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CLINICAL FEATURES AND RISK FACTORS OF ACUTE STROKE IN WOMEN

By

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ABSTRACT

Background: There is growing recognition of the clinical and public health importance of stroke in women. Moreover, stroke-related outcomes, including disability and quality of life are consistently poorer in women than in men. Yet the reasons for this are not well understood. **Objectives:** The aim of this study was to identify risk factors, clinical severity, type, site and size of stroke among sample of Egyptian women patients with acute stroke. **Subjects and Methods:** The study evaluated 103 female patients with acute stroke admitted within 48 hours of stroke onset. All patients were subjected to full history and neurological examination. The stroke severity was assessed on presentation using National Institutes of Health Stroke Scale (NIHSS). Also, computer topography and magnetic resonance imaging brain, bilateral carotid duplex study and trans-thoracic echocardiography study were done to all patients. **Results:** The mean age of the patients was 62.16 ± 13.5 years. Hypertension was the highest family (48.5%) and past history (78.6%) among the study patients. The mean of NIHSS score of our study patients on admission was 6.5 ± 3.76. The past history of previous cerebral stroke insult, high erythrocyte sedimentation rate and abnormal glycosylated hemoglobin were significantly associated with more severe stroke. Large artery atherosclerosis was the most common ischemic etiology in our sample (38.3%). Parietal lesions was the most common stroke site affected in our study patients (26 patients = 25.2%) followed by frontal lesions (18 patients =17.5%). **Conclusion:** Understanding acute stroke among females will help neurologist to develop sex-specific interventions that improve post-stroke recovery for women and reduce their excess burden of disability.

Keywords: risk factors, outcome, acute stroke, women.

INTRODUCTION

Stroke now ranks as the second leading cause of death and the first cause of morbidity all over the world. In the United States, more than half (53.5%) of the estimated 795, 000 new or recurrent strokes occur among women annually, resulting in about 55, 000 more stroke events in women than men (Go et al., 2013).

Males have a higher incidence of strokes, but the absolute burden of stroke is greater in females. Younger women have unique risks during their child bearing years because of pregnancy, preeclampsia, and the use of oral contraceptives. Risk factors which are unique to women are reproductive factors, and those that are more common in women, including migraine with aura, obesity, metabolic syndrome, and atrial fibrillation. Early identification of stroke risk in women will help to minimize the effect of the stroke epidemic in older women (Tang et al., 2009 and Go et al., 2013).

The large majority of epidemiological data available focus only on western countries. A better knowledge of stroke patients characteristics in Middle East and African communities will help to promote tailored campaigns by health care authorities and medical societies (Abdulghani & Etribi, 2003 and Fawi et al., 2009). Based on the aforementioned observations, we sought to determine risk factors, clinical severity, type, site and size of stroke among sample of Egyptian women patients with acute stroke.

The present study was a trial to identify the risk factors, clinical severity, type, site, and size of stroke among sample of Egyptian women patients with acute stroke.

PATIENTS AND METHODS

This is a cross sectional study done on 103 female patients with acute stroke admitted within first 48 to Neurology Department and Stroke unit at Ain Shams Specialized University Hospital over one year from the beginning of may, 2013 to the end of april, 2014. This study included female patients admitted with all ischemic (whether arterial or venous) and hemorrhagic strokes. Patients admitted with weakness due to a cause rather than cerebrovascular stroke or transient ischemic cerebral attacks were excluded. All patients or legal guardians provided written informed consent prior to participation in this study.

