroke.

Variable	Total number (%, n=60)	With depression n=10	No depression n=50	$\chi^2$ (p-value)	Moderate/severe depression, n=3
Age $\geq 60$	30 (50.0)	8	22	0.4800 (0.488)	3
Male/Female	42/18 (70/30)	6/4	36/14	0.5714 (0.450)	2/1
Hemiparesis (+ other)	37 (61.7)	6	31	0.0141 (0.905)	3
Hemiparesis (pure motor)	14 (23.3)	3	11	0.2981 (0.585)	2
Neglect	2 (3.3)	0	2	0.4130 (0.520)	0
Hemisensory (+ other finding)	16 (26.7)	4	12	0.2960 (0.296)	0
Dysarthria $\pm$ dysphagia	20 (33.3)	4	16	0.2400 (0.624)	1
Cerebral infarction	57 (95.0)	10	47	0.6316 (0.427)	3
Intracerebral hemorrhage	3 (5.0)	0	3	0.6316 (0.427)	0
Left hemisphere	20 (33.3)	3	17	0.0600 (0.860)	0
Right hemisphere	23 (38.3)	5	18	0.6910 (0.406)	3
Right/Left hemisphere	23/20	5/3	18/17		3/0
<b>Hemisphere</b>					
Superficial	18 (30.0)	4	14	0.5714 (0.450)	2
Deep	25 (41.7)	4	21	0.0137 (0.907)	1
Brain stem + cerebellar	17 (28.3)	2	15	0.4104 (0.522)	0
Ranking score $\geq 2$	31 (51.7)	8	23	3.8580 (0.0495)	2

found to have depression. Mild depression was seen in 7 patients, moderate in 2, and severe in one patient. All depressed patients had ischemic strokes. Mean mRS was significantly more for depressed patients 2.6 versus 1.7 ( $p=0.0495$ ).

In our study, depression was seen in 17% of acute stroke patients, which is probably a lower frequency in comparison with the Portuguese studies.<sup>3</sup> We speculate this could be related to our exclusion of patients with prior psychiatric illnesses. Also, the depression screening methodology used by Caeiro et al<sup>3</sup> was different and may have higher sensitivity. We also noted that the socio-cultural and education background of our patients may be a factor that can lead to poor insight, and the level of awareness of the patients regarding stroke and its consequences, although these variables were not included in our study. We did not find any definite correlation with stroke site or other variables like gender, age of patients, or the presence of hemiparesis. However, severity of disability was the only significant predictive factor associated with depression. Multiple authors<sup>2,3</sup> reported the association of acute stroke depression with female gender. In our study, we found a higher proportion of depression in females, but this did not reach statistical significance. We did not find a relation between acute depression and site of stroke lesion consistent with the findings of Bhogal et al,<sup>1</sup> and Caeiro et al.<sup>3</sup> Other factors contributing to moderate or severe depression were higher lesion volume.<sup>5</sup>

In conclusion, depression was seen infrequently in our Saudi cohort following acute stroke, and was significantly related to severity of disability, not to

the type or location of the stroke. The present study has some limitations, such as the small sample size of patients, the exclusion of severe aphasic patients, previous mood disorders, and exclusion of socio-cultural and educational background of patients. These may be included in future studies to further understand this phenomenon.

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