

Original Article

Evaluation of Predisposing Risk Factors Among Patients with Cerebrovascular Accidents (Strokes) At Al- Bayda Medical Center

Fathia Hussien^{ID}, Aisha Muhammed

Department of Physiology, Faculty of Medicine, Omar Al-Mukhtar University, Al-Bayda, Libya.

Email. Kozomoahmed121@gmail.com

ABSTRACT

Background and Objective. The purpose of this study was to identify the relation between and different Cerebrovascular accidents (CVA) risk factors in AL Bayda Medical Center. **Methods.** A retrospective cross-sectional study of 170 (CVA) patients who were admitted to the medical ward of AL Bayda Medical Center from May 2022 to JUN 2023. The data was collected by reviewing hospital records for all admissions of CVA. Cases of transient ischemic attacks (TIA) were not included in the final analysis of the data due to uncertainty of diagnosis. **Results.** We included 170 cases of CVA excluding TIA. In regards of gender (61.7%) of the patients were male, females (38.2%), the difference was statistically significant ($p=0.02$). Mean age of male patients was 66.21 ± 12.46 y and 67.77 ± 11.85 y for female patients, respectively, showing no significant difference statistically. Regarding the underlying causes of CVA, ischemic type was observed in 100 patients (58.8%), and the rest of the patients (41.1%) were hemorrhagic type. The most common presenting complaints were weakness of limbs in 130 cases (76.4%), altered mental status in 21 cases (12.4%), headache, mouth angle deviation and slurring of speech in 19 cases (11.3%). The most common risk factor for stroke was hypertension in 99 patients (58.2%), smoking was the second most common modifiable risk factor in 79 patients (46.3%). **Conclusion.** Stroke is an amalgamate disease. The risk increasing with age and having male predominance. Hypertension was the most common risk factor and the most common type of stroke was ischemic stroke. These risk factors need an urgent program to reduce stroke morbidity and mortality.

Keywords: Risk Factors, Cerebrovascular Accidents, Ischemic Stroke, Hemorrhagic Stroke

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INTRODUCTION

Cerebrovascular accidents or stroke is an important healthcare concern. Resulting in high mortality and persistent disability in adults across the world. Stroke is being observed as a rapidly growing problem and an important cause of morbidity and mortality in Libya. Stroke is defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function lasting for at least 24 hours with no apparent cause other than that of vascular origin [1].

Most strokes (87%) are ischemic, caused by thrombotic or embolic occlusion of a major artery [2]. Transient ischemic attacks (TIAs) precede nearly 30% of ischemic strokes. If left untreated, one third of TIAs (Transient Ischemic Attacks) lead to ischemic stroke, 20% of them within the first month and 50% of them within the first year. A recent large-scale study has revealed that over 90% of the burden of stroke is attributed to the modifiable risk factors, including behavioral (e.g., smoking), metabolic (hypertension,

diabetes, hypercholesterolemia, low glomerular filtration rate, and high body mass index) and increasing age is an important non-modifiable risk factor for stroke [3]. Arterial hypertension (AH) causes hyaline degeneration and fibrinoid necrosis in the weak and short arteries supplying the base of the brain, including the thalamus, basal ganglia, brain stem, cerebellum, and internal capsule [4]. Therefore, it becomes one of the most imperative social and economic medical issues. Effective risk factor intervention represents the most appropriate way to reduce stroke morbidity and mortality.

METHODS

Retrospective cross-sectional study was applied to analyze the predisposing risk factor among CVA patients admitted at Al-Bayda Medical Center. The research protocol was approved by the Research Ethics Committee (REC) of Omar Al-Mukhtar University. The data was collected by reviewing hospital paper records for all admissions of CVA patient in medical ward in AL Bayda Medical Center. Data collection was conducted between May 2022 and June 2023. The sample size consisted of 170 CVA cases. Data collected include detailed medical history, clinical presentation, vital signs, lab values (whenever available), CT scan findings, socio-demographic characteristics, such as age, gender, stroke subtype (ischemic or hemorrhagic), risk factors (hypertension, diabetes, hyperlipidemia, smoking habits, Atrial fibrillation (AF), a history of previous transient ischemic attacks, cerebrovascular accidents (CVAs).

Statistical analysis

Analysis of study data was performed using SPSS (Statistical Package for Social Sciences) version 23. Mean \pm SD was mentioned for quantitative values. Frequency and percentages were mentioned for qualitative variables. In all items, $p < 0.05$ was considered statistically significant.

