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Research Article

**A COMPARATIVE RESEARCH TO ASSESS THE
DEPENDENCY OF HEMORRHAGIC & ISCHEMIC STROKE
PATIENTS ON ALTERED LEVELS OF LOW-DENSITY
LIPOPROTEINS (LDL)**¹Dr. Muhammad Arslan Majeed, ²Hafiz Muhammad Jawad, ³Dr. Umer Munir¹THQ Hospital Shakargarh²Mayo Hospital Lahore³Aziz Bhatti Shaheed Hospital DHQ Gujrat**Abstract:**

Objective: The objective of this particular research was to compare LDL levels in hemorrhagic and Ischemic stroke in order to indicate the correlation of LDL with an onset of stroke.

Material and method: We conducted this comparative research at Mayo Hospital, Lahore from February to August 2017. Our research sample consisted of 618 patients diagnosed with stroke and we also compared the mean level of LDL among all the patients. The research sample was divided into two main group namely Group – I & II having 309 patients in each group.

Results: The factor of mean age in Group I & II was 60.15 years and 59.34 years respectively. In terms of gender distribution Group – I had 224 males (72.5%) and 85 females (27.5%). Whereas, in Group – II the gender distribution was such as that there were 204 males (66%) and 105 females (34%). We reported an abnormal LDL cholesterol value in 180 patients (58%) in Group – I; whereas, in Group – II there were 120 patients (38%) with an abnormal LDL cholesterol value. It was found that there is a strong relationship between the type of stroke and abnormal values of LDL cholesterol (P-Value 0.001).

Conclusion: It is an established fact in the light of research outcomes that levels of LDL cholesterol are increased in ischemic stroke patients in comparison to the hemorrhagic stroke patients. We can reduce the repeated ischemic stroke incidences through Statins.

Keyword: Stroke, Cholesterol, Low-Density Lipoproteins (LDL), Ischemic Stroke and Intracerebral Hemorrhage.

Corresponding author:

Dr. Muhammad Arslan Majeed,
THQ Hospital Shakargarh

QR code



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INTRODUCTION:

Stroke, which is actually acute neurologic injury is considered among those reasons which may lead to mortality and morbidity. Stroke is a clinical syndrome that describes various other disorders which may cause focal cerebral ischemia. It is very much important to define the incidence of stroke for research studies [1]. According to WHO, stroke is rapidly disturbed the function of the cerebral observed through developing clinical symptoms which are significant which may continue for twenty-four hours or even more than twenty-four hours; moreover, it may lead to an incidence of death without any particular reason except vascular origin [2]. According to definition both types of strokes that is intracerebral/cerebral infarction or and subarachnoid haemorrhage strokes come under it. An arbitrary bracket of time (24 Hours) differentiates the type of stroke from TIA (Transient Ischemic Attack). TIA refers to a kind of neurological deficit which lasts for a time of fewer than twenty-four hours [3]. Both are considered as the best available continuum; rather, in most of the TIA cases, they accompany cerebral infarction through neuroimaging. and fact, neuroimaging studies show that many cases of TIA are accompanied by cerebral infarction. All the vascular diseases are discoverable through cerebrovascular definition as it covers most of the diseases such as stroke, asymptomatic cerebrovascular disease and vascular dementia.

According to estimates, 80% strokes have an association with ischemic cerebral infarction; whereas, remaining 20% cases occur because of a brain haemorrhage. At an initial stage, the infarcted brain seems pale and grey matter becomes congested within days along with dilated, engorged blood vessels and petechial haemorrhages of minute nature [4]. When an embolus major vessel blockage migrates, disperses or lyses within a time of minutes to days it recirculates to the infarcted area which may lead to the formation of may aggravate oedema and hemorrhagic infarction because of blood-brain barrier disruption [5]. The brain is directly affected by a primary intracerebral haemorrhage by compression of nearby tissues of haemorrhage site [6].

An infarcted area is because of cerebral artery occlusion either because of embolus or thrombus from major or small artery such as carotid artery [7]. A number of ischemic strokes are because of reduced arterial blood supply that is responsible to carry oxygen and sugar to the tissues of the brain [8]. Among various other difficultly diagnosed strokes are because of brain occlusion veins that drain.

Venous occlusion is responsible for fluid backup which causes brain oedema and it may also attribute in the onset of brain haemorrhage and brain ischemia [9].

Stroke causes deaths, morbidity, disability and misery all over the world [10]. Huge numbers of stroke patients are also registered in Pakistani hospitals. These cases often meet death, partial disability or complete disability. The society also faces the social and economic burden. Prevention is better than cure policy is very much cost-effective in such patients [10].

