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TRIGLYCERIDES IN ISHEMIC VERSES HEMORRAGIC STROKE - A STUDY FROM OSMANIA GENERAL HOSPITAL

Medicine

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ABSTRACT

BACK GROUND:

Lipids abnormalities are major risk factors for coronary heart disease but it is also established as risk factor in cerebrovascular disease. The level of low-density lipoprotein (LDL) cholesterol has significant impact on the incidence of stroke, but elevated triglycerides may also confer risk .High triglyceride levels are associated with Ischemic strokes due to prothrombotic state Where as low triglyceride levels may be a cause for hemorrhagic strokes due to pro hemorrhagic state. **Objective**: To study the role of Triglycerides in Ischemic Verses Hemorrhagic stroke **Materials and methods:** This was an observational study conducted on 200 patients ,100 ischemic and 100 hemorrhagic strokes who were diagnosed with computed tomography (CT) and were admitted to Osmania General Hospital between 2014-2016.A detailed history, physical examination and outcome details were collected from hospital medical records. Data regarding fasting lipid profile, computed tomography (CT) or magnetic resonance imaging (MRI) brain reports were collected from medical records.NCEP/ATP-III guidelines and National Cholesterol Education Programme guide lines for Triglycerides were followed. **Results:** Majority of the patients with strokes were males,with (n= 65) ischemic strokes , (n=73) Hemorrhagic strokes. Most of the patients were of age > 50 years. Hypertension is the most common risk factor with (n=64) Ischemic strokes and (n= 76) Hemorrhagic strokes. Number of Diabetics in Ischemic strokes (n= 24) Hemorrhagic strokes (n = 20). Number of patients with hypertension and diabetes were in Ischemic strokes (n = 18) Hemorrhagic strokes (n=14).Regarding the Lipid profile data, patients with low HDL < 40 mg/dL presented with Ischemic stroke were (n=69)and with Hemorrhagic stroke were (n=56),patients with borderline high total cholesterol > 200 mg/dL who presented with Ischemic stroke were (n=24) and with Hemorrhagic strokes (n=23),patients with border line high LDL > 130 mg/dL who presented with Ischemic stroke wee (n=47) and with Hemorrhagic were (n=36), patients with Triglycerides < 150 mg/dL who presented with Ischemic stroke were (n=78) and with Hemorrhagic strokes were (n=83), patiewnts with Triglycerides 150 – 199 mg/dLpresented with Ischemic stroke were (n=14) and with Hemorrhagic stroke wee (n= 07), those with Triglycerides 200 – 499 mg/dL presented with Ischemic stroke were (n=08) and with Hemorrhagic stroke were (n=10), no patient with either ischemic or hemorrhagic stroke had Triglycerides more than 500 mg/dl. **CONCLUSION :** Present study concludes male sex is predominant in both types of strokes, mean age is lower in hemorrhagic stroke compared to ischemic strokes .Hypertension is the common risk factor in both types of strokes. number of patients with low HDL were 69 in ischemic stroke and 56 in hemorrhagic stroke, patients with normal range triglycerides <150mg/dl were 83 in hemorrhagic stroke, and 76 in ischemic stroke. Patients with border line high Total cholesterol levels (>200 mg/dl) are almost equal in both types strokes 24 in ischemic and 23 haemorrhagic stroke

KEYWORDS:

Triglycerides, ischemic stroke,intracerebral hemorrhage.

INTRODUCTION :-

A stroke is defined as abrupt onset of a neurologic deficit that is attributable to a focal vascular cause.[1] Stroke is the second leading cause of death worldwide and the third most common cause of disability adjusted life years in the world. In high income countries the age standardized incidence of stroke has reduced by 12% where as in India it has increased by 12%. The number of stroke cases will increase from 1081480 in the year 2000to 1667372 in 2015 (Indian Council of Medical Research ICMR Bulletin). [2,3]

Of patients presenting with a stroke, 85% would have sustained a cerebral infarction due to inadequate blood flow to part of the brain and the remainder will have had an intracerebral haemorrhage.[4]

In India rapid socio economic changes leading to changes in life style, work related stress, alterdfood habits ,hypertension,diabetes,hyperlipedemia coupled with increased life span ,high prevalence of metabolic syndrome has resulted in increased incidence of stroke. Stroke is broadly classified into Ischemic stroke and Intracerebral hemorrhage (ICH), one fifth of ischemic strokes occur in sleep, the most common mechanism in ischemic strokes is due to large artery atherosclerosis both intra and extra cranial [5,6.]