RESULTS

The age range was from 41 years to 80 years with mean age of 67 years. The risk of stroke is more prominent to those in the age group of 61-70 years old, which comprises 51.8% of total patients, young stroke (age ≤ 45 years) comprises 11% of all patients as shown in Table 1. The mean \pm standard deviation of age in male patients was 66.21 ± 12.46 y and 67.77 ± 11.85 y for female patients, respectively, showing no statistically significant difference ($p = 0.25$).

Table 1. Age distribution of the patients.

| Age groups (years) | Frequency | Percent % |
|--------------------|-----------|-----------|
| 41-50 | 20 | 11.5 |
| 51-60 | 63 | 37.3 |
| 61-70 | 88 | 51.8 |
| 71-80 | 19 | 11.7 |

The majority of patients were males (61.7%). The percentage of females was (38.3%), the difference was statistically significant ($p = 0.02$).

Table 2. Sex distribution of stroke cases.

| Sex | Frequency | Percent % |
|--------|-----------|-----------|
| Female | 65 | 38.3 |
| Male | 105 | 61.7 |
| Total | 170 | 100 |

In regard to the stroke subtypes risk factors, our results show that the majority of the patients was diagnosed as ischemic type CVA (58.8 %), the rest (41.1%) were diagnosed as hemorrhagic type. There was no statistically significant correlation in terms of sex and the subtype of stroke ($p > 0.05$). The mean age of the patients having ischemic stroke was 68.55 ± 10.11 y, and it was 66.21 ± 11.03 in hemorrhagic stroke. The difference was statistically significant ($p = 0.03$) between the two groups.

Arterial blood pressure was higher in hemorrhagic stroke patients compared to ischemic subpopulation. Systolic BP of 165.4 ± 22.1 mmHg and diastolic BP of 99.9 ± 11.9 mmHg in hemorrhagic stroke as compared to systolic BP of 150.7 ± 18.8 mmHg and diastolic BP of

90.1±15.4 mmHg in ischemic stroke (p=0.02). Smoking was second common risk factor in our population. Smokers were significantly more frequent among ischemic subpopulation (27.2%) (p=0.01). Atrial fibrillation (AF), which is an established risk factor, was found in 34 cases (20.3%). However, it was significantly higher among ischemic subpopulation (p=0.02). Diabetes mellitus was found in 30 cases (17.6%), also 17 patients out of 30 who were known diabetic had ischemic stroke. The mean random blood sugar level was 126.3 ±33.2 mg/dl. There was no significant difference in mean random blood sugar level between ischemic and hemorrhagic stroke patients. Dyslipidemia was found in 28 cases (14.5%). Nonetheless, there was no significant difference between the two subpopulation (p= 0.07). History of previous stroke(s) was more common in patients with hemorrhagic strokes than that in the patients with ischemic strokes but the difference was not statistically significant (p=0.4) (Table 3).

Table 3. Risk factors and the subtypes of stroke.

| Characteristics | Hemorrhagic stroke (70) | Ischemic stroke (100) | Percent t% | P-value |
|--------------------------------|-------------------------|-----------------------|------------|---------|
| Age (yr) | 66.21±11.03 | 68.55±10.11 | | 0.03 |
| Male (%) | 20.3% | 41.4 | 61.7% | 0.37 |
| Female (%) | 13.7 | 24.6 | 38.3 % | |
| Hypertension | 33.3 | 25.1 | 58.2 | 0.02 |
| Smoking | 19.1 | 27.2 | 46.4 | 0.01 |
| Atrial fibrillation | 8.7 | 12.3 | 20.2 | 0.02 |
| Diabetes mellitus | 7.5 | 9.5 | 17.6 | 0.11 |
| Dyslipidemia% | 8.2 | 6.3 | 14.5 | 0.07 |
| History of previous stroke(s)% | 19.9 | 14.7 | 33.5 | 0.4 |
| BP | | | | |
| Systolic | 165.4±22.1 | 150.7±18.8 | | |
| Diastolic | 99.9±11.9 | 90.1±15.4 | | |
| Blood glucose (mg/dl) | 125.40±15.24 | 126.18±53.17 | | |
| Total Cholesterol (mg/dl) | 199.42±23.65 | 185.33 ±31.64 | | |
| LDL (mg/dl) | 130.2±44.22 | 100.85±32.11 | | |
| HDL (mg/dl) | 39.32±7.93 | 50.25±22.28 | | |

The most common presenting complaints in the current study were weakness of limbs in 130 cases (76.4%). Altered mental status was seen in 21 cases (12.3%), headache, mouth angle deviation and slurring of speech in 19 patients (11.1 %) (Table 3).