Various studies report different mortality rate among affected patients all over the world [11]. The variation in the outcomes may have an association with prevention strategies, education and awareness among populations. Repeated risk factors causing an onset of stroke include diabetes mellitus, hypertension, atrial fibrillation, coronary artery disease, alcohol and physical inactivity. Stroke is controllable through preventing strategies while countering hypertension, atrial fibrillation management, quitting to smoke and disease burden reduction; even than stroke is a serious healthcare threat. Cerebrovascular diseases have domination in the middle-aged and late-years populations [12].

MATERIAL AND METHODS:

We conducted this comparative research at Mayo Hospital, Lahore from February to August 2017. Our research sample consisted of 618 patients diagnosed with stroke and we also compared the mean level of LDL among all the patients. The research sample was divided into two main group namely Group – I & II having 309 patients in each group. The patients diagnosed with an acute neurological deficit along with a hyperdense or hypodense area on Brain's CT Scan participated in the study. Whereas, we did not include any patient with non-established haemorrhage or infarction on Brain's CT scan, therapy of lowering lipid, Cerebrovascular Disease history, TIA patients and chronic diseases such as (CRF, CLD and CCF) patients. Stroke and its subtype identification were made through CT scan and clinical assessment. We documented every CT scan, radiological and clinical outcome on a predesigned proforma.

Level of LDL serum was measured through fasting venous samples. We also documented every information necessary for research purpose including various variables such as gender, age, hypertension, diabetes, smoking, hypertension and ischemic

diseases of the heart. SPSS software was used for outcomes analysis along with Chi-Square Test (P-Value 0.05).

RESULTS:

The factor of mean age in Group I & II was 60.15 years and 59.34 years respectively. In terms of gender distribution Group – I had 224 males (72.5%) and 85 females (27.5%). Whereas, in Group – II the gender distribution was such as that there were 204 males (66%) and 105 females (34%) as shown in Table – I. We reported an abnormal LDL cholesterol value in 180 patients (58%) in Group – I; whereas, in Group – II there were 120 patients (38%) with an abnormal LDL cholesterol value. It was found that there is a strong relationship between the type of stroke and abnormal values of LDL cholesterol (P-Value 0.001).

Group – I risk factors were such as 123 patients had diabetes (39.8%), 130 hypertension patients (42.1%), 184 ischemic heart disease patients (59.5%) and 170 cases of smoking (55%). Whereas, Group – II risk factors were such as 78 diabetic patients (25.2%), 226 hypertension patients (76.1%), 47 ischemic heart disease patients (15.2%) and 157 cases of smoking (50.2%) as reflected in Table – II.

Type of stroke stratification is available in Table – III. Group – I had a total of 180 patients of an abnormal level of cholesterol (58%); whereas, Group – II had a total of 120 cases of an abnormal level of cholesterol (38%). Stroke type had a strong relationship with the abnormal levels of LDL (P-Value 0.001).

Table – I: Gender Distribution

Gender	Group – I (309) (Ischemic Stroke)		Group – II (309) Hemorrhagic Stroke	
	Number	Percentage	Number	Percentage
Male	224	72.50	204	66.00
Female	85	27.50	105	34.00
Total	309	100	309	100

