ASSOCIATION OF DYSLIPIDEMIA WITH DIABETES IN PATIENTS

WITH STROKE PATIENTS.

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Abstract;

Background; Stroke is a global health problem. Stroke is responsible for major disabilities in adult population, and is 2nd leading cause of deaths all over the world. Different studies have reported dyslipidemia as major cause of stroke in different populations. **Objective;** To determine the frequency of dyslipidemias in patients with ischemic stroke at Nishtar Hospital Multan. **Material and methods;** All the cases of stroke (n=240) Patients having finding on CT scan brain (plain) consistent with ischemic stroke of either sex aged less than 80 years were enrolled in this cross-sectional study from department of Medicine, Nishtar Hospital, Multan. Complete history about onset of illness, diabetes, hypertension and cardiac illness of the patients was taken. Baseline laboratory investigations including lipid profile and Hb A_1c were done. **Results;** Of these 240 study cases, 155 (64.6 %) were male patients and 85 (35.4%) were female patients. Mean age of our study cases was 68.37 ± 14.55 years (with minimum age was 34 years while maximum age was 79 years). Out of these 240 study cases, 138 (57.5 %) were from poor families, 53(22.1 %) were diabetic and only 11 out of 53 (20.75%) had controlled glycemic levels. Hypertension was present in 182 (75.8%) of our study cases and 39 (16.3 %) were obese. Smoking was present in 101 (42.1%), previous history of stroke was present in 35 (14.6%) and 83 (34.6%) were Saraikis. Mean duration of illness was 2.24 ± 0.53 months and 135 (56.3%) had disease duration more than 1 month. Mean serum cholesterol level was 202.06 ± 45.36 mg/dl, mean serum LDL level was 91.13 ± 10.24 mg/dl, mean serum triglyceride level was 147.51 ± 20.21 mg/dl and mean serum HDL level was 42.92 ± 3.85 mg/dl and dyslipidemia was present in 85 (35.4 %). Diabetes was significantly associated with dyslipidemia (p = 0.002).

Conclusion; Very high frequency of dyslipidemia was noted in diabetic patients having ischemic stroke. Dyslipidemia was significantly associated with diabetes, hypertension, obesity, smoking, previous history of stroke and ethnicity. Early diagnosis followed by timely management can help reduce disease morbidity and improve clinical outcomes in these patients.

Keywords; ischemic stroke, dyslipidemia, frequency.

Introduction;

Stroke (Cerebrovascular accidents) is characterized by sudden development of neurological deficit. Stroke is the foremost cause of adult disability and the second leading cause of mortality worldwide[1], with the burden of 15 million per year. Out of which, 5 million die and another 5 million are left incapacitated[2-5]. It is a huge public health problem imposing both a large disease burden and a large economic burden on the individual families and countries. Recent studies show that this problem is accelerating with the passing years. According to World Health Organization (WHO) estimates for the year 2020, stroke will remain the 2nd leading cause of death along with ischemic heart disease both in developing and developed countries[3, 6-8]. In addition, stroke patients in low income countries are younger than their western counterparts and consequently the burden of sustained disability in survivors is greater as well as total deaths from stroke in developing countries account for 85.5% of stroke deaths worldwide[4]. **Ischemic Stroke** occurs as a result of an obstruction within a blood vessel supplying blood to the brain. It accounts for 60-90% percent of all stroke cases in Pakistan. **Hemorrhagic**

Stroke occurs when a weakened blood vessel ruptures[9-15]. In Pakistan, more than 75000 deaths occur due to stroke and a large number of patients are left with partial or total disabilities which puts socio economic burden on the family and society [15]. Risk factors for stroke include hypertension (70.8%), diabetes (39.2%), smoking (26%) [6], obesity (18%)[1] and cardio embolic phenomena (25.3%) [7]. Dyslipidemia has been a known major risk factor for coronary heart disease. However more recently, it has been established as a risk factor in cerebrovascular disease[8].