A detailed medical history, and full clinical general and neurological examination were carried out in all patients considering the National Institutes of Health Stroke Scale (NIHSS) score on admission. Full laboratory investigations, computer topography (CT) brain scan and 1.5 Tesla magnetic resonance imaging (MRI) brain stroke protocol were done within 48 hours of onset. The size of the stroke was classified as large, small, or very small when the longest diameter of the lesion was > 1.5 cm, 0.5-1.5 cm, or < 0.5 cm, respectively (Kim et al., 2013). Echocardiography was carried out to assess different cardiac abnormalities. Carotid duplex was performed for identification of significant stenosis of the extracranial carotid vessels, i.e. defined as > 50 % stenosis (Tan et al., 2005). Strokes were clinically defined as a sudden onset of a focal neurological deficit of a presumed vascular etiology and lasting more than 24 hours. Transient ischemic attacks are a brief episode of neurological dysfunction caused by focal brain, with clinical symptoms typically lasting less than one hour. Ischemic strokes were classified according to the trial of ORG 10172 in acute stroke therapy criteria (TOAST) etiological classification into patients with large artery atherosclerosis, patients with small artery disease, patients with cardio-embolic strokes, patients with undetermined, and patients with other determined etiology. Hemorrhagic strokes were classified as intracerebral hemorrhages ICH" or subarachnoid hemorrhages "SH" (Easton et al., 2009).

In this study, the stroke severity was assessed on presentation using NIHSS which was used in most clinical trials**.** The maximum possible score was 42, with the minimum score being a 0. To analyze NIHSS results, we divided the patients into three groups according to this baseline NIHSS score: mild (0-7), moderate (8-14), and severe (15 and above) (Saposnik et al., 2011).

Statistical analysis was done using SPSS v19 IBM statistical package for social science and Microsoft office 2010 products (word & excel). 52 variables were subjected to analysis 16 out of them were scale variables & the others were categorical variables. The scale variables were analyzed for normality using Kolmogorov-Smirnov test and were found all not normally distributed. The significance level was set at $P < 0.05$. The categorical data were subjected to descriptive analysis using frequency and percentage while for the scale data mean and standard deviation (SD) was used.

Predictors of having carotid duplex stenosis and having cardioembolic stroke were analyzed in logistic regression models.

RESULTS

This study included 103 female patients. The age of the patients ranged from 17 to 86 years old with a mean age of 62.16 ± 13.5 years. Hypertension was the highest positive family history among our study patients (50 patients = 48.5%) followed by diabetes mellitus (47 patients = 45.6%), then cerebrovascular stroke (CVS) or transient ischemic attack (TIA) (31 patients =30.1%). Hypertension was also the highest past history among our study patients (81 patients =78.6%), followed by past history of diabetes mellitus (64 Patients = 62.1%). The distribution of risk factors among the study population showed that 50 patients (48.5%) had more than 3 risk factors (Table 1). The mean of NIHSS score of our study patients on admission was 6.5 ± 3.76 (Table 2). There were 77 patients (74.8%) had mild to moderate strokes (NIHSS score less than 15) and 26 patients (25.2%) had severe strokes (NIHSS score 15 or more).

Table (1): Distribution of significant family and past history among study patients.

Family history Variable		**Number**	**%**
One or more significant family history of risk factors		73	70.8%
Hypertension		50	48.5%
Diabetes mellitus		47	45.6%
Cerebrovascular stroke or transient ischemic attack		31	30.1%
Significant cardiac disease		21	20.4%
Dyslipidimia		7	6.8%
Past history Variable		**Number**	**%**
Hypertension		81	78.6%
Diabetes mellitus		64	62.1%
Significant Cardiac disease	Ischemic heart diseases 16 (40%)	40	38.8%
	Rheumatic heart disease 14 (35%)		
	Atrial Fibrillation 10 (25%)		
Previous cerebral vascular insults		23	22.3%
Dyslipidemia		16	15.5%

Abnormally high glycosylated hemoglobin (HbA1c) was the highest laboratory risk factor among our study patients as about 60 patients (58.3%) had abnormally high HbA1c. This was followed by patients who had abnormally high ESR (59 patients =57.3%), then patients who had abnormally high serum LDL cholesterol and triacylglycerol (each of them was 37 patients =35.9%), and lastly patients who had abnormal uric acid (16 patients= 15.5% - Table 2).

