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ROLE OF LIPID PROFILE IN ACUTE ISCHEMIC STROKE

Dr. Kavya. D[1], Dr. Vignesh[1], Dr. Basavaraju. M. M[2]

[1]Postgraduate, General medicine, MMCRI, Mysore
[2]Professor, Dept. of General Medicine, MMCRI, Mysore

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***Corresponding Author**
Dr. Kavya. D, Postgraduate, General medicine, MMCRI, Mysore

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A B S T R A C T

Introduction: Stroke is defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function lasting for at least 24 hours with no apparent cause other than of vascular origin. It constitutes a dreadful burden of disability. Modifiable risk factors include hypertension, diabetes and hypercholesterolemia, atrial fibrillation, smoking, drug abuse, and alcohol intake. Changes in the lipid profile have been suggested with formation of atherosclerosis.

Aims and objective: To evaluate lipid profile levels in patient with acute ischemic stroke and to compare this parameter with severity of stroke.

Materials and methods: The cross-sectional study of one and half year duration (Feb2021-Aug2022) was done on 100 patients of acute ischemic stroke presented to K.R. Hospital, Mysore. The main goal was to determine whether hypercholesterolemia is a risk factor for high severity.Lipid profile was measured by collecting the patients' blood after fasting for 9 to 12 hours. Severity of stroke was assessed by NIHSS. Based on NIHSS scores divided into minor (1-4), moderate (5-15), moderate to severe (16-20), severe (21-42) groups.

Along with assessment with severity, lipid profile was compared between severity of stroke.

Statistical analysis: Data analysed using SPSS software version 22.0 and it will be presented as descriptive statistics in form of frequency table and graphs. Association between variables will be done using chi-square test and unpaired t test for qualitative and quantitative variables. Result will be expressed as mean+/-SD. Correlation of parameters is done by Pearson's correlation formula. A p value of <0.05 is considered statistically significant.

Results and conclusion: Among 100 cases higher levels of TC, TGL, LDL were associated with more severity of stroke. 9 were in minor group, 47 were in moderate group, 29 were in moderate to severe group, 15 were in severe group. As the severity increases the mean level of TC, TGL, LDL, VLDL also increases, mean HDL level decreases. P value being <0.05, statistically Significant, showing clinical correlation with severity of stroke. Higher TC, TGL, LDL and lower HDL increases the risk of severity of stroke. Association Were strong for higher level of TC and LDL Early detection and treating with lipid lowering drugs helps to reduce the risk and prevent morbidity and mortality.

Key words: NIHSS, TC, TGL, LDL, VLDL, HDL.

INTRODUCTION

Stroke is defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function lasting for at least 24 hours with no apparent cause other than of vascular origin.[1]

It is the second leading causes of death worldwide. Around 85% of strokes are ischemic while 15% are due to hemorrhage either intracerebral or subarachnoid.[2]

It constitutes a dreadful burden of disability. Modifiable risk factors include hypertension, diabetes and hypercholesterolemia, atrial fibrillation, smoking, drug abuse, and alcohol intake.[3]. Changes in the lipid profile have been suggested with formation of atherosclerosis [4]. Therefore, effective intervention of risk factor is needed.

The fasting lipid profile has many determinants including total cholesterol (TC), low-density lipoprotein (LDL), high-density lipoprotein (HDL), triglycerides (TG).

OBJECTIVES

1. To evaluate lipid profile levels in a patient with acute ischemic stroke.
2. To compare this parameter with severity of stroke.

MATERIALS AND METHODS

The cross-sectional study of one and half year duration (Feb2021-Aug2022) was done on 100 patients of acute ischemic stroke presented to K.R. Hospital, Mysore.

The main goal was to determine whether hypercholesterolemia is a risk factor for high severity.

Patients above 18yrs and acute ischemic stroke confirmed with radio imaging were included. Patients with underlying conditions like previous stroke, Tia's, Liver and cardiac illness, hypothyroidism, active illness and any lipid lowering agents were excluded.

