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Study of Hypertriglyceridemia in Young Adults

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Abstract: Hypertriglyceridemia is a commonly encountered lipid abnormality mostly associated with other lipid and metabolic derangements. It is a cause of concern as it is associated with coronary artery disease and pancreatitis. The aim of the study is to estimate the levels of serum triglyceride among young adults. This cross-sectional study was conducted at the Department of Biochemistry, Central Laboratory, Sree Balaji Medical College and Hospital, Chromepet, Chennai during April-July 2016. The fasting blood samples were collected from 250 healthy volunteers in the age group of 20 – 30 years using vacuum system. Samples for lipid profile was collected in red topped plain vacuum tube. The samples were centrifuged at 3000 rpm for 15 minutes. The samples were then analysed in Mindray BS 390 automated analyser. Glycerokinase Peroxidase-Peroxidase method was used to determine triglyceride concentration. The data were analysed using SPSS package. The prevalence of hypertriglyceridemia noted in the study population was 30%. Severe hypertriglyceridemia is a high-risk factor for developing pancreatitis and coronary artery disease, which is could be due to lifestyle changes such as high fat diet, alcoholism, obesity and genetic factors. Hence it is necessary to keep a regular check on the triglyceride values in young adults to reduce the morbidity of hypertriglyceridemia.

Keywords: Hypertriglyceridemia, atherosclerotic cardiovascular disease

INTRODUCTION

Atherosclerotic cardiovascular disease (ACD) is the leading cause of mortality in the world [1]. It is an inflammatory artery disease caused by lipids and other metabolic derangements. As per the Global Health Observatory data of 2015, WHO has listed IHD and stroke as the world's first and second causes of death respectively. Elevated triglycerides are now considered as an independent risk factor for coronary heart disease and a major risk for acute pancreatitis, especially when TGL levels >1000 mg/dl [2]. Hypertriglyceridemia is a component of atherogenic dyslipidaemia and indicate the presence of other conditions like metabolic syndrome or type 2 diabetes mellitus [3]. Elevated TGL is associated with an increased risk of CVD esp. when the HDL is low or the LDL is high. Hyperlipidaemia has been defined by the Fredrickson classification, which is based on beta-quantification**,** a process involving ultracentrifugation followed by electrophoresis [4]. The United States Preventive Services Task Force (USPSTF) report recommends that men aged 20 to 35 years and women aged 20 to 45 years should be screened for hyperlipidemia if they have other risk factors for heart disease like smoking, diabetes, family history of heart disease or high blood pressure [5]. Current ATP III guidelines recommend lipid screening in all adults >20years of age to be tested once in 5 years. In this study, we have considered such asymptomatic young individuals (20-40 years of age) to ascertain the significance of hypertriglyceridemia.

AIM

Primary

Estimate the serum triglyceride level among adults of 20-40 years.

Secondary

To find the correlation between the risk factorsand high triglycerides.

MATERIALS AND METHODS

Cross sectional study done in Central Laboratory, Department of Biochemistry, Sree Balaji Medical College and Hospital, Chromepet, June-August 2016.Sampleswere collected after taking brief history based on lifestyle and dietary habits of the individual. Fasting lipid profile samples were taken from 250 asymptomatic healthy volunteers were collected in plain red topped vacuum tubes by vacutainer system and analysed by Mindray BS390fully automated analyser. Glycerokinase Peroxidase-Peroxidase method was used to determine triglyceride concentration. Data was

categorised based on demographics (Age, Gender), Lifestyle related factors (smoking habits, alcohol consumption, dietary factors and physical activity) obesity and family history of dyslipidaemia.