Based on transthoracic echocardiography findings, dilated left atrial diameter (more than 40 mm) occurred in 24 patients = 23.3% and valve lesions in 23 patients = 22.3 %. These were the most common abnormal findings among our study patients, followed by significant segmental wall motion abnormalities (5 patients =4.9%).

Table (2): Clinical stroke severity and laboratory findings among study patients.

Stroke severity	**Number of patients (%)**	**Mean ± SD**
NIHSS score on admission	103 (100%)	6.5 ± 3.76
Laboratory findings	**Number of patients with abnormalities (%)**	**Mean ± SD**
Glycosylated hemoglobin (HbA1c)	60 (58.3%)	8.2 ± 6.1
Erythrocyte Sedimentation Rate	59 (57.3%)	29.8 ± 21.3
LDL cholesterol	37 (35.9%)	121.44 ± 41.7
Triacylglycerol	37 (35.9%)	147.9 ± 80.09
Uric acid	16 (15.5%)	5.2 ± 2.1

Based on MRI brain findings, the most common stroke subtype among the study patients was ischemic stroke (94 patients =91.3%), followed by sinus thrombosis (4 patients = 3.9%), then TIA (3 patients = 2.9%), and finally hemorrhagic stroke (2 patients =1.9%). All were intracerebral hemorrhage with no subaracnoid hemorrhage. Also, there were 21 patients among our study patients (20.4%) suffering from old silent infarcts.

According to trial of org 10172 in acute stroke treatment (TOAST) etiological classification**,** our 94 ischemic stroke patients (91.3%) were classified into 36 patients (38.3%) with large artery atherosclerosis which was the most common etiology, followed by 32 patients (34%) with small artery disease, then 14 patients (14.9%) with cardioembolic strokes, and lastly 12 patients (12.8%)

with undetermined etiology (table. 3). Among those 94 ischemic stroke patients (91.3%), small infarcts were the most common infarct size (54 patients = 57.4%), followed by very small infarcts (32 patients = 34%), and finally large infarcts (8 patients = 8.6% - Table 3).

Table (3): TOAST classification and size of infarctions among our study patients with ischemic stroke**.**

TOAST* classification	**Number = 94 patients**	**%**
Large artery atherosclerosis	36	38.3%
Small artery disease	32	34%
Cardioembolic	143	14.9%
Undetermined etiology	12	12.8%
Size of infarctions	**Number = 94 patients**	**%**
Small infarctions	54	57.4%
Very small infarctions	32	34%
Large infarctions	8	8.6%

* Trial of ORG 10172 in Acute Stroke Therapy.

Parietal lesions were the most common stroke site affected in our study (26 patients = 25.2%), frontal lesions (18 patients =17.5%), periventricular lesions (13 patients =12.6%). temporal, capsular and brain stem lesions (each of them was 11 patients =10.7%), lesions in basal ganglia (BG) and insula (each of them was 10 patients = 9.7%), and thalamic lesions (8 patients = 7.8% -Table 4).

Regarding brain MRA, the most common intracranial vessel pathology among our study patients was diffuse atherosclerosis (45 patients = 43.7 %), followed by stenosis of main stem vessel (35 patients =34%) then occlusion of main stem vessel (17 patients =16.5%), and only 6 patients (5.8%) had normal intracranial vessels. Thus about 94.2 % (97 patients) of study patients had intracranial vessel pathology while 6.8 % (7 patients) only had extracranial significant carotid artery stenosis (> 50%).

Regarding personal risk factors as predictors to stroke severity, the mean NIHSS score on admission (8.6 ± 4.1) in patients aged 65 years old or more was higher than the mean NIHSS score in patients aged less than 65 years old. Yet, there was no statistical significant difference as regard other personal risk factors (including smoking, using hormonal contraception and menopause).

Past history of previous cerebral stroke insult was the most significant past history

risk factor predictor (23 patients, mean NIHSS score = 8.03±3.6). Yet, there was no other statistically significant differences as regard mean NIHSS score on admission between patients with past history of diabetes mellitus, hypertension, significant cardiac disease, dyslipidimia and patients without those risk factors (Table 5). Regarding other stroke predictors, the patients with high serum level of LDL cholesterol, high ESR, high HBA1C, significant extracranial carotid stenosis (> 50%) showed significant high stroke severity as measured by NIHSS score more than other patients (Table 6).

