



Personality Traits, Depression and Anxiety among Cerebro-vascular Stroke Patients: An Egyptian Study

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Authors' contributions

This work was carried out in collaboration between both authors. Author GAS designed the study, wrote the protocol, performed the statistical analysis, managed the literature search, and wrote the first draft of the manuscript with assistance from author HSH. Author HSH designed the study, wrote the protocol and assessed cases and control. Both authors read and approved the final manuscript

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ABSTRACT

Background: Over the past several decades, the relationship between personality traits, depression, anxiety and stroke has interested to clinicians and researchers.

Objective: Evaluation of personality traits, depression and anxiety among patients with stroke.

Methods: Thirty patients with stroke recruited from neurology department inpatients unit in Assiut university hospital. Another 50 subjects matched with respect to age, sex, and socioeconomic status formed the control group. For each participant, a complete medical history was obtained. Clinical examination, brain CT or MRI, and psychometric evaluation was performed for patients. Eysenck Personality Questionnaire, Hamilton anxiety and Beck Depression Inventory were used in assessment the psychometric state of patients.

Results: Patients with stroke reported significant higher scores in depression and anxiety. Psychoticism, lying and crime personality traits were significant higher among stroke patients compared with controls. Depression, anxiety were significant correlated with some of the personality traits subscales.

Conclusion: In our study stroke is associated with depression, anxiety and some abnormal personality traits.

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1. INTRODUCTION

Stroke is considered as the second leading cause of death in the world, and the main cause of neurological disability in adults [1]. The majority of stroke survivors express residual physical or cognitive deficits [1].

Personality traits are defined as the relatively enduring patterns of thoughts, feelings, and behaviors that distinguish individuals from one another. Personality traits in stroke patients may be preceded by the illness, or secondary to stroke. The difference in personality traits among patients with stroke is due to association with other diseases, age and gender [2]. The interpretation of the personality correlates with stroke remains problematic. Some personality traits might cluster to both heart disease and stroke and, possibly, predisposed to same changes in the personality traits, because both of two diseases had same risk factors [3]. On the other hand, stroke causes brain tissue damage, reduction in the quality of life and other secondary health problems [2,4]. Hence, large changes in personality variables and the onset of other diseases as a consequence of the initial disease could be expected, particularly for stroke patients. In a study by Yousfi et al. [2] they found that only a few numbers of stroke patients reported suffering from stroke alone.

Depression is the most common neuropsychiatric disorder following stroke, with prevalence rates ranging from 11% to 63% [5], depending on the study and methodology [6]. Also, depressive symptoms occurred in 26- 33% of all stroke survivors and anxiety about 36% at any time after stroke[7-9]. This frequency is far greater than that found in the general population. Post-stroke depression (PSD) can have profound negative effects on stroke recovery. It was reported that it worsens cognitive impairment [10], functional impairment and increases mortality rates [11]. It also negatively impacts emotional wellbeing and quality of life [12].

The risk of vascular disease is greater among people with depression, anxiety and worry, and anger and hostility [13].

Among women with suspected myocardial ischemia, anxiety and depression were associated with that disease and also, the two mood dimension scores interacted such that a significant main effect relationship between depression and cardiovascular disease death and events was found to vary across levels of anxiety [8].

Aim of this study was to evaluate prevalence of personality traits, depression and anxiety among patients with stroke.

2. PATIENTS AND METHODS

2.1 Patients

This was a cross-sectional and convenience study, involving 30 patients with stroke who recruited from the neurology department inpatients unit in Assiut University Hospital over a period of 12 months. Clinical diagnosis of cerebro-vascular stroke was made according to World Health Organization (WHO) monitoring of trends and determinants in cardiovascular

disease. Diagnosis was confirmed with an evidence of an acute infarct or hemorrhage on computed tomography (CT) or magnetic resonance imaging (MRI), which was part of the Standard clinical stroke protocol. For the purposes of this study, all patients meeting the following criteria were included: Inclusion criteria for the study were: 1) Egyptian ethnicity; 2) well documented clinical presentation and CT and/or MRI scan of the brain within one month of the occurrence of ischemic or hemorrhagic strokes; 3) ability to give consent or the availability of a relative to give proxy consent to participate in the study; and 4) Age >18 years. Patients with aphasia were excluded, if they had severe speech deficits that impaired the assessment. Patients with an impaired level of consciousness, other acute medical or neurological illness, or a pre-morbid Axis I psychiatric disorder (that detected from chart review, clinical examination and, whenever possible, information provided by family members) were used in order to exclude patients with a prior axis I disorder.

Fifty healthy controls, Egyptian ethnicity, from the relatives of patients matched with respect to age, sex, educational level, and socioeconomic status were included in this study. That control group had no previous history of other cerebro-vascular events such as TIA or previous history of minor stroke or any medical or neuro-psychiatric illness.

Written informed consent was obtained from all participants or their substitute (for illiterate patients) consent givers after discussing a detailed description of the study. The study was approved by the research ethics boards of Assiut university hospitals.