Haemorrhage is caused by bleeding directly into or around the brain; it produces neurologic symptoms by producing a mass effect on neural structures, from the toxic effects of blood itself, or by increasing intracranial pressure.[1] In India the percentage of haemorrhagic strokes may vary between different regions higher percentage of haemorrhagic strokes (30% to 40% of all strokes), in North-Eastern regions including Kolkata[.7]The most *important* modifiable Risk

factors for stroke include hypertension, atrial fibrillation, diabetes mellitus, cigarette smoking, and hyperlipidemia. Numerous clinical trials have also shown a marked reduction in stroke incidence with the use of cholesterol-lowering drugs. As in the case of coronary artery disease, the level of low-density lipoprotein (LDL) cholesterol has the most impact on the incidence of stroke but elevated triglycerides may also confer risk[8]

NCEP/ATP-III guidelines[9] and National Cholesterol Education Programme Guidelines for Triglycerides [10]are followed for lipid abnormalities as given in the chart 1 and 2**.**

CHART :1

ATP III CLASSIFICATION OF LDL, TOATAL CHOLESTEROL AND HDL CHOLESTEROL(mg/dl)8	
LDL CHOLESTEROL	
<100	Optimal
100-129	Near Optimal/ Above Optimal
130-159	Borderline High
160-189	High
≥190	Very High
TOTAL CHOLESTEROL	
<200	Desirable
200-239	Borderline High

≥240	High	
HDL CHOLESTEROL		
<40	Low	
≥60	High	

National Cholesterol Education Programme Guidelines for Triglycerides9		
<150	Normal range	No risk
150 -199	Slightly above normal, border line high	normal
200-499	High	Some risk
500or above	Very high	High risk

MATERIALAND METHODS:

This is an observational study conducted on 200 patients admitted with ischemic and hemorrhagic strokes to Osmania General Hospital from 2014-2016. Details such as history, physical examination, outcome, fasting lipid profile, computed tomography (CT) or magnetic resonance imaging (MRI) brain reports were collected from the hospital medical records. NCEP/ATP-III guidelines and National Cholesterol Education Programme guide lines for Triglycerides were followed.

Results: Present study includes diagnosed cases of 100 Ischemic, 100 Hemorrhagic strokes. In ischemic strokes male patients were n= 65, female patients were n= 35,) in hemorrhagic strokes male patients were n= 73, female patients were n= 27. Most of the patients were of age > 50 years. Most of them were hypertensive with Ischemic stroke (n=64), Hemorrhagic stroke (n= 76). Number of Diabetics with Ischemic strokes (n= 24) Hemorrhagic stroke were (n = 20). Number of patients with hypertension and diabetes with Ischemic stroke were (n = 18) with Hemorrhagic stroke were (n=14) as shown in Table 1 (fig 1). Lipid profile abnormalities include Patients with low HDL < 40 mg/dL with Ischemic stroke were (n=69) with Hemorrhagic were (n=56), patients with total cholesterol > 200 mg/dL with Ischemic stroke were (n=24) with Hemorrhagic stroke were (n=23), patients with High LDL > 130 mg/dL who presented with Ischemic stroke were (n=47) and with Hemorrhagic were (n=36), presented with Triglycerids < 150 mg/dL with Ischemic stroke (n=78) with Hemorrhagic were (n=83), who presented with Triglycerides 150 – 199 mg/dL with Ischemic stroke were (n=14) with Hemorrhagic were (n=07), those with Triglycerides 200 – 499 mg/dL presented with Ischemic stroke were (n=08)with Hemorrhagic were (n=10), No one Triglycerides above 500 is nil in both Ischemic & Hemorrhagic shown in Table – 2 (fig 2)