According to TOAST classification, patients who had large artery athero-sclerosis (n = 36) showed the highest mean NIHSS score on admission (8.6±3.5) followed by patients who had cardioembolic stroke (n=14 - 7.21 ± 3.6), and finally the patients who had small artery disease (n=32) showed the lowest mean NIHSS score on admission (6.9 ± 2.8). However, there was no significant difference between them (p = 0.8). Meanwhile, patients with large infarction (n = 8 - 11.25 ± 3.7) showed significant severe stroke severity as measured by INHSS score in comparison to patients with small (n = 54 - 6.63 ± 3.6) or very small stroke infarction size (n = 32 - 5.18 ± 2.8 - p = 0.01 - Table 7).

Our study also showed that the presence of significant extracranial carotid stenosis (7 patients = 6.8%) was associated with a more severe stroke with a higher mean NIHSS score on admission (9.86 ± 3.02) than the mean NIHSS score (7.05 ± 2.2) among patients who had intracranial vessel pathology (97 patients = 94.2%).

Table (4): Site of the lesions in MRI brain in our study patients.

Site	Number of patients	%
Parietal lesions	26	25.2%
Frontal lesions	18	17.5%
Periventricular lesions	13	12.6%
Temporal lesions	11	10.7%
Capsular lesions	11	10.7%
Brain stem lesions Midbrain lesions Pontine lesions Medullary lesions	11 0 8 3	10.7% 0% 7.8% 2.9%
Lesions in Basal Ganglia BG	10	9.7%
Insular lesions	10	9.7%
Thalamic lesions	8	7.8%
Watershed lesions	7	6.8%
Occipital lesions	6	5.8%
Cerebellum lesions	1	1%
Callosal area lesions	1	1%

Table (5): Family history (FH) and past history (PH) risk factors as predictors to stroke severity.

Mean NIHSS Score / History	Mean NIHSS* score on admission in patients with positive FH† or PH‡	Mean NIHSS score on admission in patients with negative FH or PH	P-value
FH of diabetes mellitus (47 patients - 45.6%)	6.7 ± 4.07	6.2 ± 3.5	0.5 NS§
FH of hypertension (50 patients - 48.5%)	6 ± 3.9	6.98 ± 3.5	0.1 NS
FH of previous cerebrovascular stroke (31 patients - 30.1 %)	7.45 ± 4.2	6.1 ± 3.4	0.09 NS
PH of diabetes mellitus (64 patients - 62.1%)	6.7 ± 3.7	6.1 ± 3.8	0.4 NS
PH of hypertension (81 patients - 78.6%)	6.6 ± 3.9	6.1 ± 2.9	0.6 NS
PH of previous cerebral vascular insults (23 patients - 22.3%)	8.03 ± 3.6	6.2 ± 3.8	<0.05 S‖
PH of dyslipidemia (16 patients - 15.5)%	6.75 ± 5.1	6.46 ± 3.5	0.7 NS
PH of significant cardiac disease (rheumatic heart or ischemic heart or AF) (40 patients - 38.8%)	6.2 ± 3.8	6.6 ± 3.7	0.5 NS

***** National institute of health stroke, † Family history, ‡ Past history, § Not significant, ‖ Significant.

Table (6): Laboratory characteristics, significant carotid duplex findings as predictors to stroke severity.

