A HOSPITAL BASED STUDY ON STRATIFICATION OF RISK FACTORS OF STROKE IN PESHAWAR

Hamzullah Khan[1], Akber Khan Afridi[2], Saadia Ashraf[3]

ABSTRACT

Objective: To determine the risk factors of stroke in Peshawar.

Design: Prospective observational study.

Place and Duration: Medical Wards of Khyber teaching hospital Peshawar from January 2004 to June 2005.

Patients and Methods: A questionnaire was prepared in accordance with the objectives of the study. Questionnaire contained detailed history, general physical examination, and neurological examination. Association of risk factors with stroke was also studied.

Results: Two hundreds and eleven patients with established diagnosis of stroke were selected. Sixty-six patients (31.27%) had more than one risk factors. The age range of patients was from 27 to 91 years with mean age of 59 years. Out of 211 patients 126(59.71%) were males and 85(40.28%) females. Risk factors distribution was: Hypertension (55.45%) diabetes (32.70%) hyperlipidemia (19.43%), smoking (10.90%), ischemic heart disease (9.00%), Atrial fibrillation (3.31%) and history of oral contraception use (0.94%).

Conclusion: Hypertension, diabetes, hyperlipidemia and smoking are major modifiable risk factors of stroke, which require proper management and counseling of patients.

KEY WORDS: Stroke, Risk factors, 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 (for patients in Coma) loss of cerebral functions, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin.[1] According to World Health Organization report 2002, total mortality due to stroke in Pakistan was 78512.[2] WHO estimate for year 2020 predict that stroke will remain the second leading cause of death after ischemic heart disease, both in developing and developed countries.[3] Annually, fifteen millions people worldwide suffer a stroke. Of these, five million die and another five million are left permanently disabled, placing a burden on family and community.[4] Stroke is uncommon in age below 40, when it does occur the main cause is high blood pressure. The major risk factors for stroke are similar to those of coronary artery disease, with high blood pressure, diabetes and tobacco use the most significant modifiable risks, while atrial fibrillation and heart attacks are also important risk factors to stroke.[5] Stroke burden is projected to rise from around 38 million DALYs (disability adjusted life years) globally in 1990 to 61 million DALYs in 2020.[2] Present

1. Mr. Hamzullah Khan
4th year MBBS,
Khyber Medical College,
Peshawar, Pakistan.
2. Professor Akber Khan Afridi
Professor of Community Medicine,
Khyber Medical College,
Peshawar, Pakistan.
3. Dr. Saadia Ashraf
Senior Registrar,
Pulmonology unit,
Khyber Teaching Hospital,
Peshawar, Pakistan.

Correspondences:

Mr. Hamzullah Khan
E-Mail: hamza_kmc@yahoo.com

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Table-I: Age range of patients with stroke

Age range	*Hypertension*	*Diabetes mellitus*	*Hyperlipidemia*	*Smoking*
27-40years	11(9.40)	6(8.69)	4(9.75)	6(26.08)
41-60years	43(36.75)	33(47.8)	22(53.6)	10(43.4)
61-80years	48(41.02)	21(30.4)	13(31.7)	5(21.73)
>80years	15(12.82)	8(11.59)	2 (4.87)	2 (8.69)

study was therefore designed as to determine the frequency of risk factors of stroke in patients hospitalized in Khyber teaching hospital(KTH) Peshawar

PATIENTS AND METHODS

This prospective observational study was carried out in Medical Department of Khyber teaching hospital Peshawar from January 2004 to June 2005. A total of 211 patients, 126 males and 85 females with age ranging from 27 to 91 were selected.

Stroke was defined as focal neurological deficit due to vascular lesions that may be cerebral infarction or hemorrhage, confirmed on C.T scan, resulting in partial or complete loss of motor and sensory activities. Patients meeting the criteria for stroke, irrespective of ages 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 more than 140mmHg and diastolic BP>90mmHg on more than one occasions. Diabetes was diagnosed as fasting blood sugar more than 126mg/dl on more than one occasions and random blood sugar more than 200mg/dl more than one occasion. Patients were labeled as hyperlipidemic if total serum LDL-cholesterol was more than 240mg/dl and triglycerides level was more than 200iu/dl. Patients with past history of coronary artery disease, diagnosed and confirmed by the consultants were also recorded.

A detailed history about hypertension, diabetes, hyperlipidemia, alcoholism, smoking and use of oral contraceptives was recorded. Investigation reports regarding blood pressure, fasting blood sugars and random blood sugars, cholesterol and triglyceride levels were also recorded. Then association of risk factors with stroke was studied. History of use of Warfarin, Heparin and Aspirin was also recorded.

RESULTS

A total of 211 patients were selected and all the risk factors were recorded. Sixty-six (31.27%) patients had more than one risk factors. Out of 211 patients 126 (59.71%) were males and 85 (40.28%) were females. Male to female ratio was 1.48:1. The age range of the patients varies from 22 years to up to 95 years with mean age of 58.5years. (Table-I)

Risk factors: Hypertension was major modifiable risk factor for stroke recorded in 17(55.45%) patients, followed by diabetes (32.70%) hyperlipidemia (19.43%), smoking (10.90%), ischemic heart disease (9.00%), Atrial fibrillation (3.31%) and history of oral contraception use (0.94%).

