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"Correlation between Serum Triglyceride Levels and Severity of Stroke"

Dr. Ramya Devulapalli, Dr. S. Srinivasmd
Professor of general medicine institution:rangaraya medical college, kakinada.

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I. INTRODUCTION

• Among all the neurologic diseases of adult life, the stroke clearly rank first in frequency and importance accounting upto 20% of all central nervous system disorders, in the urban sectors of India.
• Stroke is defined as an abrupt neurologic deficit that is attributable to focal vascular cause. Risk factors for stroke include hypertension, carotid stenosis, atrial myxomas , smoking, hyperlipidemia, diabetes, myocardial infarction and atrial fibrillation.
• observational studies have incontrovertibly established hyperlipidemia as an independent risk factor for coronary artery disease.
• The link between hyperlipidemia and stroke, was more difficult to establish.
• To investigate a possible etiologic relationship between hyperlipidemia and stroke, it became essential to distinguish ischemic from hemorrhagic stroke.
• It now appears likely that hyperlipidemia is an independent risk factor for ischemic stroke.
• The potential biological mechanism responsible for association between TG level and stroke severity is unknown.
• This study is undertaken to correlate serum triglyceride levels on admission with severity of stroke as measured by Scandinavian stroke scale.

II. AIMS AND OBJECTIVES

• To identify if serum triglyceride levels on admission predict stroke severity

III. MATERIALS AND METHODS

SOURCE OF DATA

• Sixty consecutive patients presenting with acute ischemic stroke, occurring within 24 hours, confirmed by CT scan admitted in GGH Kakinada from November 2019 to February 2020 were included in this study and in each patient fasting serum TG levels were estimated.

INCLUSION CRITERIA

• Patients with first ever ischemic stroke occurring within 24 hours, confirmed by CT scan, admitted to GGH Kakinada between November 2019 to february 2020

EXCLUSION CRITERIA

• Patients admitted to the hospital > 24 hours after stroke onset.
• Previous history of stroke
• Previous history of transient ischemic attack
• Haemorrhagic stroke
• Patients with space occupying lesions
• Patients with CVT
• Stroke severity on admission was assessed using Scandinavian stroke scale (SSS).
• The patients were divided into 2 groups: those with severe stroke (SSS ≤25) and those with mild/moderate stroke (SSS >25)
• In addition to routine investigations as per standard protocol in the evaluation of stroke patient, fasting serum triglyceride level and total cholesterol were measured between 12 and 36 hours after stroke onset using commercially available kits.
• Hypertriglyceridemia was diagnosed if TG >2.3 mmol/l.
• Patient were followed up till they were discharged from the hospital.

IV. STATISTICAL ANALYSIS

STATISTICAL METHOD:

1. Diagrammatic representation.
2. Mean ± SD
3. X2 test

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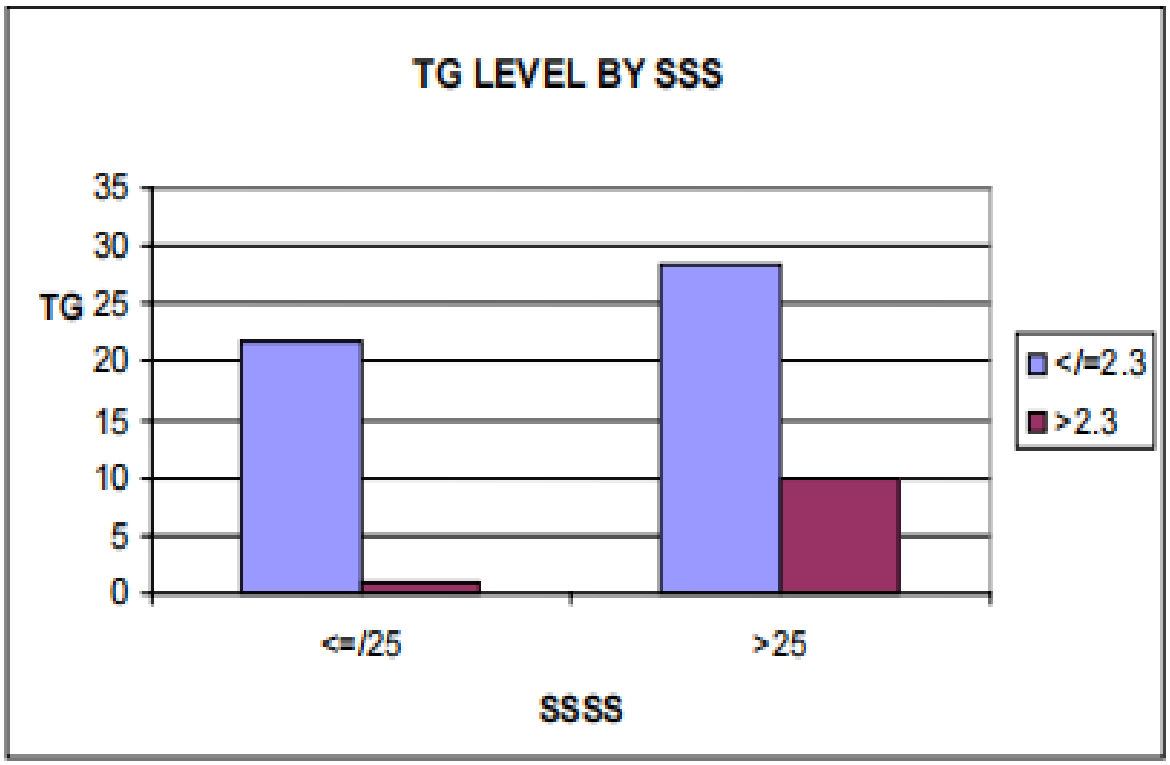
V. RESULTS

