

Profile of stroke in a teaching university hospital in the western region

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ABSTRACT

Objective: An epidemiological study of stroke on patients admitted at King Abdul Aziz University hospital to determine the pattern of stroke, clinical presentation, risk factors and the outcome of the stroke in Saudis and non Saudis.

Methods: Case records of patients admitted with stroke between (January 1997 to January 2000) at King Abdul Aziz University Hospital which is a teaching hospital affiliated to Ministry of Education, provides health care to multinational population of mixed socioeconomic status. The diagnosis was established by radiological assessment either by computerized tomography scan or magnetic resonance imaging. Pattern of stroke, clinical presentations, risk factors and the outcome of stroke and other relevant data were documented.

Results: A total of 71 patients were admitted with stroke during the period of the study with incidence of 3% of total admission to the medical unit. The mean age was 63 years with male: female ratio of 3.4:1. Cerebral infarction was recorded in 80% of the cases. The most common presentation of stroke in Saudis were ischemic in 77% and hemorrhagic in 20.5%. Where as in non-Saudis, it was 85% and 7%. Intra cerebral hemorrhage was recorded in 15% of patients, while the subarachnoid hemorrhage only in 1%. Ruptured aneurysm diagnosed by cerebral angiogram attributed to the cause of subarachnoid hemorrhage.

Hypertension was the most important risk factor for ischemic and hemorrhagic stroke, as other risk factors were hyperlipidemia, diabetes mellitus, ischemic heart disease, atrial fibrillation and smoking. Death was the eventual outcome of stroke in 31% of patients, septicemia contributed to 35% of deaths, 77% of cerebral strokes were treated with aspirin, only 2 cases were treated by ticlopidine. Average hospital stay was 63 days, while 6 patients stayed longer than 600 days.

Conclusion: Stroke is a common neurological problem among patients admitted at King Abdul Aziz University Hospital and the pattern of stroke is similar to those reported from other parts of Saudi Arabia and other Arab countries. There was a high incidence of thrombotic stroke in our study. Hemorrhage was rare in our study especially subarachnoid hemorrhage. Hypertension was the most common risk factor, so emphasis should be made on strict control of blood pressure in the community to reduce the incidence of stroke. Since long hospital stay was observed in our study, we recommend establishment of more nursing homes and rehabilitation centers for stroke patients aiming to decrease the burden on the teaching hospital.

Keywords: Stroke, cerebral infarction, cerebral hemorrhage.

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Cerebrovascular disease (stroke) is the third leading cause of death after ischemic heart disease and cancer in many developed countries. It is one of the most important causes of long hospital admission and long term disability in most industrialized populations. It causes major financial

burden on medical health care but also causes extensive human and family suffering, prolong functional disability and associated mortality. Epidemiological studies have shown a consistent downward trend in the incidence and mortality of stroke in the industrialized countries.¹ However the

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Table 1 - Neurological clinical presentation.

Neurological clinical presentation	No of cases (%)
Coma	23 (32)
Confusion	11 (15.5)
Right hemiplegia	23 (32)
Left hemiplegia	26 (37)
Aphasia	23 (32)
Convulsion	2 (3)
Dizziness	5 (7)
Transit ischemic attacks	1 (1)

frequency of ischemic, hemorrhagic and unspecified types of stroke and respective etiologies also vary in the different parts of the world. This is an epidemiological study of the pattern of stroke in Saudi and non Saudi patients who have been admitted at King Abdul Aziz University Hospital in Jeddah, which is a teaching government hospital. It provides neurological service for Saudi and non-Saudi populations alike. This study aims to provide us with the underlying etiologies, so that the rational preventing and therapeutic strategies can be established for the may develop the planning of health care services.

Methods. King Abdul Aziz University Hospital (KAUH) is a 290 bed teaching government hospital, providing health care to a multinational population of mixed socioeconomic status. All patients admitted with the diagnosis of cerebrovascular disease (stroke) at KAUH from January 1997 to January 2000 were included in the study. Medical records of the stroke patients admitted to the medical unit and Intensive Care unit for three consecutive years were systematically reviewed.