Lipid profile was measured by collecting the patients' blood after fasting for 9 to 12 hours. Severity of stroke was assessed by NIHSS. Based on NIHSS scores divided into minor (1-4), moderate (5-15), moderate to severe (16-20), severe (21-42) groups.

Along with assessment with severity, lipid profile was compared between severity of stroke.

Data analysed using SPSS software version 22.0 and it will be presented as descriptive statistics in form of frequency table and graphs. Association between variables will be done using chi-square test and unpaired t test for qualitative and quantitative variables. Result will be expressed as mean+/-SD. Correlation of parameters is done by Pearson's correlation formula. A p value of <0.05 is considered statistically significant.

RESULTS

Among 100 cases higher levels of TC, TGL, LDL were associated with more severity of stroke . 9 were in minor group, 47 were in moderate group, 29 were in moderate to severe group, 15 were in severe group. Mean level in severity groups.

minor – TC154.65±26mg/dl, TGL-97.6±18mg/dl, LDL-83mg/dl, VLDL-33.8±7mg/dl, HDL-37.8±3mg/dl.

Moderate - TC-174.42±36mg/dl, TGL-132.21±40mg/dl, LDL-99.43±19mg/dl, VLDL-40.26±10mg/dl, HDL-34.7±3mg/dl.

Moderate to severe- TC-218.62±m59g/dl, TGL-180.13±m68g/dl, LDL-134.9±29mg/dl, VLDL-50.49±14mg/dl, HDL-33.12±3mg/dl

Severe - TC-284.68±108g/dl, TGL-246.03±93g/dl, LDL-186.66±m48g/dl, VLDL-68.45±26mg/dl, HDL-31.07±4mg/dl.
P value being <0.05.