Association between TG Level and SSS

		TG Level(mmol/l)			
		<_2.3	>_2.3	Total	X2VALUE
SSS	<_25	21	1	22	
	>25	28	10	38	4.41
	Total	49	11	60	

In this study the number of patients with severe stroke (SSS≤25) were 22 of which 21 had TG≤2.3mmol/l and only 1 patient had TG>2.3mmol/l.
The number of patients with mild to moderate stroke (SSS>25) were 38 of which 28 had TG≤2.3mmol/l and 10 patients had TG>2.3mmol/l.
Conclusion: There is an association between TG Level and SSS at 5% level of significance

Bar diagram showing association between TG Level and SSS



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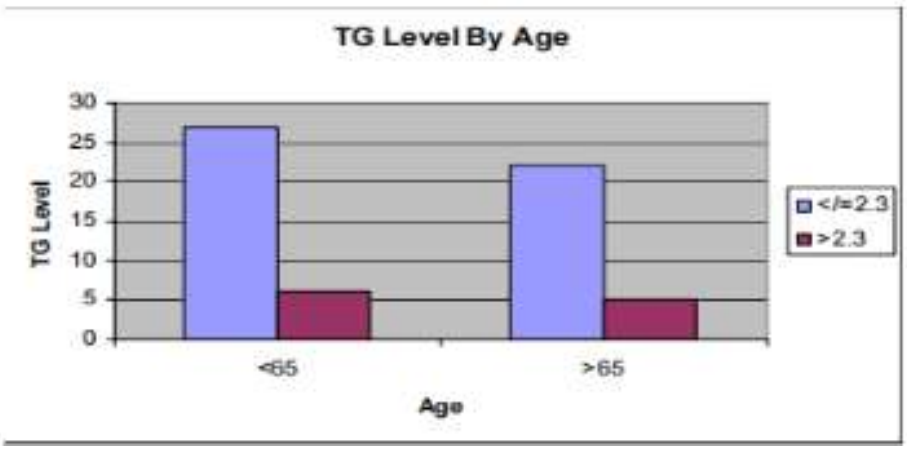
Association between TG Level and age

		TGLevel (mmol/l)			
		<_2.3	>2.3	TOTAL	X2VALUE
AGE	<65	27	6	33	
	>_65	22	5	27	0.001
	TOTAL	49	11	60	

• Conclusion: There is no association between TG Level and age at 5% level of significance.



Association between TG Level and hypertension

		TG Level(mmol/l)			
		<_2.3	>2.3	TOTAL	X2VALUE
HTN	YES	39	9	48	
	NO	10	2	12	0.017
	TOTAL	49	11	60	

Conclusion: There is no association between TG Level and hypertension (HTN) at 5% level of significance.