NIHSS Score / Laboratory findings	Mean NIHSS* score on admission in patients with abnormality	Mean NIHSS score on admission in patients with no abnormality	P-value
LDL cholesterol	(37 patients - 35.9%) 8.2 ± 3.8	(66 patients - 64.1%) 6.5 ± 3.4	0.02 S†
Triacylglycerol	(37 patients - 35.9%) 7.19 ± 4.1	66 patients - 64.1%) 6.1 ± 3.5	0.1 NS
Glycosylated hemoglobin (HbA1c)	(60 patients - 58.3%) 7.93 ± 3.9	(43 patients - 41.7%) 5.9 ± 3.3	< 0.05 S
Erythrocyte sedimentation rate (ESR)	(59 patients - 57.3%) 7.2 ± 3.8	(44 patients - 42.7%) 5.5 ± 3.4	0.02 S
Uric acid	(16 patients - 15.5%) 5.5 ± 3.7	(87 patients - 84.5%) 6.6 ± 3.7	0.2 NS‡
Carotid duplex findings	**Mean NIHSS score on admission in patients with stenosis greater than 50% (7 patients - 6.8%)**	**Mean NIHSS score on admission in patients with no significant stenosis (96 patients - 93.2%)**	**P-value**
Extracranial carotid arteries stenosis	9.86 ± 3.02	6.26 ± 3.7	0.01 S

* National institute of health stroke scale, Significant, ‡ Not significant.

Table (7): MRI brain characteristics as predictors to stroke severity.

According to TOAST* classification	**Mean NIHSS† score on admission**
Patients with large artery atherosclerosis (36 patients - 38.2%)	8.6 ± 3.5
Patients with cardioembolic strokes (14 patients - 14.8%)	7.21 ± 3.6
Patients with small artery disease (32 patients - 35%)	6.9 ± 2.8
P value	0.8 (NS‡)
Size of the lesions	**Mean NIHSS score on admission**
Large infarcts (8 patients - 8%)	11.25 ± 3.7
Small infarcts (54 patients - 57.4%)	6.63 ± 3.6
Very small infarcts (32 patients - 34%)	5.18 ± 2.8
P value	0.01 (S§)

***** Trial of ORG 10172 in Acute Stroke Therapy, **†** National institute of health stroke scale, ‡ No significant difference between the three categories of TOAST, **§** Significant difference between patients with large infarcts and patients with small and very small infarcts as regard mean NIHSS score.

DISCUSSION

Several studies have shown gender differences in risk factor profile. There is an increasing evidence that gender not only influences stroke presentation and severity, but also the choice and response to therapy (Watila et al., 2010 and Gall et al., 2012).

The age of the patients in our study ranged from 17 to 86 years old with a mean age of 62.16 ± 13.5 years which is within the age group of susceptible population in Egypt, i.e. 16 to 90 years with mean of 57.74±12.9 (Abdulghani & Etribi, 2009 and Maeda et al., 2014). Watila et al. (2010) stated that there is no statistically significant difference between mean age for male and female. There was 4 smoker patients (3.9%) and all of them were presented by ischemic stroke which is consistent with other studies (Petrea et al., 2009; Watila et al., 2010 and Gall et al., 2012). Females in our environment are less likely to indulge in these social habits, as it is considered culturally unacceptable.

There was 31 patients (30.1%) in our study had family history of CVS or TIA whereas Fawi and his colleagues (2009) stated that only 6 patients (2 %) of females (n=208) had positive family history of CVS or TIA. Among our study, the most prevalent risk factors were hypertension in 81 patients (78.6%) and diabetes mellitus in 64 patients (62.1%), followed by significant cardiac disease in 40 patients (41.7%), and previous cerebral vascular insults in 23 patients (22.3%). Similarly, Shoaeb and his Colleagues (2014) stated that hypertension found in 57.5% of patients, diabetes mellitus in 51.8%, cardiac diseases in 41.3% and TIAs in 23.6 of acute stroke patients.