Inclusion Criteria

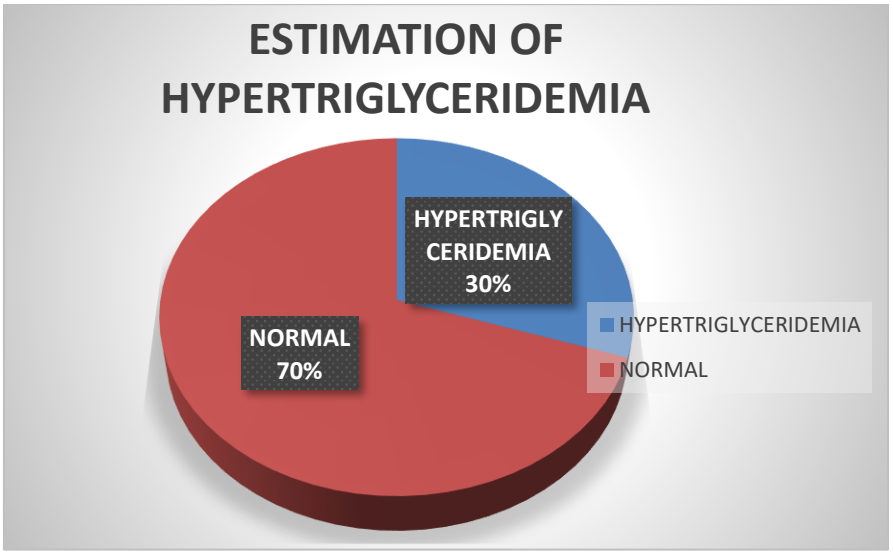
20-40 years old asymptomatic adults

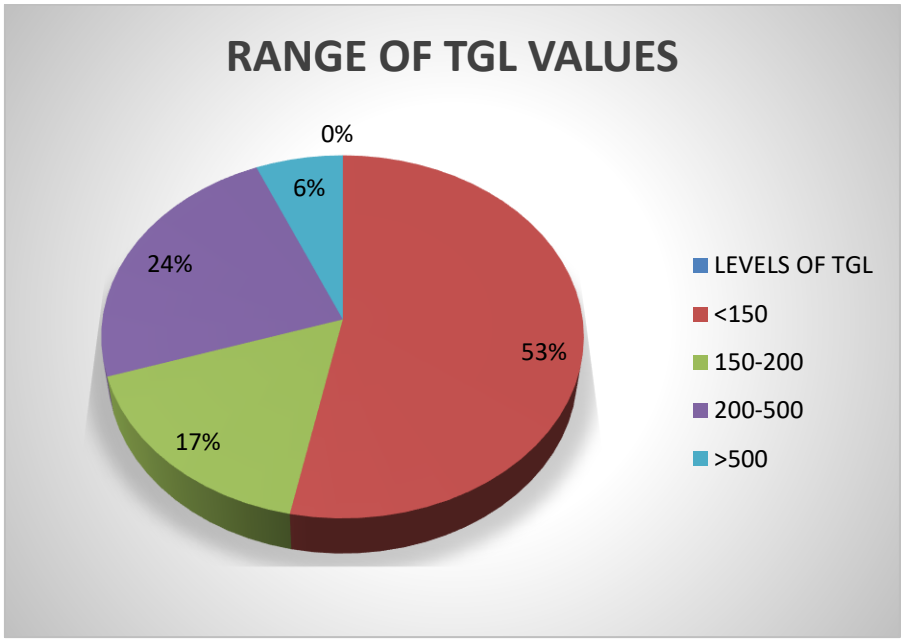
Exclusion Criteria

Known cases of diabetes mellitus, hypothyroidism and IHD