2.2 Clinical and Psychometric Measures

Clinical and medical histories were assessed through meticulous neurological assessment and patient interviews. The assessment of patients was done within one month of the occurrence of ischemic or hemorrhagic strokes. Demographic information included age, gender, and educational history. Concomitant medications and time since stroke were recorded.

A standardized and validated Arabic version [14] of the Beck Depression Inventory was used to assess symptoms of depression [15].

Participants also completed a standardized and validated Arabic version [16] of the Eysenck Personality Inventory [17], which covers neuroticism, psychoticism, extroversion–introversion, lying, and crime. This is the only translated and validated scale that it would be used.

The Hamilton Anxiety Scale lists 14 types of symptom. The total score ranges from 0 to 56. A total score of 18 or more means anxiety [18].

2.3 Assessment of Motor and Functional Disabilities

The degrees of patients' motor and functional disabilities were determined using Scandinavian Stroke Scale (SSS) [19] and Barthel Index (BI). Each takes _10 minutes to administer [20].

2.4 Procedure

The method-used in this study was quasi-experimental. It was equivalent to a naturalistic study (simply describing events as they unfold without study intervention). As, it was based on using natural manipulation of independent variables (personality traits, depression and anxiety in normal and patients with stroke) with no interference on the part of the researchers. Subjects in both the clinical and controlled group had been subjected to the same tests. The procedure was conducted individually by having a researcher and a subject sitting facing each others, which enable the researchers to evaluate the response of patients. The psychometric scales were carried out by the second author who is psychologist. Neurological assessment and examination was carried out by first author.

2.5 Statistical Analysis

Descriptive statistics were calculated using SPSS software package for Windows, Version 16. The data fit normal distribution as presenting the results in an easy to read & understand manner (mean, SD and percentages). Results were analyzed using independent-sample T test that did not assume equal variances. Pearson correlation coefficient was used to examine the impact of the severity of stroke upon personality traits in stroke patients. Also, Pearson correlation coefficient was used to assess the relation between depression and anxiety with personality traits. Significance level was set at $p \leq 0.05$.

3. RESULTS

No significant differences were detected between stroke patients and control as regard age, sex, education, socioeconomic state, and handedness as in (Table 1). There was significant affection of depression, anxiety or personality traits as psychoticism, lying or crime among stroke patients than control group (Table 2). Pearson correlations were done between personality traits, severity of stroke, depression and anxiety. As increased the severity of stroke, increased depression. In addition, positive correlation was found between some personality traits and the severity of stroke, depression or anxiety (Tables 3 and 4).

Table 1. Demographic data of studied group

	Stroke patients N=30	Control N=50	P value
Sex			
• Males	10(33.3%)	16(32.0%)	1.000
• Females	20 (66.7%)	34(68.0%)	
Education			0.267
• Illiterates	25(83.3%)	41(82.0%)	
• Primary schools	1(3.3%)	0(.0%)	
• Prep schools	0(.0%)	4(8.0%)	
• Secondary schools	2(6.7%)	4(8.0%)	
• University	2(6.7%)	1(2.0%)	
Handiness			
• Right	28(93.3%)	50(100.0%)	0.138
• Left	2(6.7%)	0(.0%)	
Age (mean \pm S.D)	56.07 \pm 15.514	51.380 \pm 9.83	0.145

Unless indicated data were expressed as number and percent

Table 2. Personality traits, depression and anxiety among studied group

	Stroke patients N=30	Control N=50	P value
Personality traits			
• Neuroticism	10.23±2.39	9.32±3.46	0.207
• Extroversion	10.73±3.02	10.02±3.75	0.380
• Psychoticism	13.43±3.09	11.94±2.698	0.033
• Lying	10.53±1.89	9.08±3.08	0.011
• Crime	17.73±3.04	15.48±4.315	0.008
Beck Depression Inventory	14.60±9.52	8.90±6.497	0.006
Hamilton anxiety score	27.93±7.75	22.72±4.789	0.002

Data was expressed as mean±S.D

Table 3. Correlation between the severity of stroke and personality traits, depression and anxiety

	Scandanavian stroke	Barthel stroke
Personality traits		
• Neuroticism	• 0.106(0.349)	• 0.117(0.303)
• Extroversion	• 0.035(0.755)	• -0.010(0.928)
• Psychoticism	• 0.121(0.287)	• 0.058(0.610)
• Lying	• 0.254*(0.023)	• 0.261*(0.020)
• Crime	• 0.242*(0.031)	• 0.138(0.222)
Beck Depression Inventory	-0.367*(0.046)	-0.160 (0.397)
Hamilton anxiety score	0.253(0.178)	0.166(0.382)

Pearson coefficient was used *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed)

Table 4. Correlation between personality traits, depression and anxiety

Anxiety	Depression	Personality traits
0.029(0.796)	0.259*(0.020)	Neuroticism
0.216(0.054)	0.443**(0.000)	Extroversion
0.011(0.926)	0.455**(0.000)	Psychoticism
-0.081 (0.476)	-0.216 (0.054)	Lying
0.229*(0.041)	0.382**(0.000)	Crime

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed)

