# Stroke Characteristics among Patients admitted to Al-Sadiq Teaching Hospital, Babylon Province, Iraq

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## ABSTRACT

**Background:** Stroke is a common medical problem that causes permanent disabilities and mortality.

**Aim:** To investigate the characteristics of stroke and the associated risk factors.

**Methods:** In a hospital-based cross-sectional study, information was collected from patients' records and by direct interview of patients or their companions with the help of a semi-structured questionnaire.

**Results:** The mean age of patients was (64), the male to female ratio was 1.37:1. The majority of patients had low educational levels, and two-thirds of them were urban dwellers. Comorbidities indicated that 71.9% patients had hypertension, 38.6% had diabetes, 37.7% had stroke history, and 16.7% had ischemic heart disease. Regarding social habits, 41.2% were current smokers or ex-smokers, 64.9% were overweight or obese. Regarding stroke awareness, 74.6% do not know the meaning of stroke. The majority 88.6% of cases were diagnosed in hospitals.

**Conclusion:** Ischemic stroke is the most familiar type of stroke where males are mainly affected. Hypertension, diabetes, and stroke were the most common diseases in the medical and family history, respectively.

**Keywords:** Babylon province, Iraq, Risk factors, Stroke.

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## INTRODUCTION

Stroke is diagnosed as clinical signs of focal neurological deficit which occur suddenly and last more than 24 hours duration originated due to vascular cause.[1,2] Stroke is the third-ranking cause of death.[3] Stroke has a great impact on the community due to its mortality, disability, and financial burden.[4,5] Stroke is the third cause of disease burden in developed nationalities.[6,7] A total of 3 to 4% of health care expenditure goes to stroke in western countries.[8] It should be noted that there are two main types of stroke. Firstly, ischemia due to interference of blood flow by thrombus or embolism leading to the death of brain tissue. On the other hand, hemorrhage is the other type that leads to brain tissue damage.[9,10] The COVID-19 pandemic has made stroke care even more challenging.[11] Risk factors for stroke depend on its type as risks for ischemic stroke are non-modifiable factors such as old age, male gender, and positive family history in addition to the modifiable risk factors.[1,2,9,10] While the risks for intracerebral hemorrhage involve old age, high blood pressure, Diabetes mellitus, and others.[1,9] This study was conducted to investigate stroke patients' clinical and epidemiological features and their associated factors.

## METHODOLOGY

This study is a hospital-based cross-sectional study conducted in Al-Sadiq Teaching Hospital from October 2019 through February 2020. Data were collected from patients' records, and interviews confirmed stroke patients and their companions using a pre-tested semi-structured questionnaire. Approval of the Ethical Research Committee in Hammurabi College of Medicine – Babylon University was obtained. Verbal consent of patients and their relatives were taken. The questionnaire includes demographic characteristics and information about the medical

history, family history of diabetes, hypertension, and history of stroke, information about tobacco smoking and Ex smoking. Weights and heights of patients are measured to calculate body mass index (BMI) (weight in kilogram/height in meter square), BMI, between 18–25 considered as normal in this study whereas BMI between > 25 to < 30 considered overweight those with > 30 considered obese. Analysis of data was accomplished by using statistical package for the social sciences (SPSS) version 26. Chi-square test and unpaired t student test were done to assess the strength of associations between variables $p \leq 0.05$ was considered statistically significant.

## RESULTS

Table 1 shows that the mean age of males is (65.0152) which is higher than females (63.5417), p-value = 0.566.

**Table 1:** Frequency distribution of the mean age of the study group by gender

| Gender | Mean of age (years) | Std. deviation | Number of cases |
|---|---|---|---|
| Male | 65.0152 | 13.90019 | 66 |
| Female | 63.5417 | 12.87081 | 48 |
| Total | 64.3947 | 13.43791 | 114 |

* t test value = 0.576 df= 112    p-value = 0.566 > 0.05

Table 2 shows the distribution of patients with stroke by socio-demographic characteristics and the 2 types of stroke. Male patients are more affected with a male to female ratio of 1.37:1. Regarding patients' levels of education, the majority are illiterate (40.4%). Table 3 shows the distributions of family history of certain chronic diseases; (59.6%), (43.0%), (29.8%), (25.4%) of the study group have a positive family history of hypertension, diabetes, stroke, and ischemic heart disease respectively. Table 4 shows the comorbidities of the patients according to type of stroke. There is a significant statistical difference between the presence of diabetes in ischemic stroke patients (45%) and hemorrhagic type p=0.03. In contrast, no significant differences (p>0.05) are detected regarding the medical history of stroke, hypertension, IHD, and heart failure, respectively.

Table 3 shows that 41.2% are tobacco smokers, while no significant differences are found between the two types regarding smoking >0.05. Table 4 shows that three-quarters (74.6%) of patients do not know about the meaning of stroke; there is no relationship between knowledge of stroke meaning and stroke type.