Our study showed that 40 patients (38.8%) suffered from significant cardiac diseases and the commonest was ischemic

heart diseases (16 patients = 15.5%), followed by rheumatic heart disease (14 patients =13.6%), and lastly AF (10 patients =9.7%). This also was consistent with the European studies (Petrea et al., 2009 and Watila et al., 2010). Regarding gender differences, Fawi and his Colleagues (2009) had found that ischemic heart disease is reported to be more in males (55%) than females (45%). However, females at age group < 40 years were more affected than males**.**

Also, 44 patients (42.7%) had recurrent stroke, 22.3% with previous cerebral vascular insult, and 20.4% with silent infarcts. This was close to the findings reported by Abdulghani and Etribi (2003) who studied the epidemiology of stroke in Egypt, and stated that percentage of patients with history of previous stroke attacks was 34.9 %. Moreover, Fawi and his Colleagues (2009) reported that history of recurrent strokes was reported to be more in males (65%) than females (35%).

The mean range of NIHSS score of our patients on admission was 6.5 ± 3.76**.** Petrea et al. (2009) reported higher mean score of NIHSS among females than males. On the other hand, Forster et al. (2009) and Petrea et al. (2009) showed no gender differences in stroke severity. This contradiction could be due to the difference in the number in patients in the different studies,

Also, in our study, significant extracranial carotid arteries stenosis (.> 50%) was found only in 7 patients (6.8 %). while about 94.2 % of study patients had intracranial vessel pathology. Quite similar findings were also reported by Wong et al. (1998). The higher prevalence of intracranial vessel pathology in our study may be attributed to that we counted significant diffuse atherosclerosis as intracranial vessel pathology not only the stenosis and occlusion of main stem vessel. Similar findings are recorded by Go et al. (2013). Moreover, Shoaeb and his Colleagues (2014) stated that there is higher prevalence of intracranial stenosis among the Egyptian population than extracranial stenosis. Regarding gender differences, Caplan and his Colleagues (1986) reported that there is a relative female preponderance for intracranial disease that is in striking contrast to the male preponderance of extracranial disease.

Among our 94 ischemic stroke patients (91.3%), large artery atherosclerosis was the most frequent etiology of stroke (36 patients=38.2%), followed by patients with small artery disease (32 patients =35%) and cardioembolic strokes (14 patients =14.8%). Petrea et al. (2009) and Gall et al. (2012) reported that cardioembolism was the most frequent etiology of stroke (25.6%), followed by large-artery atherosclerosis (20.9%). This difference may be explained by lower number of patients in our study who had significant cardiac diseases (40 patients = 38.8%). Moreover, Taher et al. (2010) stated that cardioembolic stroke is more common in women, while large vessel and small vessel strokes are proportionally more common in men.

Among our study, patients of parietal lesions were the most common site affected (26 patients = 25.2%), followed by frontal lesions (18 patients =17.5%), and then periventricular lesions (13 patients = 12.6%). This was followed by

temporal, capsular and brain stem lesions (each of them was 11 patients =10.7%), and lastly lesions in basal ganglia (BG) and insula (each of them was 10 patients =9.7%) and thalamic lesions was (8 patients =7.8%). This was consistent with other study which concluded that lesion locations and stroke types were much more supratentorial strokes (335 patients) than infratentorial strokes (61 patients) (Lewis et al., 1996).

Moreover, patients aged 65 years old or more showed more severe stroke than other patients. Similarly, Taher et al. (2010) stated that old age and female sex were the independent predictor of poor outcome. This may be explained by that vascular risk factors exacerbate with aging. Meanwhile, patients with high serum LDL cholesterol had significant higher mean NIHSS score on admission (8.2 ± 3.8) in comparison to patients who had normal LDL cholesterol (6.5 ± 3.4). Similar findings were reported by Watila et al. (2010) and Go et al. (2013). Patients who had abnormally high erythrocyte sedimentation rate had significantly higher mean NIHSS score on admission (7.2 ± 3.8). This was consistent with the studies of Petrea et al. (2009) and Gall et al. (2012) who stated that cer*e*bral ischemia initiates an inflammatory response in the brain and periphery.

Significant extracranial carotid stenosis (> 50 %) was associated with more severe stroke in the present study. This was similar to the findings reported by Go and his Colleagues (2013) who stated that most of strokes in the territory of the symptomatic artery were disabling or fatal.