Table 1 showing mean values

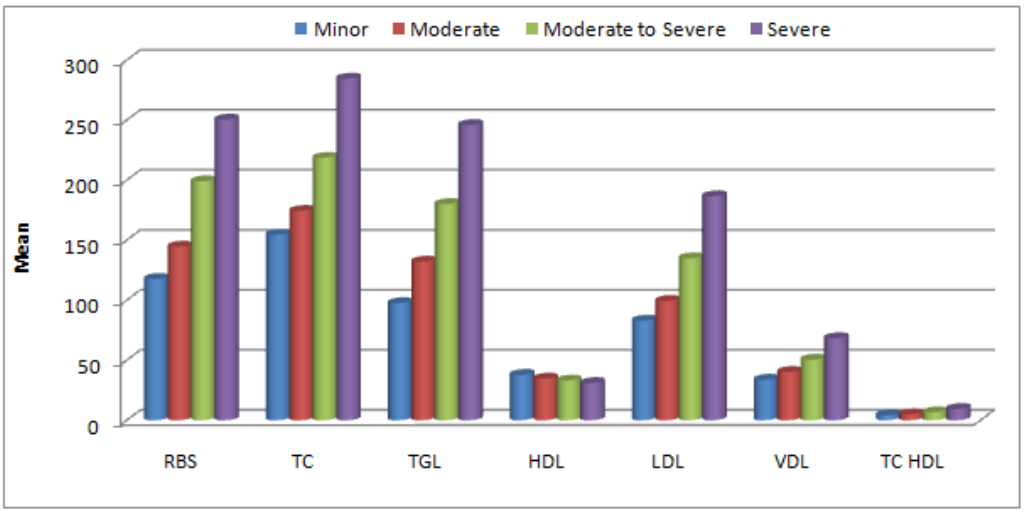
Descriptives

		N	Mean	Std. Deviation	Std. Error
RBS	Minor	9	117.7778	15.11438	5.03813
	Moderate	47	144.6809	47.62585	6.94694
	Moderate to Severe	29	199.1724	83.00950	15.41448
	Severe	15	250.4667	144.43677	37.29341
	Total	100	173.9300	87.96823	8.79682
TC	Minor	9	154.6556	26.20473	8.73491
	Moderate	47	174.4213	36.14136	5.27176
	Moderate to Severe	29	218.6138	59.50801	11.05036
	Severe	15	284.6867	108.07097	27.90381
	Total	100	201.9980	70.69102	7.06910
TGL	Minor	9	97.6000	18.27929	6.09310
	Moderate	47	132.2149	40.82042	5.95427
	Moderate to Severe	29	180.1379	68.88787	12.79216
	Severe	15	246.0333	93.37239	24.10865
	Total	100	160.0700	73.05528	7.30553
HDL	Minor	9	37.8556	3.02618	1.00873
	Moderate	47	34.7000	3.77123	.55009
	Moderate to Severe	29	33.1276	3.71963	.69072
	Severe	15	31.0733	4.67875	1.20805
	Total	100	33.9840	4.17870	.41787
LDL	Minor	9	83.0000	19.10792	6.36931
	Moderate	47	99.4340	29.87402	4.35757
	Moderate to Severe	29	134.9931	48.35324	8.97897
	Severe	15	186.6600	82.17786	21.21823
	Total	100	121.3510	55.88350	5.58835
VLDL	Minor	9	33.8000	7.34166	2.44722
	Moderate	47	40.2638	10.64861	1.55326
	Moderate to Severe	29	50.4931	14.49980	2.69255
	Severe	15	68.4533	26.76613	6.91098
	Total	100	46.8770	18.12441	1.81244
TC HDL	Minor	9	4.0378	.60599	.20200
	Moderate	47	5.0234	1.18436	.17276
	Moderate to Severe	29	6.7162	2.36612	.43938
	Severe	15	9.4200	4.15059	1.07168
	Total	100	6.0851	2.72378	.27238

Table 2 showing p value (ANOVA)

TC Table 2 showing p value(ANOVA) (mg/dl)	**154.66(±26.2)**	**174.42(±36.14)**	**218.61(±59.51)**	**284.69(±108.07)**	**.000**
TGL Table 2 showing p value(ANOVA) (mg/dl)	97.6(±18.28)	132.21(±40.82)	180.14(±68.89)	246.03(±93.37)	.000
HDL (mg/dl)	37.86(±3.03)	34.7(±3.77)	33.13(±3.72)	31.07(±4.68)	.000
LDL (mg/dl)	83(±19.11)	99.43(±29.87)	134.99(±48.35)	186.66(±82.18)	.000
VLDL (mg/dl)	33.8(±7.34)	40.26(±10.65)	50.49(±14.5)	68.45(±26.77)	.000
TC/HDL	4.04(±0.61)	5.02(±1.18)	6.72(±2.37)	9.42(±4.15)	.000

Graph 1



DISCUSSION

In this study showed total cholesterol, triglycerides, LDL levels were high and lower level of HDL in each group then the normal levels.

As the severity increases the mean level of TC, TGL, LDL, VLDL also increases, mean HDL level decreases.

TC and LDL helps in formation of atheroma, while HDL reduce neuronal damage both by antioxidant/anti-inflammatory mechanism.

P value being <0.05, statistically Significant, showing clinical correlation with severity of stroke.

Results were compared with study conducted by Muhammad Shoaib Asghar in 2020 in Karachi showed high LDL and TC having positive correlation with ischemic stroke than haemorrhagic.[5]

In comparison with study conducted by Joshua z willey in northern Manhattan in 2009 showed low LDL-C level were associated with significant lowering risk of stroke in atherosclerotic type and high HDL-C reported a strong protective effect on ischemic stroke in all ethnic groups, in those more than 75 years, and strongest in the atherosclerotic stroke subtype.[6]

CONCLUSION

Higher TC, TGL, LDL and lower HDL increases the risk of severity of stroke. Association Were strong for higher level of TC and LDL

Early detection and treating with lipid lowering drugs helps to reduce the risk and prevent morbidity and mortality.

In this study patients on lipid lowering drugs were excluded. Hence further exploration is required in to the usage of lipid lowering drugs and its protective mechanisms for stroke.

As following up of patients was not possible and assessing these parameters in prognosis of disease was limited.

Performing a larger study would be helpful to figure out the definite role of HDL and TG, TC, LDL levels in cerebral vascular insults.

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