http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v12i06.07

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Research Article

A comparative study of HDL levels in ischaemic and haemorrhagic stroke in a tertiary care hospital in south Rajasthan

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Abstract

Background: *Stroke is an medical emergency which is 3rd most common cause of death in developed countries. The cumulative incidence of stroke ranged from 105 to 152/100,000 persons per year, and the crude prevalence of stroke ranged from 44.29 to 559/100,000 persons in different parts of the country during the past decade. These values were higher than those of high-income countries.*

The WHO clinically defines stroke as "the rapid development of clinical signs and symptoms of focal neurological disturbance lasting more than 24 hours or leading to death with no apparent cause other than vascular origin.

Aim and Objectives:

- *To compare the level of serum HDL level between two categories of stroke.*

Objectives:

- *To compare the levels of serum HDL and study of lipid profile between two categories of stroke.*

Materials and Methods: *Sample size is of 100 patients and case control study was done, with 50 patients having ischemic stroke and 50 having haemorrhagic stroke who presented in Geetanjali medical college, Udaipur. Detailed physical and neurological examination was done. Fasting blood sample, Random blood sugar was taken in plain tubes. Results were recorded.*

Results: Study showed HDL was significantly decreased in ischemic stroke than hemorrhagic stroke and Total cholesterol, triglycerides, LDL, VLDL were more in ischemic stroke than hemorrhagic stroke.

Conclusion: *This study shows that there is a significant decrease in HDL in ischemic stroke than Hemorrhagic stroke. As the Reverse Cholesterol Transport, Anti-inflammatory activity, Anti oxidative activity, Anti apoptotic activity, Endothelial repair, Anti thrombotic activity, Anti infectious activity of HDL are reduced due to decreased HDL leads to ischemic stroke than Hemorrhagic stroke.*

Introduction

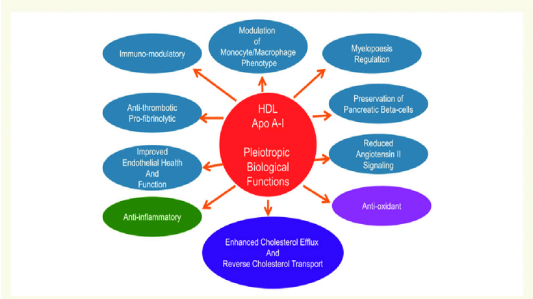
Stroke is abrupt neurological outburst caused by impaired perfusion through the blood vessels to the brain. Ischemic stroke is caused by deficient blood and oxygen supply to the brain; hemorrhagic stroke is caused by bleeding or leaky blood vessels .[1]

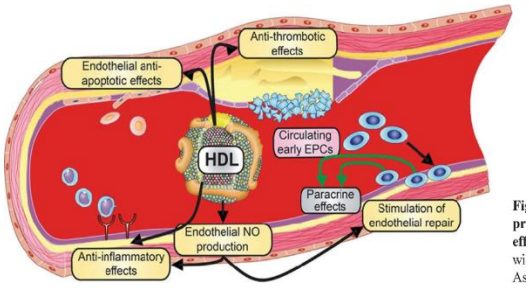
Ischemic occlusions contribute to around 85% of casualties in stroke patients, with the remainder due to intracerebral bleeding. Ischemic occlusion generates thrombotic and embolic conditions in the brain . In thrombosis, the blood flow is affected by narrowing of vessels due to atherosclerosis. The build-up of plaque will eventually constrict the vascular chamber and form clots, causing thrombotic stroke. In an embolic stroke, decreased blood flow to the brain region causes an embolism; the blood flow to the brain reduces, causing severe stress and untimely cell death (necrosis). [1]

Symptoms of stroke include the acute onset of unilateral paralysis, loss of vision, speech impairment, memory loss, impaired reasoning ability, coma or death. The risk factors include Diabetes, Hypertension, Dyslipidemia, Atherosclerosis, age, smoking and other rare causes. There is good evidence that modification of risk factors will reduce the risk of stroke. Recent studies shows that low level of HDL is an important risk factors for development of Atherosclerosis which is the precursor for cerebrovascular accident. The purpose of this study is to see difference in HDL level between two categories of stroke.

Role of HDL

HDL has anti apoptotic, anti-inflammatory activity, anti-oxidative activity and endothelial repair activity.[2] HDL has inverse relation of stroke in smokers and non-smokers. HDL with concentrations <40mg/dl were more likely to be associated with thromboembolic stroke than were HDL>60mg/dl. Each 10mg/dl increase in HDL-C decrease risk of ischemic stroke from 11% to 15%.[3] HDL seems to inhibit LDL oxidation and protect against atherosclerosis by its action on the vascular endothelium. Total cholesterol level is inversely related to the risk of hemorrhagic stroke. Higher level of LDL cholesterol seems to be related with lower risk of hemorrhagic stroke. HDL cholesterol level seems to be positively associated with risk of intracerebral hemorrhage. LDL-C levels <70 mg/dL and low triglyceride levels were associated with increased risk of hemorrhagic stroke among women.[4]





Aim of the Study

To compare the level of serum HDL between two categories of stroke.