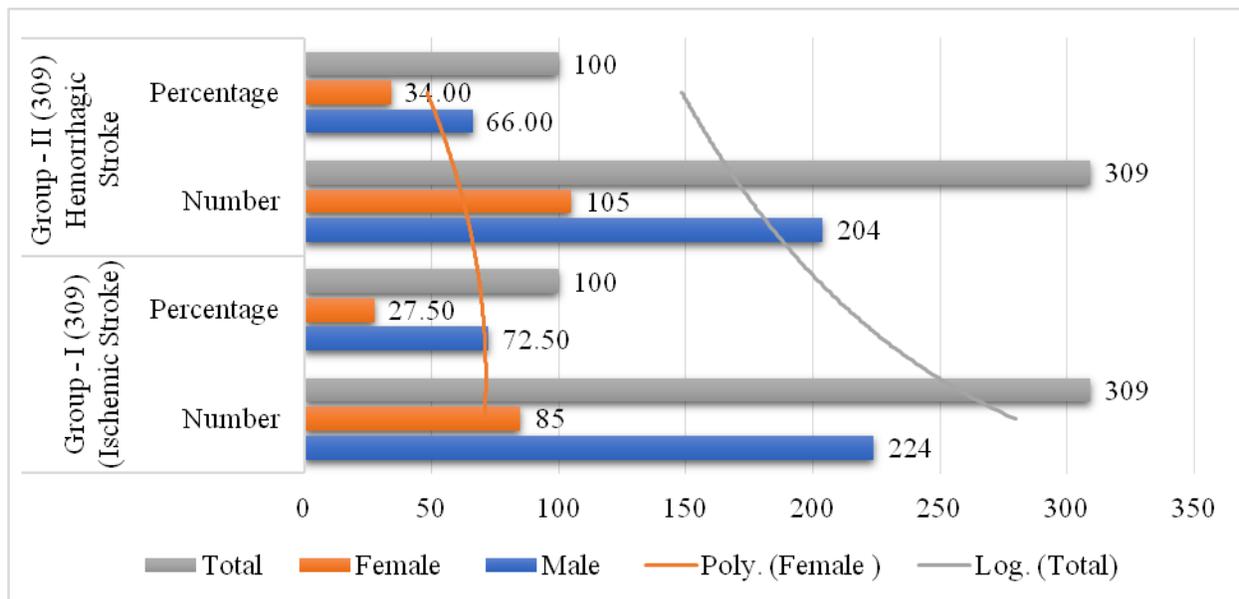


Table – II: Stratification of Variables

Variables	Group – I (309) (Ischemic Stroke)		Group – II (309) Hemorrhagic Stroke	
	Number	Percentage	Number	Percentage
Diabetes Mellitus	123	39.80	78	25.20
Hypertension	130	42.10	226	76.10
Smoking	170	55.00	157	50.20
Ischemic Heart Disease	184	59.50	47	15.20

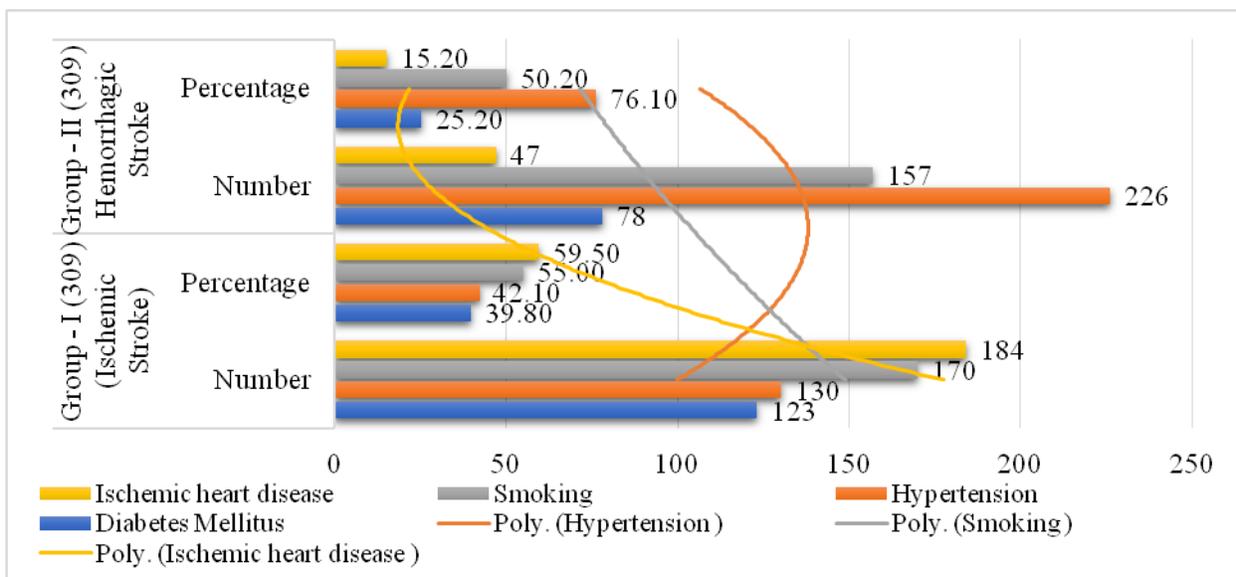
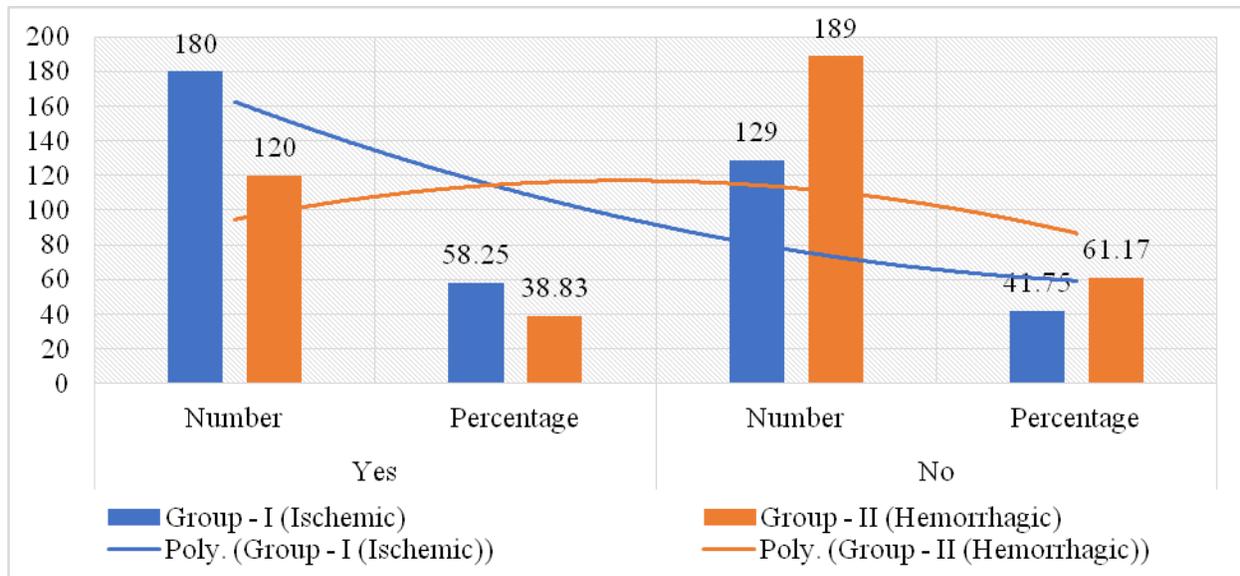