The definition of stroke given by the World Health Organization, WHO, as rapidly developing clinical signs of focal or global disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than vascular origin (WHO1989)³ were applied to include these cases in this study. Patients with cerebral infarction, stroke in evolution, intra cerebral hemorrhage or subarachnoid hemorrhage who were documented either by CT scan or MRI were included in this study. The data included patient's age, sex, and nationality. The clinical neurological presentation and evaluation at the time of admission was classified as coma, confusion, right sided hemiplegia, left sided hemiplegia, aphasia, convulsion, and dizziness. Risk factors analyzed in the study included hypertension (sustained systolic

blood pressure > 160 mm/Hg and a diastolic blood pressure > 95 mm/Hg) or both, diabetes mellitus was considered present if the patients were already diagnosed and receiving medication or the fasting blood glucose values were 7.8 mmol/l, hyperlipidemia when the fasting cholesterol value was 6.7 mmol/l or triglyceride value 1.8 mmol/l, ischemic heart disease, post myocardial infarction, and atrial fibrillation, confirmed by standard 12 lead ECG and by 2D echocardiography and cigarette smoking especially amongst men. Carotid stenosis, confirmed by Doppler carotid ultrasound was carried out only in suspected cases. The outcome of these patients were classified into death, vegetative state, and improved with or without neurological deficit. Types of treatment given whether aspirin, ticlopidine or anticoagulation was recorded. Duration of hospital stay was recorded. Statistical analysis was carried out using the statistical Package for Social Science (SPSS 7.5). T- test and Chi-square were used appropriately. Results were considered significant if the p value is less than 0.05.

Results. A total of 71 patients were admitted with stroke during the three-year period between January 1997 to 31 December 2000. Forty four were Saudi (62%) and 27 (38%) non Saudi. There was an increase incidence in males as compared to females, 55 males 16 females and the overall male to female ratio was 3.4: 1. The mean age was 63 years (range 16-100 years). Radiological assessment was carried out on all patients, except three cases due to technical problems with machines. Fifty four CT scans and 4 MRI were carried out. Types of strokes were classified according to the radiological assessment into cerebral infarction (57 cases (80%), intracranial hemorrhage was found in 11 patients (16%). Of the intra-cranial hemorrhage, 6 had intra cerebral

Table 2 - Risk factors for stroke.

Risk factors for stroke	No of cases (%)
Hypertension	43 (61)
Diabetes	26 (27)
Hyperlipidemia	3 (4)
Smoking	20 (28)
Ischemic heart disease	6 (8.5)
Myocardial infarction	1 (1)
Post CABAG	2 (3)
Atrial fibrillation	3 (4)
Migraine	1 (1)
Sickle disease	1 (1)

Table 3 - Complications of stroke during hospitalization.

Complications	No of cases (%)
Infection (septicemia)	25 (35)
Intubation and ventilation	5 (7)
Repeated stroke (more than one stroke in short period)	3 (4)
Deep vein thrombosis	0 (0)

intracerebral hemorrhage, 2 cases of brain stem hemorrhage, 2 cases cerebellar hemorrhage and only one case had subarchnoid hemorrhage. The most common clinical neurological presentation at the time of the admission was left sided hemiplegia (37%) followed by right-sided hemiplegia, aphasia and coma in (32%) consecutively. Most of the patients had more than one neurological symptom at the time of admission. (Table 1).

The various risk factors associated with stroke.

Hypertension was the most common risk factor for both ischemic, as well as hemorrhage stroke (61%). Diabetes, smoking, ischemic heart disease, hyperlipidemia and atrial fibrillation were other common risk factors in that order of frequency. The majority of patients had 3 or more risk factors. Migraine was the risk factor in one young patient who improved dramatically a few days after admission. Vaso-occlusive crises due to sickle cell disease was the risk factor in one young patient. In about 8 patients with p value < 003, no commonly recognized risk factors were present apart from old age, which is statistically significant. Doppler ultrasound of the carotids was carried out in 12 patients in those only with high suspicion of carotid stenosis. Significant carotid stenosis was recorded in 4 patients only. (Table 2).