Objectives of the Study

- To compare the level of serum HDL between two categories of stroke.
- To compare lipid profile between two types of stroke.

Duration of the Study

June 2023 to June 2024

Materials and Methods

Sample size is of 100 patients and case control study was done, with 50 patients having ischemic

stroke and 50 having haemorrhagic stroke who presented in Geetanjali medical college,Udaipur. Detailed physical and neurological examination was done. Fasting blood sample, Random blood sugar was taken in plain tubes. Results were recorded.

Inclusion Criteria:

- Age:35-70 years
- Both Male and Female
- Patient admitted with CVA with neurological weakness

Exclusion Criteria

- Pre-exisiting
- Cardiac Diseases
- CVA with tumour
- CVA with trauma
- Patient Refusal

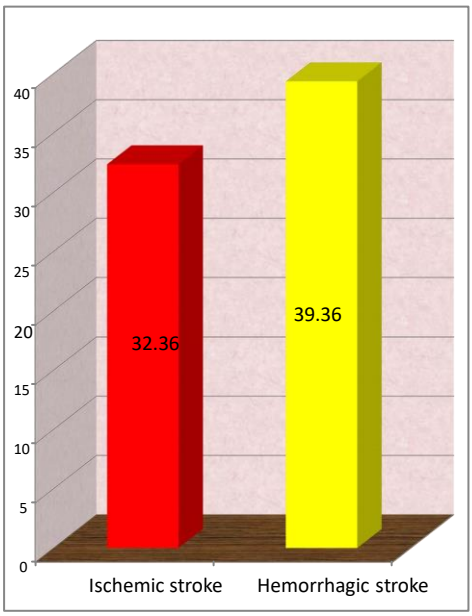
Result and Statistics

Comparison of Mean Lipid Profile between Ischemic and Hemorrhagic stroke

Lipid profile	Ischemic stroke	Hemorrhagic stroke
Total cholesterol	161.22	159.70
Triglycerides	159.56	157.14
VLDL	31.90	31.46
LDL	96.96	88.88

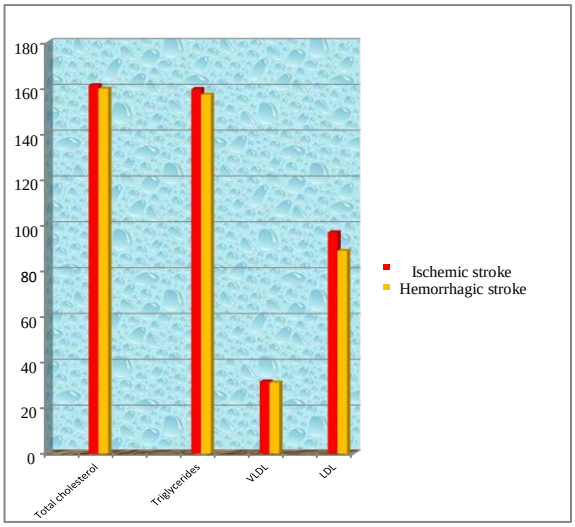
This table shows Mean Total Cholesterol, Triglycerides, VLDL and LDL whose values are higher in ischemic stroke than Hemorrhagic Stroke.

Bar Chart Showing HDL between Ischemic and Hemorrhagic Stroke



Bar Chart Showing Comparison of Lipid Profile between Ischemic and Hemorrhagic Stroke

Variables	Type of Stroke	N	Mean	SD	t	*P*
Age	Ischemic	50	53.02	13.097	-2.197	**0.030**
	Hemorrhagic	50	58.08	9.682		
Total Cholesterol	Ischemic	50	161.22	37.693	0.214	0.831
	Hemorrhagic	50	159.70	33.265		
HDL	Ischemic	50	32.36	7.819	-4.327	**0.000**
	Hemorrhagic	50	39.36	8.351		
TGL	Ischemic	50	159.56	66.748	0.221	0.825
	Hemorrhagic	50	157.14	39.039		
LDL	Ischemic	50	96.96	35.183	1.219	0.226
	Hemorrhagic	50	88.88	30.951		



Conclusion

This study shows that there is a significant decrease in HDL in ischemic stroke than Hemorrhagic stroke. As the Reverse Cholesterol Transport, Anti-inflammatory activity, Anti oxidative activity, Anti apoptotic activity, Endothelial repair, Anti thrombotic activity, Anti infectious activity of HDL are reduced due to decreased HDL leads to ischemic stroke than Hemorrhagic stroke.

Based on the results obtained from the present study HDL is used as an early predictor of atherosclerosis and ischemic stroke. By measuring the HDL earlier, early intervention measures by pharmaceutical means or by dietary means can be done to increase the HDL level to decrease the morbidity and mortality of stroke.

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