Regarding the body weight of patients, 64.9% of them were overweight or obese. Moreover, the hemorrhagic stroke

**Table 2:** the distribution of patients with stroke by demographic characteristics and major two types of stroke

| Demographic feature | | Hemorrhagic stroke | Ischemic stroke | Total | p-value |
|---|---|---|---|---|---|
| gender | Male | 20 (58.8%) | 46 (57.5%) | 66 (57.9%) | Pearson Chi-Square = 0.017 df = 6, p-value = 0.896 |
| | Female | 14 (41.2%) | 34 (42.5%) | 48 (42.1%) | |
| | Total | 34 (100.0%) | 80 (100.0%) | 114 (100.0) | |
| Education | illiterate | 11 (32.4%) | 35 (43.8%) | 46 (40.4%) | |
| | Read and write | 0 (0.0%) | 3 (3.8%) | 3 (2.6%) | |
| | Primary school | 11 (32.4%) | 24 (30.0%) | 35 (30.7%) | Pearson Chi-Square = 6.698 df = 5, p-value = 0.244 |
| | Intermediate school | 8 (23.5%) | 8 (10.0%) | 16 (14.0%) | |
| | Secondary school | 0 (0.0%) | 3 (3.8%) | 3 (2.6%) | |
| | Higher education | 4 (11.8%) | 7 (8.8%) | 11 (9.6%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |
| Address | Urban | 20 (58.8%) | 56 (70.0%) | 76 (66.7%) | Pearson Chi-Square = 1.341 df = 1, p-value = 0.247 |
| | Rural | 14 (41.2%) | 24 (30.0%) | 38 (33.3%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |

**Table 3:** Distributions of family history of certain chronic diseases according to stroke types.

| Family History | | Hemorrhagic Stroke | Ischemic Stroke | Total | p-value |
|---|---|---|---|---|---|
| family history of Hypertension | Negative | 13 (38.2%) | 33 (41.3%) | 46 (40.4%) | Pearson Chi-Square = 0.090 df = 1, p-value = 0.764 |
| | Positive | 21 (61.8%) | 47 (58.8%) | 68 (59.6%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |
| family history of Diabetes Mellitus | Negative | 19 (55.9%) | 46 (57.5%) | 65 (57.0%) | Pearson Chi-Square = 0.025 df = 1, p-value = 0.873 |
| | Positive | 15 (44.1%) | 34 (42.5%) | 49 (43.0%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |
| family history of stroke | Negative | 24 (70.6%) | 56 (70.0%) | 80 (70.2%) | Pearson Chi-Square = 0.004 df = 1, p-value = 0.950 |
| | Positive | 10 (29.4%) | 24 (30.0%) | 34 (29.8%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |
| family history of ischemic heart diseases (IHD) | Negative | 26 (76.5%) | 59 (73.8%) | 85 (74.6%) | Pearson Chi-Square =.093 df = 1, p-value = 0. 760 |
| | Positive | 8 (23.5%) | 21 (26.3%) | 29 (25.4%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |

**Table 4:** Medical history of stroke patient according to the type of stroke

| Medical history: | | Hemorrhagic stroke | Ischemic stroke | Total | p-value |
|---|---|---|---|---|---|
| medical history of stroke | Negative | 23 (67.6%) | 48 (60.0%) | 71 (62.3%) | Pearson Chi-Square = 0.594 df = 1, p-value = 0.441 |
| | positive | 11 (32.4%) | 32 (40.0%) | 43 (37.7%) | |
| | Total | 34 (100.0%) | 80 (100.0%) | 114 (100.0%) | |
| Medical history of hypertension | Negative | 11 (32.4%) | 21 (26.3%) | 32 (28.1%) | Pearson Chi-Square = 0.440 df = 1, p-value = 0.507 |
| | Positive | 23 (67.6%) | 59 (73.8%) | 82 (71.9%) | |
| | Total | 34 (100.0%) | 80 (100.0%) | 114 (100.0%) | |
| Medical history of diabetes mellitus | Negative | 26 (76.5%) | 44 (55.0%) | 70 (61.4%) | Pearson Chi-Square = 4.641 df = 1, *p-value = 0.031 |
| | Positive | 8 (23.5%) | 36 (45.0%) | 44 (38.6%) | |
| | Total | 34 (100.0%) | 80 (100.0%) | 114 (100.0%) | |
| Medical history of ischemic heart disease (IHD) | Negative | 31 (91.2%) | 64 (80.0%) | 95 (83.3%) | Pearson Chi-Square = 2.146 df = 1, p-value = 0.143 |
| | Positive | 3 (8.8%) | 16 (20.0%) | 19 (16.7%) | |
| | Total | 34 (100.0%) | 80 (100.0%) | 114 (100.0%) | |
| Medical history of heart failure | Negative | 32 (94.1%) | 65 (81.3%) | 97 (85.1%) | Pearson Chi-Square = 3.114 df = 1, p-value = 0.078 |
| | Positive | 2 (5.9%) | 15 (18.8%) | 17 (14.9%) | |
| | Total | 34 (100.0%) | 80 (100.0%) | 114 (100.0%) | |