The purpose of this study is to determine the frequency of dyslipidemias in the patients of ischemic stroke in the targeted population.

Material and Methods

All the cases of stroke (n=240) Patients having finding on CT scan brain (plain) consistent with ischemic stroke of either sex aged less than 80 years were enrolled in this cross-sectional study from department of Medicine, Nishtar Hospital, Multan. Patients having hemorrhagic stroke, brain tumors or any other local CNS pathology like tuberculous meningitis, viral or bacterial encephalitis and multiple sclerosis documented by neuroimaging i.e. CT scan and patients having cardiac illness were excluded from our study. Informed consent was taken from each patient/attendant to participate in this study. Complete history about onset of illness, diabetes, hypertension and cardiac illness of the patients was taken. Baseline laboratory investigations including lipid profile and Hb A_1c were done. Any one or more of the following on fasting lipid profile (12 hours of fasting)

Serum cholesterol ore than 200 mg/dl

Serum LDL level more than 100 mg/dl

Serum triglycerides level more than 150 mg/dl

Serum HDL level less than 40 mg/dl [12, 13].

Data was entered and analyzed by computer program SPSS.

Results;

Our study included a total of 240 patients with ischemic stroke meeting inclusion criteria of our study. Of these 240 study cases, 155 (64.6 %) were male patients and 85 (35.4%) were female patients. Mean age of our study cases was 68.37 ± 14.55 years (with minimum age was 34 years while maximum age was 79 years). Our study results have indicated that majority of our study cases i.e. 134 (55.8 %) belonged to the age group of 51 – 80 years of age. Out of these 240 study cases, 138 (57.5 %) were from poor families and 102 (42.5 %) were from middle income families. Fifty three (22.1 %) were diabetic and only 11 out of 53 (20.75%) had controlled glycemic levels. Hypertension was present in 182 (75.8%) of our study cases. Mean height of our study cases was 153.67 ± 10.91 centimeters while mean weight was 65.49 ± 6.46 kilograms and mean BMI was 25.14 ± 3.28 kg/m² and 39 (16.3 %) were obese. Smoking was present in 101 (42.1%), previous history of stroke was present in 35 (14.6%). Mean duration of illness was 2.24 ± 0.53 months and 135 (56.3%) had disease duration more than 1 month.

Mean serum cholesterol level was 202.06 ± 45.36 mg/dl, mean serum LDL level was 91.13 ± 10.24 mg/dl, mean serum triglyceride level was 147.51 ± 20.21 mg/dl and mean serum HDL level was 42.92 ± 3.85 mg/dl and dyslipidemia was present in 85 (35.4 %). Association of dyslipidemia with regards to diabetes has been described in Table No. 1.

Table No. 1

Stratification of low dyslipidemia with regards to diabetes.

(n = 240)

Diabetes	Dyslipidemia		P – value
	Yes (n = 85)	No (n = 155)	
Yes (n = 53)	51	02	
No (n = 187)	34	153	0.001
Total	240		

Discussion;

Stroke is a leading cause of long-term leading cause of the death worldwide. Dyslipidemia is a major risk factor for cardiovascular diseases. Our study included a total of 240 patients with ischemic stroke meeting inclusion criteria of our study. Of these 240 study cases, 155 (64.6 %) were male patients and 85 (35.4%) were female patients. Misirli et al [16] from Turkey has also reported male gender predominance with 55 % which is in compliance with our study results. A study conducted by Kumar et al [17] has also reported male gender preponderance with 76 % male patients and 24 % female patients which is in compliance with our study results. A study conducted in Hyderabad by Shaikh et al [18] has also reported male gender predominance with 73 % male patients with ischemic stroke which is close to our findings. A study conducted by Khan et al [1] from Karachi has reported 78 % male gender preponderance in ischemic stroke which is close to our study results.