The out come of stroke was death in 31% with statistically significant p value <0004, 20% became

Table 4 - Outcome of stroke.

Outcome of stroke	No of cases (%)
Death	22 (31)
Vegative	14 (20)
Improved with neurological deficit	17 (24)
Improved without neurological deficit	18 (25)
Total	71 (100)

vegetative. However 25% improved without neurological deficit p <025 value, which is statically significant. (Table 3). The most common cause of death was septicemia in 35%, which was caused either by chest infection or urinary tract infection. Repeated stroke was reported only in 3 cases (4%) (Table 4). Forty four (77%) of cases were treated with aspirin, only two cases were given ticlopidine. Four patients received anticoagulation for atrial fibrillation and one heparin for stroke in evolution The length of the hospital stay was 60 days (range 2-1000 days). However 6 patients stayed for average of 600 days.

Discussion. This is an epidemiological study of stroke patients who were admitted at King Abdul Aziz University Hospital in the three years period between 1st January 1997 to January 2000). Stroke accounted for approximately (3%) of admission to the medical unit of KAUH during the period of the study which was similar to that found in other areas of Saudi Arabia, as well neighboring countries of Saudi Arabia like Bahrain in the Gulf region and Libya.³⁻⁸

Cerebral infarction accounted for 80% of cases, which was higher than those reported from other areas of Saudi Arabia as well as the Gulf region. The types of stroke in Saudi patients was ischemic in (77%) and hemorrhagic in 20.5%, as against 85% and 7% in non-Saudis. Intra cerebral hemorrhage was recorded in 15%, while subarachnoid hemorrhage was rare (1%) which was caused by ruptured aneurysm (proved by cerebral angiogram).¹¹⁻¹³ The main clinical presentation was left sided hemiplegia in 37%, followed by right-sided hemiplegia in 32%. The important risk factors were systemic hypertension in 61%, diabetes mellitus and ischemic heart disease. Two patients had stroke after coronary by-pass. Smoking and hyperlipidemia were less frequent risk factors. Most of our patients had more than one risk factor at the same time.¹⁴⁻¹⁸

One young female patient had stroke due to migraine, which was proved after, excluding hypercoagulabe conditions such as antiphospholipid antibodies, antithrombin 111, protein C, and protein S deficiency. She improved dramatically a few days after admission.¹⁹ One patient had brain stem infarction due to vaso-occlusive sickle cell crises.²¹⁻²³ Forty four patients were treated with aspirin, and only 2 cases with ticlopidine, because aspirin is cheap and effective in treating patients with cerebral infarction. In our series not a single patient was treated with antithromolytic therapy because of late presentation, as well as lack of other supportive facilities.^{24,25} The mortality rate was significantly high 31%. 18.5% in non-Saudis and 39% in Saudis. This could be explained by the fact that most of the cases in our study were old with many risk factors as well they stayed in the hospital for longer period of

time, and had hospital acquired infection which resulted in high mortality. Long hospital stay 63 days were noticed in our patients, however 6 patients stayed with average of 600 days because the family refused to take them home as well as lacking in the nursing homes and rehabilitation centers in Jeddah. This is a major problem as it causes burden to the nursing staff, and financial burden to the hospital as well decreases availability of beds for teaching cases.²⁵

In conclusion, stroke is a common neurological problem among patients admitted to KAUH. Apart from high incidence of thrombotic stroke, the pattern of stroke is similar in our study to those reported from other parts of Saudi Arabia and other Arab countries. Hemorrhage was rare in our study especially subarachnoid hemorrhage. Hypertension was the most common risk factor, so emphasis should be made on strict controlling of blood pressure in the community to reduce the incidence of stroke. To prevent long hospital stays as observed in our study, we recommend to establish sufficient nursing homes and rehabilitation centers to meet the needs of the growing and aging population. This in turn will decrease the burden on the teaching hospitals.

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