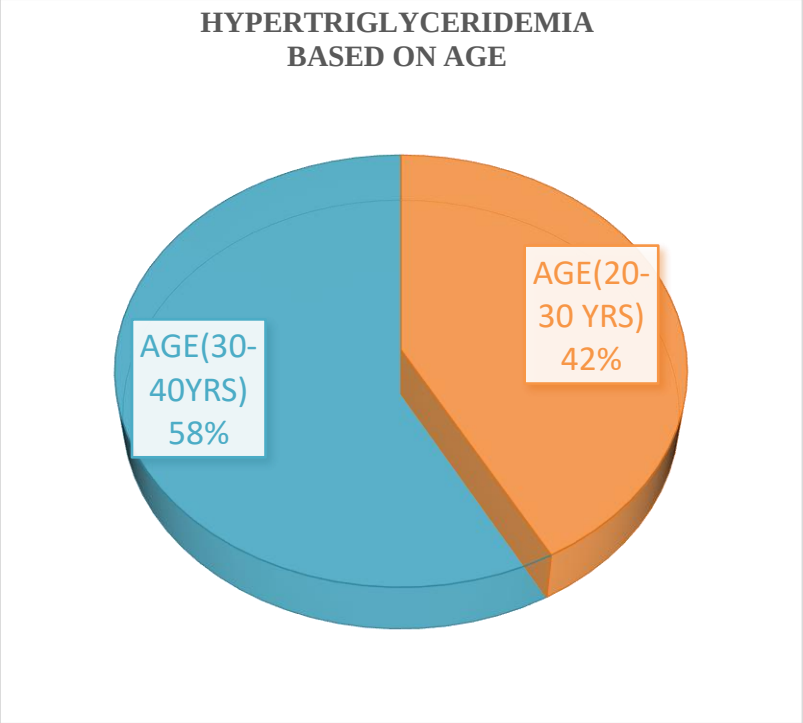
RESULTS

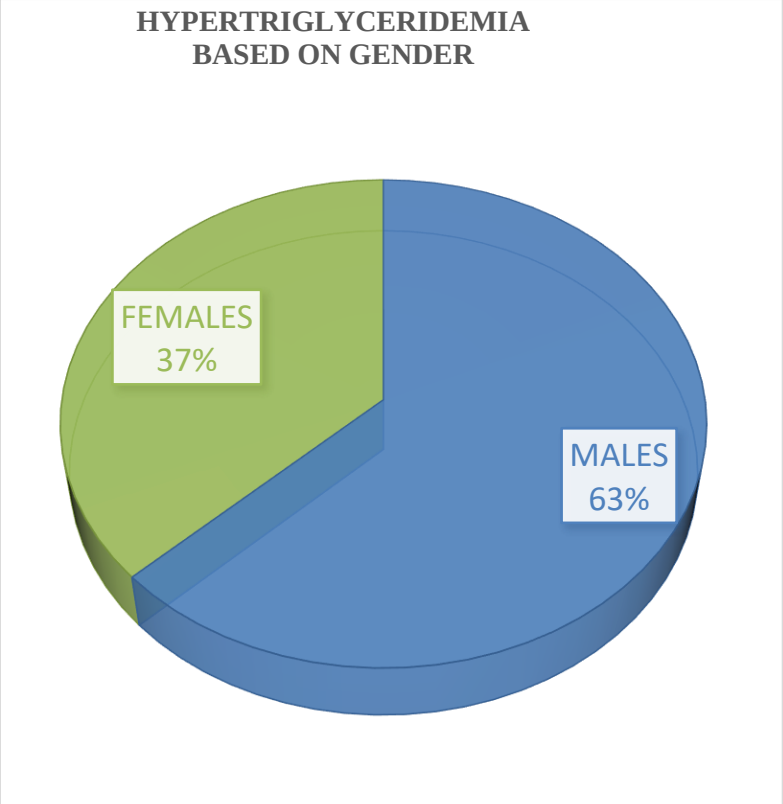
The prevalence of hypertriglyceridemia in 20-40 years old population was found to be **29.8**% (Cut off value<200mg/dl).