4. DISCUSSION

The relationship between personality traits and heart disease has interested clinicians and researchers over the years, but to our knowledge studies on stroke patients were lacking. This cross-sectional study supported those personality traits changes may be secondary to the occurrence of the stroke among patients with stroke. Psychoticism, lying and crime personality traits were significantly higher among stroke patients than control group. That can be explained by the fact that stroke can cause brain tissue damage, reduction in the quality of life and other secondary health problems. Hence, large changes in personality variables and the onset of other diseases as a consequence of the initial disease could be

expected particularly for stroke patients. In addition, stresses related to symptoms and management of chronic medical conditions such as loss of wellbeing, financial strains, change in self-image, loss of autonomy, and complicated interactions with healthcare providers [21] can also contribute to the changes in the personality traits. These changes in personality traits were similar to the changes that may occur among patients with cardiovascular disease [21], as they share the same risk factors and can lead to one another. We found that patients with acute ischemic stroke had significant higher scores of depressive symptoms and anxiety than matched control groups.

With regards the Hamilton Anxiety scale, ≥ 18 actually suggested the “presence of clinically significant levels of somatic or psychic anxiety”. It was very interesting finding in our study that patients and control groups had (28 versus 23) which were within the pathological range. We think, that the stress factors in Egypt could make most of people anxious even who not diseased. Also, the control group was chosen from relatives of disease patients and that may reflect anxiety upon them. The significant difference in anxiety scale was consistent with the findings of other acute hospital-based studies [12,22]. Post stroke depression is an important topic, as it will potentially affect the ever-increasing number of stroke survivors [23]. On the other hand findings suggested that post-stroke anxiety problems were common, and both more stable and persistent than post-stroke depression [24]. It was reported that stroke caused depression through a direct biological mechanism [23]. Researchers had split into two camps as regards to biological mechanism according to which ischemic insults directly affect neural circuits involved in mood regulation [25]. The psychosocial mechanism are added social and psychological stressors associated with stroke [23].

Bergersen and colleague [9], reported that 17% of their post-stroke patients suffered from either anxiety or depression. However, each syndrome was not homogeneous but rather, 50% of those with primary depression also suffered from anxiety and conversely, two thirds of those diagnosed with anxiety also suffered from depression. This possibly indicated that the Hamilton Anxiety Scale (HAD) scores reflect a general psychological distress [26]. This could be considered to be in accordance with an earlier Norwegian study of the general population, where somatic health problems were more strongly associated with coexisting anxiety and depression than with anxiety or depression each alone [9]. An explanation of this might be, in accordance with Williams and Evans [27], that somatic illness contributes to an increased load of stressors that cause clinically significant depression in diseased persons. For whatever reason, it seemed that the complex situation in the stroke population needs to be assessed as a whole [9].

Prospective associations between anger dimensions, as part of personality traits and incident cerebrovascular disease might be mediated, in part, by increased atherosclerotic disease [28]. In this study, there were significant correlations between personality traits and depression as neuroticism, extroversion, psychoticism and crime. In addition, significant correlation was found between crime and anxiety as well. Personality traits could influence individual's responses to the onset of physical illness. Extroverted patients might be more active in their approach to rehabilitation, follow-up care and risk factor modification than introverted patients [29]. Personality traits in stroke patients helped in detection of post stroke depression. The neuroticism was a vulnerability factor for depression in the first year after a first-ever cerebral infarct. For each 1-point increased in neuroticism, the risk of depression increased by a factor of 1.08 [30]. On the other hand, stroke should also be considered a negative life event to which patients may respond with depression, depending on the interaction between personality factors and the severity of the negative physical, psychological, and social consequences of stroke [31]. In addition, stroke showed the largest

mean differences with respect to type a behavior, too. This effect remained statistically significant even after controlling for other diseases, age and gender. Again, the low magnitude of the corresponding semi-partial correlation and significance level was a consequence of the low prevalence of stroke [2].

Significant correlations were found between the severity of stroke and some personality traits (lying and crime), also with depression. Post stroke depression was known to be related to dependence in activities of daily living (ADL) and to the severity of neurological deficits [32]. The relationship between motor disability and motor rehabilitation with depression in our study showed significant association between the depression and the degree of neurological and functional deficit measured by Scandanavian stroke scale and Barthel Index, similar to finding of Kauhanen et al. [33] and Pohjasvaara et al. [34]. They found that, the depressed patients were more dependent in daily life activities as measured by the Barthel Index and were more severely handicapped as measured by the Scandanavian stroke scale.

5. CONCLUSION

Our results showed that personality traits, anxiety and depression are prevalent after stroke. Significant correlations were found between personality traits, anxiety and depression with stroke. The increase in the severity of stroke led to more impairment of personality traits, anxiety and depression.

6. LIMITATION OF STUDY

This study included small number of patients (30). That was returned as we conducted this study within one year only. In addition, we conducted that study within one month from the onset of stroke and that was costly upon the hospital as it done in inpatient units which was free.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties).

ETHICAL APPROVAL

All authors declare that all patients and control groups have been examined and approved by the local ethical committee of Assiut University, faculties of Medicine and Art approved the study. This study was in agreement with Helsinki declaration research ethics.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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