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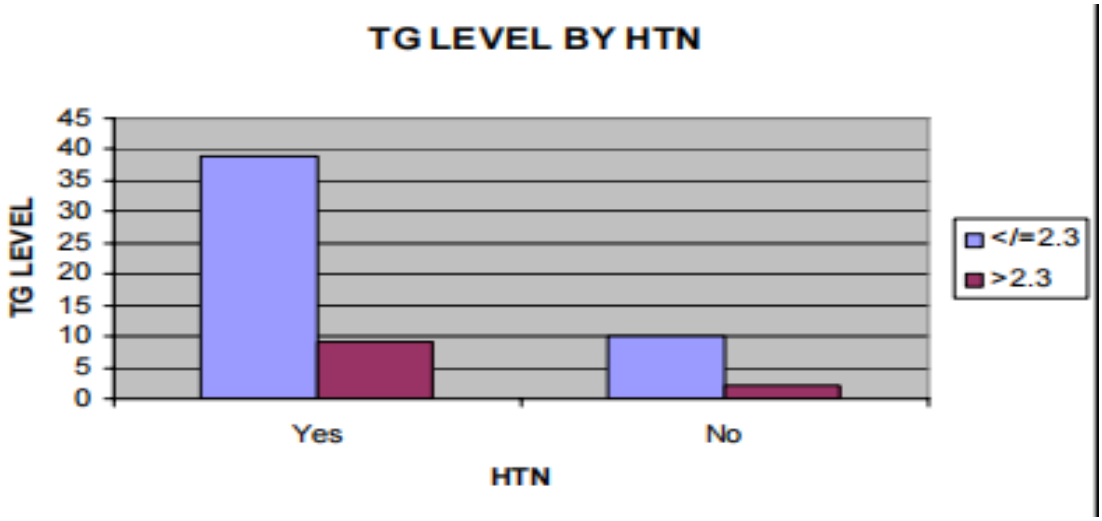
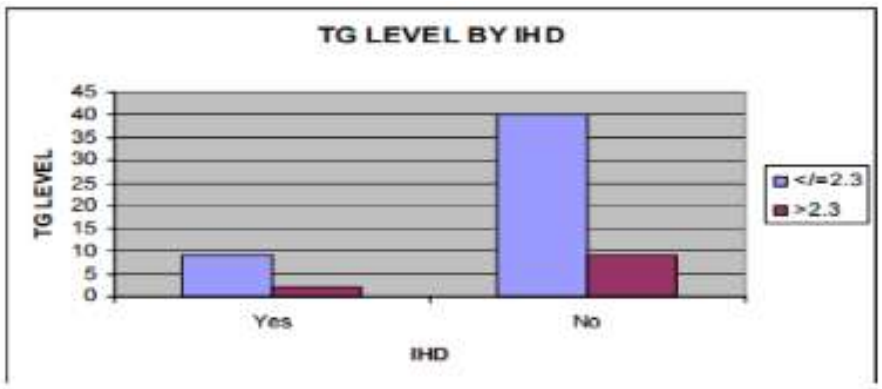


Association between TG Level and IHD

		TGLEVEL (mmo/l)			
		<2.3	>2.3	total	X2value
IHD	Yes	9	2	11	
	No	40	9	49	0.008
	total	49	11	60	

Conclusion: These differences were not statistically significant at 5% level of significance.



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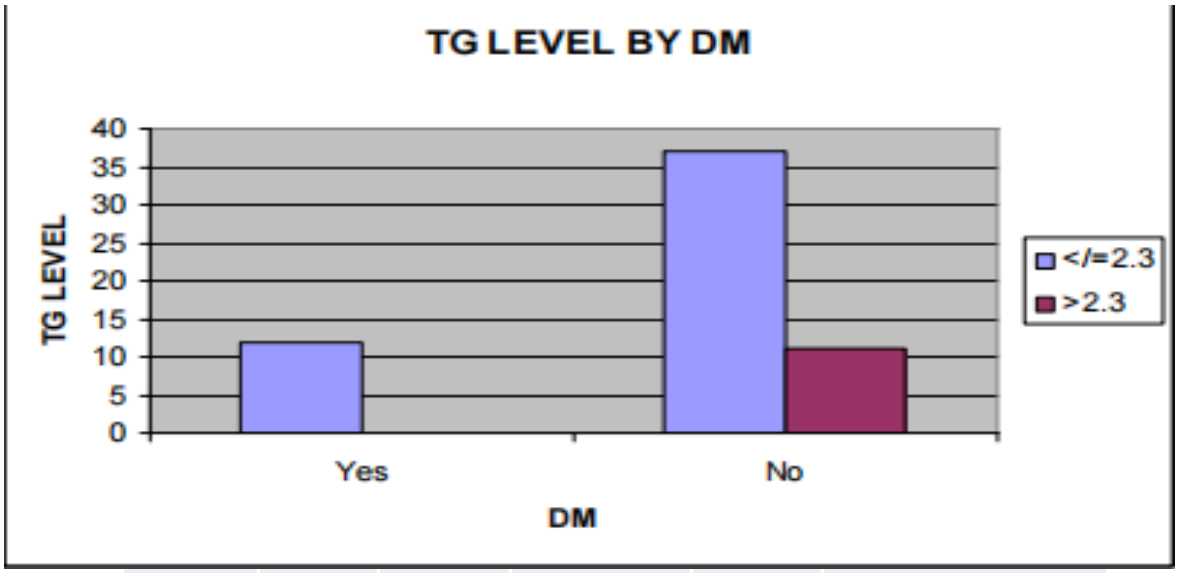
Association between TG Level and DM

		TGLEVEL (mmol/l)			
		<_2.3	>2.3	TOTAL	X2VALUE
DM	YES	12	0	12	
	NO	37	11	48	0.0092
	TOTAL	49	11	60	

Conclusion: There is no association between TG Level and DM at 5% level of significance.