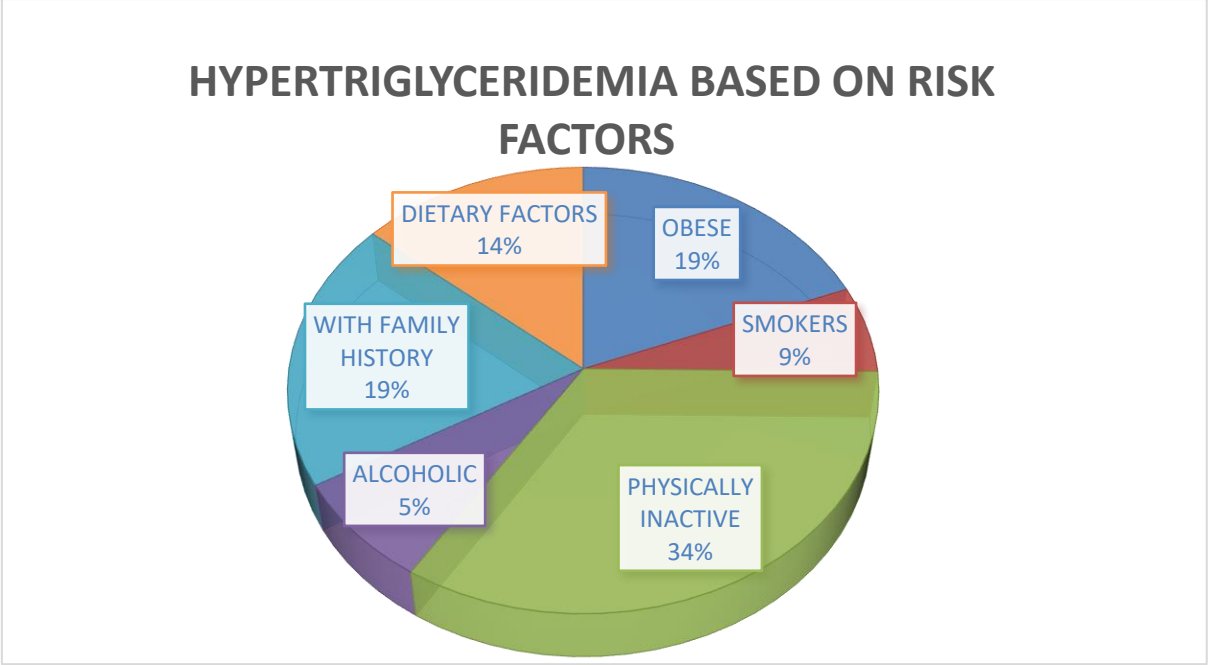




The study showed that hypertriglyceridemia was more common in males (63%) than women and that it increased with advances in age. Hypertriglyceridemia was found to be more elevated after 30 years than 20-30 years (58%).


HYPERTRIGLYCERIDEMIA
BASED ON AGE
AGE(20-30 YRS) 42%
AGE(30-40YRS) 58%


HYPERTRIGLYCERIDEMIA
BASED ON GENDER
FEMALES 37%
MALES 63%



Among our study population, 34% of hypertriglyceridemic patients were physically inactive, 19% had family history of hypercholesterolemia, 19% were obese, 14% due to dietary factors, 9% were alcoholics and 5% were smokers.

DISCUSSION

High TGL values is a risk factor for developing CAD and Pancreatitis (>1000mg/dl).High TGL values are mostly associated with increased LDL-C which is highly atherogenic. Overall prevalence of hypertriglyceridemia in various studies ranged from 10-75%.In our study, the prevalence was found to be 29.8% out of which 63% were among males and 58% among 30-40 years old adults which was correlating to the findings of Soysal *et al*. [6]. Our results were consistent with the previous cross sectional study conducted in urban population who attended annual health check-up in P.D. Hinduja National Hospital [7] and that of Prevalence of Coronary Artery Disease and Risk Factors in urban population of Tirupati [8].

References have shown that our diets are rich in saturated fats [7]. Besides, it includes overcooking of food which destroys nutrients like folate. Deep frying, and refrying the same oil forms trans fatty acids which leads to dyslipidaemia [9]. Diets with high fat and calorie intake are a contributory factor in hypertriglyceridemia [10]. Smoking increases the level of triglycerides esp. post prandial TGL levels and further increase the risk of CAD [11]. Ingestion of alcohol causes an increase in the synthesis of (TGs) and TG-rich lipoproteins in the liver [12]. Alcohol causes elevated TGL values but the risk is more when it is combined with obesity. TGL values drop when alcohol consumption is stopped [13]. Physical inactivity has a powerful effect on suppressing lipoprotein lipase (LPL) activity in skeletal muscle, the rate-limiting enzyme for hydrolysis of triglyceride (TG)-rich lipoproteins [14] which explains how physical inactivity leads to hypertriglyceridemia. Hypertriglyceridemia (>1000mg/dl) is mainly seen in familial hyperlipoproteinemia type I, IIb, III, IV and V as per modified Fredrickson's classification.

CONCLUSION

CVD is not only becoming common, it is affecting more and more of the younger population. This has marked economic implications as the young working classes are affected. Hence it is necessary to keep a regular check on the triglyceride values in young adults to reduce the morbidity of hypertriglyceridemia. Severe hypertriglyceridemia is a high-risk factor for developing pancreatitis and coronary artery disease, which could be due to lifestyle changes such as high fat and calorie diet, smoking, alcoholism, obesity, lack of physical exercise and genetic factors. Combination lifestyle therapies i.e., enhanced physical activity and dietary modification and therapeutic intervention [15, 16] would help in treatment and management of hypertriglyceridemia. This calls upon the need for awareness, enhanced physical activity, dietary modifications and therapeutic interventions for management of hypertriglyceridemia.

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