Duration of risk factors: The duration of major modifiable risk factors of stroke varied from newly diagnosed cases up to twenty years of the disease. Most of the patients had hypertension and diabetes for more than ten years. Table-II

Socioeconomic contribution to stroke: Patients were categorized in four classes i.e lower class,

Table-II: Duration of risk factors

Duration of Risk Factors	*Hypertension =117*	*Diabetes Mellitus =69*	*Smoking=23*
Less than 5years	15 (12.82)	10 (14.49)	3 (13.04)
Less than 10years	36 (30.76)	22 (31.88)	11 (47.82)
10-15 years	58 (49.57)	31 (44.92)	8 (34.78)
More than 15 years	9 (7.69)	6 (8.69)	1(4.34)

Table-III: Socioeconomic contribution to stroke

Income of patients/month	*Hypertension*	*Diabetes mellitus*	*Hyperlipidemia*	*Smoking*
<5000/month	43(36.7)	13(18.8)	5(12.19)	12(52.0)
6-10,000/month	38(32.4)	18(25.0)	12(29.2)	7(30.4)
11-20,000/month	17(14.5)	1(21.73)	11(26.8)	2(8.69)
>20,000/month	19(16.2)	23(33.3)	13(31.7)	2(8.69)

middle class, upper middle class and upper class. Lower social class had income up to 5000/month, middle class income was between 6000-10000/month while upper middle class had income between 11000-20000/month. All those whose monthly income was more than 20000/month were included in upper class. (Table-III) Details regarding family history of stroke and other risk factors are given in Table-IV.

Co-existing risk factors: The risk factors of stroke like hypertension and diabetes often coexist with each other and increase the chance of having coronary artery disease. Sixty-six patients (31.27%) had coexisting risk factors of stroke. In the present study coexisting risk factors were recorded in 27(12.79%) patients. Table-V. Among the hypertensive patients 72 were male and 45 were female. Sixty nine were diabetics of which eleven were of Type-I and fifty eight of Type-2 diabetes. We found 100% male patients in the study who had developed stroke were smokers. No patients had the history of use of Warfarin and Heparin etc, which are also risk factors for hemorrhagic shock.

DISCUSSION

Stroke is a major cause of morbidity and mortality with disability and social dependence. In western world, stroke is the third commonest cause of death after heart disease and all cancers.[6] According to WHO report 2003, the DALY's (disability adjusted life years) 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.[7] The risk of death depends on type of stroke. Transient Ischemic Attack (TIA) has the best outcome followed by stroke caused by carotid stenosis. The blockage of any artery with rupture of cerebral blood vessel is the most dangerous of all.[8] Hypertension most common risk factor for stroke was present in 55.45% of the whole sampling. Our findings are similar to that reported by Lickner H (40.06%).[9] Diabetes was the second most important risk factor present in 32.71% of patients. These findings correlate with findings of Basharat RA (21%)[10] and Liaqat A (27%).[11] Hyperlipidemia was found in 41 (19.43%) of patients and was the 3rd most common risk factor for stroke in this study which is similar to those reported by Tanveer A (16%).[12] Smoking was fourth most common risk factor of stroke in 8.27% of patients which is lower than reported by

Table-IV: Familial deposition stroke and its risk factors

Family history of Risk factors/Stroke	*Number of patients*	*Percentage (%)*
Hypertension	29	39.72
Diabetes mellitus	15	20.54
Hyperlipidemia	3	4.10
Hypertension & Diabetes	16	21.91

Table-V: Risk factors of Stroke and their coexistence

Risk factors	*Number of patients*	*Percentage (%)*
Hypertension	68	32.22
Diabetes mellitus	24	11.37
Hyperlipidemia	15	7.10
Smoking only	10	4.73
Ischemic heart diseases	19	9.00
Hypertension + Diabetes	27	12.79
Hypertension + Hyperlipidemia	13	6.16
Diabetes + Smoking	5	2.36
Diabetes + Hyperlipidemia	12	5.68
Hypertension + Smoking	8	3.79
Atrial fibrillation	7	3.31
Use of contraceptives	2	0.94
Hypertension + Diabetes + Hyperlipidemia	1	0.47
More than one risk factors seen	66	31.27
History of warfarin/heparin	0	00.00

Tanveer A (16%).[12] Cardiac diseases especially ischemic heart disease and Atrial Fibrillation are also known risk factors for stroke which were present in 19 and 7 patients respectively and are responsible for 12.32% of total stroke cases. These findings correlates with the findings of Kaul S (6%).[13,14] Coexistence of HTN and diabetes was recorded in 12.79% of stroke patients. Several factors have been implicated for coexistence of diabetes and hypertension possible reasons are the diabetogenic effect of Antihypertensive drugs[14] and insulin induced retention of sodium by Kidneys.[15]

CONCLUSIONS

Hypertension, diabetes, hyperlipidemia and smoking are major modifiable risk factors of stroke which will continue to challenge the clinicians. It requires proper management and counseling of patients. All major risk factors are modifiable but needs awareness, education, elimination of poverty, regular use of medication and changes in life style.

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