Association between TG Level and Smoking.

			TG LEVEL (MMOL/L)		
		<_2.3	>2.3	total	X2 value
SMOKING	Yes	9	5	14	
	No	40	6	46	3.56
	total	49	11	60	

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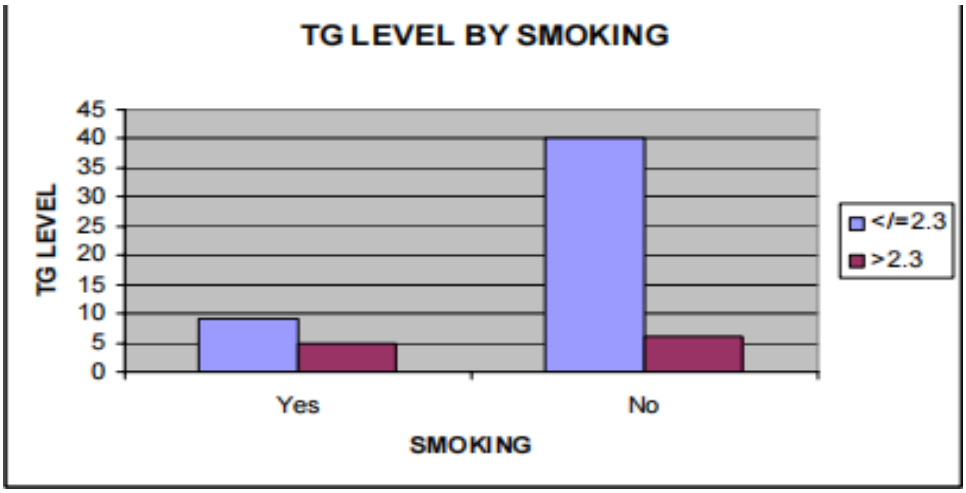
Conclusion: There is no association betweenTG Level and Smoking at 5% level of significance.



VI. DISCUSSION

TRIGLYCERIDES LEVELS AND SEVERITY OF STROKE :

• The present study involved 60 patients of acute ischemic stroke.
• The mean triglyceride levels amongst them is 1.56 ±0.86mmol/l.
• But the mean triglyceride levels amongst patients with severe stroke (SSS≤25) was found to be 1.002+/-0.385 mmol/l and that in patients with mild to moderate stroke(SSS>25) was 1.790+/-0.887 mmol/l.
• There is a statistically significant difference between TG levels which are associated with lower and higher values of SSS(severe and mild to moderate stroke respectively) with p value being 0.00006.

AGE AND TRIGLYCERIDE LEVELS

• Triglycerides increase gradually in men until about age 50 years and then decline slightly but in women, they continue to increase with age.
• The prevalence of mild hypertriglyceridemia is slightly more in men beginning at age 30 years and women starting at age 60 years.
• The present study did not show any statistically significant association between TG Level and age.

SEX AND TRIGLYCERIDE LEVELS

• In the Prospective Cardiovascular Munster study (PROCAM), a large observational study, mild hypertriglyceridemia (triglycerides >200 mg/dL) was more prevalent in men (18.6%) than in women (4.2%).
• However, in the present study no statistically significant

SMOKING AND TRIGLYCERIDE LEVELS

• Cigarette smoking has been found to increase the concentrations of triglycerides and lowers the concentration of HDL cholesterol.
• These changes were found to contribute towards the atherogenic potential of cigarette smoking.
• Our study also did not show any significant association between TG level and Smoking.

OBESITY AND TRIGLYCERIDE LEVELS

• Mild-to-moderate hypertriglyceridemia is common in obese patients, largely secondary to reduced efficacy of LPL and overproduction of VLDL.
• But this study did not show any association between TG Level and obesity.

IHD AND TRIGLYCERIDE LEVELS

• The role of triglycerides as a risk factor of ischemic heart disease (IHD) remains controversial.
• However, the present study did not show any significant association between TG Level and IHD.

HYPERTENSION AND TRIGLYCERIDE LEVELS

• Essential hypertension is frequently associated with metabolic abnormalities including glucose intolerance, hypertriglyceridemia and enhanced postprandial lipemia.
• But this study failed to show association between TG level and hypertension.

DIABETES AND TRIGLYCERIDE LEVELS

• Uncontrolled type 1 and type 2 diabetes mellitus, is one of the most common causes of hypertriglyceridemia, and is often severe in patients presenting with ketosis.

• But this study did not show any association between TG level and diabetes mellitus.

VII. CONCLUSION

• In this study, mean serum triglyceride levels were significantly lower in patients with severe stroke when compared to the levels in patients with mild to moderate stroke.
• As per this study smoking, obesity, hypertension, IHD, diabetes mellitus, age and sex of an individual do not influence levels of serum triglyceride levels.