Table 4. Patient's presenting complaints

| Complains | Prevalence | Percent % |
|--|------------|-----------|
| Weakness of limbs | 130 | 76.4. |
| Altered mental status | 21 | 12.4 |
| Headache, deviation of angle of mouth and slurring of speech | 19 | 11.3 |

The most common risk factor for stroke was hypertension in 99 patient (58.2 %), smoking was second common modifiable risk factor in 79 patient (46.4%). other risk factors are presented in Table 5.

Table 5. Prevalence of predisposing CVA risk factor

| Risk factor | Prevalence (%) |
|---------------------|----------------|
| Hypertension | 58.2 |
| Smoking | 46.3 |
| Atrial fibrillation | 20.2 |
| Diabetes mellitus | 17.6 |
| Dyslipidemia | 15.5 |

DISSCUSION

Stroke is a non-communicable disease and a worldwide leading cause of death and disability [5]. Identifying the high-risk groups people is very important preventive measure. Implying the medical measures to control the risk factors beside life style modification are proven to reduce the risk of occurrence of stroke in high-risk patients [6]. Current study evaluates the risk factors present in CVA patient admitted at Al-Bayda Medical Center. Most common type of stroke was ischemic, these findings were compatible with previous studies [7-9], who stated that the prevalence of hemorrhagic strokes was between 5% and 25%. Most of patients in our study

aged between 60 to 70 years in agreement with Maskey et al. and Ukoha Ob et al. who found the maximum number of cases of stroke occurred in age group 60 years and above [10,11]. there is a steep rise in incidence with age, old age is more common among the patients with ischemic strokes [8].

We also found A high prevalence of ischemic CVA among hypertension, an older age, atherosclerotic diseases, and AF patients [12]. The incidence of stroke in younger population < 45yrs in our study was 7.3% which is low compared to other study done in young adults in Saudi Arabia reported 33.5% of its study population to be younger than 45 yrs [13].

In current study incidence of stroke is more common in males, the higher percentage of stroke in male patients over females was in line with other previous study [12]. The possible reason may be increased risk factors such as cigarette smoking and alcohol consumption among males. In addition, there is no vascular protection of endogenous estrogens in males. This was unlike to some studies that reported incidence of stroke was higher in women than men [14] There was no significant difference between the subtype of stroke in terms of sex and the other risk factors. Previous study found that the risk factors such as age, sex, and blood pressure were predictive of the subtype of stroke [7]. The most common presenting complaints in current study population were weakness of limbs followed by altered mental status. This observation closely correlates with study done by Chitrabalam et al. [15].

The most common risk factor identified was hypertension in 58.2% of the patients in consistent with other study [16], as uncontrolled hypertension is the most important risk factor for stroke both in developing and developed countries. According to these results, controlling blood pressure is of high importance while controlling CVAs.

On the other hand, smoking was documented in 46.3% of patients in current study, while the previous study from Jordan reported a lower prevalence 24.6% [12]. Cardiac disease like atrial fibrillation, coronary disease and heart failure were commonly associated

with ischemic stroke than hemorrhagic strokes. Atrial fibrillation which is great source of cardioembolic stroke was diagnosed in 20.2% that was consistent with study by De Carvalho et al. [17]. Diabetes causes several metabolic and pathologic changes that lead to stroke, including arterial stiffness, systematic inflammation, endothelial dysfunction, and heart failure [18]. In our study diabetes mellitus was found in 30 cases (17.6%) were less as compared to other study done by Vaidya et al. [19]. In the current study, we also found that dyslipidemia was seen in 15.4% of total patients associated with increased incidence of stroke which was consistent with previous findings reported by Tziomalos et al. [20].

CONCLUSION

The present study is focused on found out relation between stroke and different risk factors in CVA patients admitted to Al Bayda Medical Center. It is concluded from our results that risk factors, can be a marker of CVA, these risk factors in AL Bayda city increase with an alarming rate needs an urgent program aiming for people to learn about risks and their warning signs and to take actions to prevent the disease. As well as seeking healthcare and to encourage in other aspects of getting a healthy lifestyle.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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