Our study showed no significant correlation between stroke severity measured by NIHSS score on admission and the number of risk factors including family and past history risk factors, laboratory and radiological risk factors. This was not consistent with the study of Andersen and his colleagues (2009) which showed that patients who had more than one risk factor had more severe strokes, and had higher mortality rates. This contradiction could be due to the small sample in our study.

CONCLUSION

Gender differences existed in risk factors, clinical severity, type, site and size of stroke among our female patients with acute stroke. This raised the question of whether gender differences in acute stroke deserve the development of women specific stroke risk scores and tailoring interventions for preventing stroke occurrence and recurrence in women.

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قسم الأمراض العصبية و النفسية - كلية الطب - جامعة عين شمس

خلفية البحث: تشير البيانات المتاحة إلى أن عبء السكتة الدماغية لدى النساء غالبا ما يتم اساءة تقديره في كثير من الأحيان في حين أنها تعد مشكلة صحية رئيسية . الهدف من البحث: تحديد خصائص السكتة الدماغية الحادة في عينة من النساء المصريات مع التركيز بوجه خاص على المسببات وعوامل الخطر، الصورة السريرية، ونوع ومكان وحجم السكتة الدماغية.

المرضى وطرق البحث: أجريت هذه الدراسة من خلال دراسة مقطعية أجريت على 103 سيدة ممن يعانين من السكتة الدماغية الحادة (إقفارية كانت أو نزفية) وكانت تلك المريضات محجوزات في وحدة الأوعية الدماغية بمستشفي عين شمس التخصصي خلال48 ساعة من حدوث السكتة الدماغية وقد كان ذلك على مدار عام. وقد أجرى فحصا سريريا بالإضافة إلي متدرج السكتة الدماغية للمركز القومي للصحة وذلك لتقييم الشدة الإكلينيكية عند حجز المريض و عند خروجه من المستشفى. كما أجرى التصوير بالرنين المغناطيسي للدماغ والأوعية الدماغية خلال 48 ساعة من السكتة الدماغية و فحوصات معملية كاملة.

النتائج: أظهرت نتائج الدراسة أن عمرالمريضات في مجموعة الدراسة كانت ضمن الفئة العمرية الأكثر عرضة من السكان فى مصر. وقد كان من عوامل الخطر الأكثر إنتشارا بين هؤلاء المرضى إرتفاع ضغط الدم وتاريخ مرضى للسكته الدماغية لدى العائلة و داء السكري، و يليه أمراض القلب والسكتات الدماغية السابقة، ثم إرتفاع الدهون بالدم . وقد كانت 91.3٪ من المريضات تعانين من السكتة الدماغية الناتجة عن إنسداد الشرايين ' بينما 1.9٪ من المريضات تعانين من نزيف داخل المخ. أيضا كان هناك 3.9٪ من المريضات تعانين من تخثر بأوردة المخ.

الإستنتاج: ضرورة العلاج الدقيق والمتابعة المستمرة للسيدات اللاتى تعانين من إرتفاع ضغط الدم، وإرتفاع نسبة السكر بالدم، أو كوليستيرول الدم، أو لديهن إضطراب فى ذبذبة القلب، أو عيوب صمامات القلب أو ضيق بشرايين الرقبة، وذلك حيث انهن أكثر من غيرهن عرضة للإصابة بالسكتة الدماغية، وبالتالى يمكننا الإقلال من نسبة حدوث السكتة الدماغية لدى السيدات بهذه الطريقة. أيضا ضرورة المتابعة الدقيقة بوحدة العناية المركزة لبعض السيدات اللاتى أصبن بالسكتة الدماغية وكانت أعمارهن تزيد عن 65 عاما أو لديهن إرتفاعا فى ضغط الدم، وإرتفاع فى نسبة السكر بالدم، أو كوليستيرول الدم، أو لديهن إضطرابا فى ذبذبة القلب أو ضيق بشرايين الرقبة وذلك حيث أنهن أكثر من غيرهن عرضة لتدهور الحالة الإكلينيكية عقب الإصابة بالسكتة الدماغية.