Mean age of our study cases was 68.37 ± 14.55 years (with minimum age was 34 years while maximum age was 79 years). Our study results have indicated that majority of our study cases i.e. 134 (55.8 %) belonged to the age group of 51 – 80 years of age. Misirli et al [16] from Turkey has also reported 68.7 ± 10.9 years mean age of the ischemic stroke patients which is close to our study results. A study conducted by Kumar et al [17] has also reported 59.72 ± 6.40 years mean age the stroke patients which is close to our study results. A study conducted by Abid et al [19] has reported similar results.

Out of these 240 study cases, 138 (57.5 %) were from poor families and 102 (42.5 %) were from middle income families. A study conducted by Khan et al [1] from Karachi has also documented that more than 60 % of stroke patients belonged to poor families which is in compliance with our study results.

Diabetes mellitus (DM) is considered as one of the important risk factors of acute ischemic stroke (AIS), which has been proved in a series of studies. The important pathogenesy behind it is atherosclerosis, which perhaps has more direct correlation with the blood lipid. As the independent risk factors for cardiovascular and cerebrovascular disease, both of the DM and blood lipid have the impact on the AIS which is accepted wildly, but the relation between the DM and lipid during the occurrence and development of AIS is unclear. Fifty three (22.1 %) were diabetic and only 11 out of 53 (20.75%) had controlled glycemic levels. Hypertension was present in 182 (75.8%) of our study cases. Misirli et al [16] from Turkey has also reported 71.7 % hypertension while diabetes in 33.3% which is similar to our study results. A study conducted in Hyderabad by Shaikh et al [18] has also reported hypertension in 52 %, diabetes in 24.7 % which is similar to that of our study results. A study conducted by Kumar et al [17] has also reported diabetes in 30 % and hypertension was 51 % showing compliance with that of our study results. A study conducted by Khan et al [1] from Karachi has also documented 36 % diabetes which is slightly higher than our findings.

Mean height of our study cases was 153.67 ± 10.91 centimeters while mean weight was 65.49 ± 6.46 kilograms and mean BMI was 25.14 ± 3.28 kg/m^2 and 39 (16.3 %) were obese. A study conducted by Khan et al [1] from Karachi has also documented mean BMI of the ischemic stroke patients was 25.57 ± 0.68 kg/m^2 and obesity in 18.1 %. Smoking was present in 101 (42.1%), previous history of stroke was present in 35 (14.6%) and 83 (34.6%) were Saraikis. Misirli et al [16] from Turkey has also reported 35 % smoking in these patients

which is close to our findings. A study conducted by Kumar et al [17] has also reported smoking in 36 % which is close to our study results. A study conducted in Hyderabad by Shaikh et al [18] has reported smoking 11.3 % which is quite low than that of our findings. A study conducted by Khan et al [1] from Karachi has also documented 58 % smoking in patients with ischemic stroke which is close to our study results.

Mean serum cholesterol level was 202.06 ± 45.36 mg/dl, mean serum LDL level was 91.13 ± 10.24 mg/dl, mean serum triglyceride level was 147.51 ± 20.21 mg/dl and mean serum HDL level was 42.92 ± 3.85 mg/dl and dyslipidemia was present in 85 (35.4 %). Misirli et al [16] from Turkey has also reported 24 % dyslipidemia which is close to our findings. A study conducted by Kumar et al [17] has also reported dyslipidemia in 30 % which is close to our study results. A study conducted in Hyderabad by Shaikh et al [18] has also reported dyslipidemia 12 % which is less than that of our findings. Abide et al has reported 37.1% dyslipidemia which is close to our study results. A study conducted by Khan et al [1] from Karachi has also documented dyslidemia in 32.7 % which is similar to our study results.

Conclusion;

Frequency of dyslipidemia was high among patients having ischemic stroke in our study. Dyslipidemia was significantly associated with diabetes, hypertension, obesity, smoking, previous history of stroke and ethnicity. Early diagnosis followed by timely management can help reduce disease morbidity and improve clinical outcomes in these patients.

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