Table- 1

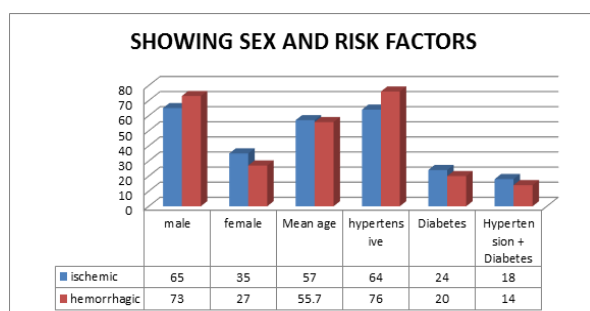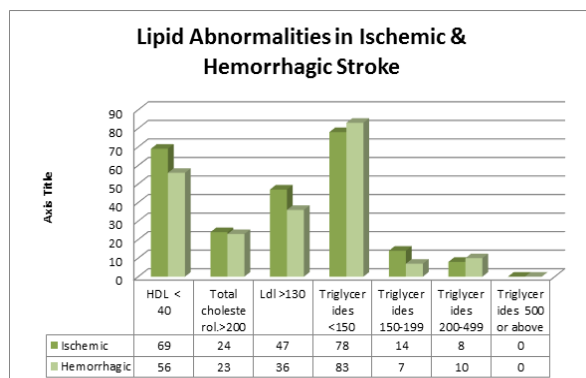|	ischemic	Hemorrhagic
Male	65	73
Female	35	27
Mean age	57	55.7
Hypertensive	64	76
Diabetes	24	20
Hypertension + Diabetes	18	14

SHOWING SEX AND RISK FACTORS

	male	female	Mean age	hypertensive	Diabetes	Hypertension + Diabetes
ischemic	65	35	57	64	24	18
hemorrhagic	73	27	55.7	76	20	14

figure 1

Risk Factors	Ischemic	Hemorrhagic
HDL < 40	69	56
Total cholesterol.>200	24	23
Ldl >130	47	36
Triglycerides <150	78	83
Triglycerides 150-199	14	7
Triglycerides 200-499	8	10
Triglycerides 500 or above	0	0

Table 2

Lipid Abnormalities in Ischemic & Hemorrhagic Stroke

	HDL < 40	Total cholesterol.>200	Ldl >130	Triglycerides <150	Triglycerides 150-199	Triglycerides 200-499	Triglycerides 500 or above
Ischemic	69	24	47	78	14	8	0
Hemorrhagic	56	23	36	83	7	10	0

DISCUSSION

Dyslipidemia is elevation of plasma cholesterol, triglycerides (TGs), or both, or a low high-density lipoprotein level that contributes to the development of atherosclerosis11.

Dyslipidemia is a primary major risk factor for CAD and ischemic stroke12 which causes insulin resistance resulting in increased levels of plasma triglycerides and LDL-c and a decreased concentration of HDL-c, as an important risk factor for peripheral vascular disease13 stroke, and CAD14,15

For coronary heart disease lipid abnormalities are major risk factors but recently it was established as risk factor in cerebrovascular disease also.16,Higher levels of total cholesterol is associated with increases in ischemic stroke rates and lowering cholesterol may decrease carotid atheroma thus resulting in a decline in carotid territory infarcts. 17,18 The Asia Pacific Cohort Studies Collaboration found a 25% increase in ischemic stroke rates for every 1 mmol/L increase in total cholesterol. The Multiple Risk Factor Intervention Trial (MRFIT) demonstrated that mortality risk from non-hemorrhagic stroke increased proportionately with serum cholesterol19. Conversely, negative association was found between hemorrhagic stroke and cholesterol levels below 200 mg/dl: the lower the blood cholesterol level the greater risk of hemorrhagic stroke., ,20

Cholesterol and fatty acids are being essential components of cell membrane It has been hypothesized that very low cholesterol levels may contribute to the development of a fragile endothelium which is prone to leakage and rupture21. Several studies have suggested that high triglyceride levels leads to a prothrombotic state because they are positively correlated with the vitamin K-dependent coagulation factors VII and IX, and with plasminogen activator inhibitor and blood viscosity.22,23,24 Likewise, that low triglyceride levels may result in a prohemorrhagic state.

High LDL is usually held responsible for cerebrovascular accidents. Present study showed significant number of patients were with low HDL,and low triglyserides in both types of stroke similar to a study by Cynthia et al on dyslipedemia in stroke. Hyper triglyceredemia was present only in small number of patients 5 to 6% similar to Cynthia et (7%) . Frequent fish consumption may have protective effect and inverse relation of risk of stroke 25

CONCLUSION

Present study concludes males were predominant in both types of strokes, mean age lower in hemorrhagic stroke , Hypertension is the common risk factor in both types of strokes. Numbe of patients with

low Hdl more in ischemic stroke, high total cholerstrol >200mg is more in ischemic group, low triglycerides <100mg/dl more in hemorrhagic stroke. In both types of strokes low HDL is common risk factor which can be improved by exercise. Triglyderides were normal range in both ischemic and hemorrhagic strokes.

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