

**ISCHEMIC STROKE: RISK FACTORS AND DISTURBANCE OF CONSCIOUSNESS (A HOSPITAL-BASED STUDY)**

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**Abstract**

**INTRODUCTION:** This prospective observational study was conducted to determine the risk factors and disturbance of consciousness level in stroke patients in the medical wards of Khyber Teaching Hospital, Peshawar, Pakistan, from June 2005 to August 2006.

**METHODS:** A questionnaire was prepared in accordance with the objectives of the study. The questionnaire contained detailed history, general physical examination, and neurological examination. Prognosis of the disease was studied with the help of Glasgow Coma Scale (GCS) (severity of unconsciousness) scoring system.

**RESULTS:** One-hundred and eighty-three patients with established diagnosis of stroke were selected. Forty-seven (25.68%) had more than one risk factor. The age range of the patients was 31-92 years with mean age of 57 years. Out of total, 111 (60.65%) were male and 72 (39.34%) were female. The distribution of risk factors was as follows: hypertension 95 (51.91%), diabetes 56 (30.60%), hyperlipidemia 21 (11.47%), smoking 23 (12.56%), ischemic heart diseases 21(11.47%), atrial fibrillation 5 (2.73%), obesity 5 (2.73%), physical inactivity 2 (1.09%), history of heparin or warfarin use 2 (1.09%), and history of oral contraceptive use 1 (0.54%). The prognosis of the disease based on the GCS scoring system (severity of unconsciousness) was studied only in 122 (66.66%) patients. Out of 122 patients, 42.62% had scores greater than ten, 35.24% between 6 and 10, and 22.13% less than five.

**CONCLUSIONS:** Hypertension, diabetes, hyperlipidemia and smoking are major modifiable risk factors of stroke in our patients. More than half of the patients had unsatisfactory GCS scores, which indicates poorer prognosis.

**Keywords:** Stroke, Risk factors, Loss of consciousness, Peshawar.

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**Introduction**

Stroke is a clinical syndrome characterized by rapidly developing symptoms and/or signs of focal, and at times global loss of cerebral functions (comatose patients), with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin.<sup>1</sup> According to the World Health Organization report 2002, total mortality due to stroke in Pakistan was 78512.<sup>2</sup>

In India, China, Philippines, Thailand, Sri Lanka, Iran, Pakistan and Nepal, there has been a rapid increase in stroke mortality and prevalence of hypertension. The prevalence of hypertension based on new criteria (>140/90 mmHg) varies between 15% and 35% in urban adult populations of Asia. In rural populations, the prevalence is two to three times lower than in urban subjects.<sup>5</sup> In a study from Ayub Teaching Hospital, hypertension was found to be the most

common risk factor. Peak stroke prone age was 61-70 years in males and 51-60 years in females.<sup>3</sup>

The National Action Plan for Non-Communicable Disease Prevention, Control and Health Promotion in Pakistan (NAP-NCD) incorporates prevention and control of cardiovascular diseases (CVD) as part of a comprehensive and integrated non-communicable disease (NCD) prevention effort. It promotes screening for increased blood pressure at the population level and screening for dyslipidemia and diabetes, only in high-risk groups. It highlights the need to ensure the availability of aspirin, beta-blockers, thiazides, ACE inhibitors, statins and penicillin at all levels of healthcare. The program points out the need to conduct clinical end-point trials in the native Pakistani setting to define cost-effective therapeutic strategies for primary and secondary prevention of CVDs.<sup>4</sup>

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The present study was therefore designed to determine the risk factors and prognosis of stroke in Peshawar.

### Materials and methods

A prospective observational study was conducted in the medical wards of Khyber Teaching Hospital in Peshawar from June 2005 to August 2006. A total of 183 patients with established diagnosis of stroke were selected.

Stroke was defined as a focal neurological deficit due to vascular lesions that may be cerebral infarction or hemorrhage, confirmed on CT scan, resulting in partial or complete loss of motor and sensory activities.<sup>5</sup> Patients meeting the criteria for stroke, irrespective of age and sex were included. Patients with stroke due to causes like trauma or brain tumor were excluded from study.

Hypertension was defined as systolic blood pressure (BP) greater than 140 mmHg and diastolic BP >90 mmHg on more than one occasion.

Diabetes was defined as fasting blood sugar more than 126 mg/dl on more than one occasion and random blood sugar greater than 200 mg/dl on more than one occasion. Patients were labeled as hyperlipidemic if total serum LDL cholesterol was greater than 240 mg/dl, and triglycerides level was greater than 200 IU/dl. Patients with past history of coronary artery disease, diagnosed and confirmed by the consultants were also recorded.<sup>6</sup>

A detailed history about hypertension, diabetes, hyperlipidemia, alcoholism, smoking and use of oral contraceptives was taken. Reports on blood pressure, fasting blood sugar, random blood sugar and cholesterol and triglyceride levels were also recorded. Then the association of risk factors with stroke was studied. History of use of warfarin, heparin and aspirin was also recorded if any.