Table – III: Stroke Types Distribution

Stroke Types	Yes		No		P-Value
	Number	Percentage	Number	Percentage	
Group – I (Ischemic)	180	58.25	129	41.75	0.001
Group – II (Hemorrhagic)	120	38.83	189	61.17	



DISCUSSION:

Stroke is a healthcare issue with subsequent consequences all over the world with an increasing disease proportion; especially in the underdeveloped countries [13]. With the progression and development of cerebrovascular disease the risk factors also increase as modifiable and sometime non-modifiable contributions. Therefore, in this research, we aimed to probe into the association of levels of LDL with the onset of stroke among patients. The same is also practised in various other research studies but the outcomes are always conflicting as few prove an association; on the other hand, few don't [14, 15].

Hemorrhagic stroke has an indirect relation with increased levels of LDL [16]. We reported a slightly different mean age of 60.15 years and 59.39 years respectively in Group - I and Group - II namely ischemic and haemorrhage stroke patients. According to Mahmood and Sulheria, the mean was (64.2 ± 12) years and (62 ± 10) years [13, 17]. The male to the female proportion in our research and a research conducted by Mahmood was respectively (2.60:1.00) and (3.60:1.00) [13]. Group - I risk factors were such as 123 patients had diabetes (39.8%), 130 hypertension patients (42.1%), 184 ischemic heart disease patients (59.5%) and 170 cases of smoking (55%). Whereas, Group - II risk factors were such as 78 diabetic patients (25.2%), 226 hypertension patients (76.1%), 47 ischemic heart disease patients (15.2%) and 157 cases of smoking (50.2%). Whereas, Mahmood reported 41 diabetic cases (41%) of ischemic stroke and 25 diabetic cases (25%) of hemorrhagic stroke in the total of one hundred patients [13]. Group - I had a total of 180 patients of an abnormal level of cholesterol (58%); whereas,

Group - II had a total of 120 cases of an abnormal level of cholesterol (38%). Stroke type had a strong relationship with the abnormal levels of LDL (P-Value 0.001). Whereas, Mahmood reported 70 and 40 of hypertension in respectively ischemic and hemorrhagic stroke patients in the total of one hundred patients [13]. Which makes diabetes as a major risk factor among ischemic and hypertension among hemorrhagic stroke patients.

In terms of LDL levels, Sulehria reported a comparable total of forty patients among ischemic stroke patients having 22 cases of the increased level of LDL (55%) and 18 patients with a normal level of LDL (45%) [17]. According to Mahmood, increased LDL levels were prevalent in forty-two patients in the total of one hundred patients belonging from ischemic stroke group [13].

In the patients of hemorrhagic stroke), the increased levels of LDL are comparable with the outcomes of Sulheria as he reported 18 cases of the increased level of LDL (45%) and 22 normal LDL patients (55%) in the total of forty patients [17]. In another series conducted by Mahmood on a total of 100 patients, 22 hemorrhagic stroke patients had an increased LDL level [13].

CONCLUSION:

In this research, on the basis of research outcomes, we conclude that an increased level of LDL is a major ischemic stroke risk factor than the onset of hemorrhagic stroke. More common hypertension incidence was available in the patients of hemorrhagic stroke than the patients of ischemic stroke. Ischemic heart disease was a potent risk for

ischemic stroke than the incidence of hemorrhagic stroke. Therefore, in order to reduce the reoccurrence of ischemic stroke the use of statins is mandatory among patients.

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