**Table 5:** Distribution of bad social habits and weight of the patients according to type of stroke

| | | Hemorrhagic stroke | Ischemic stroke | Total | p-value |
|---|---|---|---|---|---|
| Smoking history | No | 24 (70.6%) | 43 (53.8%) | 67 (58.8%) | Pearson Chi-Square = 3.757 df = 2, p-value = 0.153 |
| | Yes, and continuous | 6 (17.6%) | 15 (18.8%) | 21 (18.4%) | |
| | Ex-smoker | 4 (11.8%) | 22 (27.5%) | 26 (22.8%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |
| Overweight or Obesity: | Normal | 7 (20.6%) | 33 (41.3%) | 40 (35.1%) | Pearson Chi-Square = 4.472 df = 1, *p-value = 0.034 |
| | Overweight or obese | 27 (79.4%) | 47 (58.8%) | 74 (64.9%) | |
| | Total | 34 (100.0) | 80 (100.0) | 114 (100.0) | |

patients are significantly having a higher rate of overweight or obesity (79.4%) p <0.05

Table 5 shows that (88.6%) of cases were diagnosed in the hospital.

## DISCUSSION

In this study, the most common type of stroke is the ischemic type; this agrees with the results of (Kurmanji) who reported that 69.4% are ischemic stroke.[12] In addition, similar results were reported by two national studies 73% and 84.9%.[13,14] This difference may be due to the difference in sample size other modified or non-modified risk factors. In our study, we found that males outnumbered females, this difference is supported by,[15] this can be explained by the fact that elders (>65 years) have high prevalence of risk factors like diabetes atherosclerosis and smoking low serum vitamin D,[16,17] but this result disagrees with other studies.[14,15] Regarding educational level, we found that the majority were illiterates, these concords with studies of (Hasan and Mukhelif) and the finding of (Yi et al.) who concluded that low educational level is a risk of this disease.[18,19] About 2 thirds of patients have reported a family history hypertension, and this may be due to the epidemic pattern of hypertension in Iraq.[20] Diabetes in the family is reported in 40% of cases. It differs from the finding of (Yi et al.) study in China in which that only 16.4% of their

stroke patients have a positive family history of diabetes.[19] Hypertension is the most common chronic disease associated with stroke (71.9%), followed by diabetes mellitus with about 38.6%, and another comorbid condition is the presence of a previous stroke (37.7%). The association between stroke and hypertension may reflect the high prevalence of hypertension in Babylon province,[21] this agrees with the findings of (Kurmanji) and (Hasan, and Mukhelif) the percentage of hypertension in stroke patients is 72.2% and 74.5%, respectively,[12,18] while the prevalence is less in China 59.7%.[19] Diabetes associated significantly with stroke, and this agrees with (Sallman) [13] but disagrees with the findings of other studies (Kurmanji and Yi et al.)[12,19] Regarding the difference between the prevalence of diabetes and stroke types, the results agree with the studies that showed high prevalence of hypertension predisposing to ischemic type.[12,19] High proportion (41.2%) are tobacco smokers, which is higher than other researchers who found 26.5% of stroke cases were smokers (Sallman),[13] while other studies reported a higher smoking percentage of 61.5%.[19] Regarding the weight of patients, 64.9% were overweight or obese, which agrees with the finding of (Yi et al.)[19] in China. In comparison, it disagrees with (Hasan and Mukhelif ) who found that only 14.5% were obese.[18] A study suggested that obesity, overweight reduces Vitamin D levels among old Iraqi adults (Jawad IH and Baiee HA), which may increase

the risk of stroke.[22] The study illustrates that the majority, about 3/4 of patients and their relatives, did not know what the meaning of stroke is; this finding is supported by other studies conducted in Pakistan (Dar *et al.*),[23] the majority of patients with hypertension were aware of stroke, but the level of awareness of its risk factors was weak. Moreover, in study held in china, the awareness regarding stroke warning features and its risk factors was inferior in patients with a history of stroke.[24] Stroke management using telestroke platforms can be used and utilized similar to other countries to prevent and manage stroke properly in COVID -19 era and within the available resources.[25] Community health management program can be used in our primary health care centers (District Team Problem Solving approach that was proved to deal with addressing health problems like stroke.[21] The diagnosis was mainly in the hospital, and this might be due to the urgent situation of stroke and the weak primary health care services.

## CONCLUSIONS

Ischemic stroke is the most ordinary type of stroke. Male patients are more affected by stroke. Most of the associated factors with stroke are hypertension, diabetes, and obesity. The majority of patients did not know what the meaning of stroke is.

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