Disease prognosis was assessed with the help of Glasgow Coma Scale (GCS).

### Results

A total of 183 patients with established diagnosis of stroke were selected. The age range of the patients was 31-92 years with mean age of 57 years. Out of total, 111 (60.65%) were male and 72 (39.34%) were female.

The distribution of risk factors was as follows: hypertension 95 (51.91%), diabetes 56 (30.60%), hyperlipidemia 21 (11.47%), smoking 23 (12.56%), ischemic heart diseases 21 (11.47%), atrial fibrillation

5 (2.73%), obesity 5 (2.73%), physical inactivity 2 (1.09%), history of heparin or warfarin use 2 (1.09%) and history of oral contraceptive use 1 (0.54%) (Table 1).

The prognosis of the disease based on the GCS scoring system was studied only in 122 patients (66.66%). Out of 12 patients, 42.62% had scores greater than ten, 35.24% had scores between 6 and 10, and 22.13% had scores less than five (Table 2).

**TABLE 2.** Risk factors of stroke (total number of patients: 183)

Risk factors and their coexistence	Number of patients	Percentage of total (%)
Hypertension	60	32.78%
Diabetes	20	10.92%
Hyperlipidemia	9	4.91%
Smoking only	11	6.01%
Ischemic heart disease	21	11.47%
Hypertension + diabetes	23	12.56%
Hypertension + hyperlipidemia	3	1.63%
Hypertension + smoking	8	4.37%
Diabetes + hyperlipidemia	8	4.37%
Diabetes + smoking	4	2.18%
Diabetes+ hyperlipidemia+ hypertension	1	0.54%
Atrial fibrillation	5	2.73%
History of heparin and warfarin use	2	1.09%
Obesity	5	2.73%
Physical inactivity	2	1.09%
History of oral contraceptive use	1	0.54%

### Discussion

Stroke is a major cause of mortality and morbidity with disability and social dependence. In the western world, stroke is the third commonest cause of death after heart disease and all cancers.<sup>8</sup>

According to WHO report 2003, the disability adjusted life years (DALY) lost due to stroke per 1000 population of standardized age is 5-9 years for Pakistan, 10-14 for India, 15-19 for Russia and 20 or above for Mongolia.<sup>9</sup>

**TABLE 3.** Prognosis of patients based on the GCS scoring system

Classification of patients on the basis of Glasgow Coma Scale scoring system	Number of patients	Percentage of total
Group 'A' Score between 11-15	27	22.13%
Group 'B' Score between 6-10	43	35.24%
Group 'C' Score less than 5	52	42.62%

Hypertension is a major modifiable risk factor of stroke in our study recorded in 51.91% of patients. Our findings correlate with the findings of a mega project study in Karachi on the etiology and prognostic factors of patients admitted for stroke (50%)<sup>10</sup> and also with the stroke study at Ayub Teaching Hospital in Abbotabad (52%).<sup>6</sup> Diabetes is a second major modifiable risk factor for stroke in our patients, scoring 30.60%. Our findings correlate with findings of Basharat RA (21%)<sup>11</sup> and Liaqat A (27%).<sup>12</sup> Hyperlipidemia and hypercholesterolemia were recorded in 11.47% of patients presented with stroke, matching the findings of Tanveer A (16%).<sup>13</sup> Smoking was recorded as a modifiable risk factor in 12.56% of cases.

The respective population-attributable fraction (PAF) for current smoking was 22.0% for lacunar stroke and 11.4% for non-lacunar stroke. The PAF for elevated Von Willebrand factor was greater than that for current smoking for cardioembolic stroke.<sup>14</sup>

In the present study, the prognosis of disease based on the Glasgow Coma Scale scoring system was studied only in 122 (66.66%) patients. Out of 12 patients, 42.62% had scores greater than ten, 35.24% had scores between 6 and 10, and 22.13% had scores less than five. Our study correlates with the findings of a study conducted in Dublin; a reduced score on the Glasgow Coma Scale and larger strokes were associated with shorter delays to presentation. Longer delays occurred in patients living alone. There were significant delays in referral to, and assessment by certain rehabilitation disciplines. Delayed presentation in stroke is a barrier to thrombolysis.

Increasing public awareness may reduce this delay.<sup>15</sup> A US study on intracerebral hemorrhage shows a wide range of severity at presentation.

Hydrocephalus is a potentially reversible cause of a lower GCS score. Since early withdrawal of care decisions are often based on initial GCS, recognition of the important influence of hydrocephalus on GCS is warranted before withdrawal of care decisions are made.<sup>16</sup>

Hypertension, diabetes, hyperlipidemia and smoking are major modifiable risk factors of stroke. A reduced GCS is associated with poor prognosis of the disease and high morbidity. All major risk factors can be modified, but that requires awareness, education, elimination of poverty, use of medication and change in lifestyle.

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