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TRIGLYCERIDES VARIATIONS AMONG THE BLOOD OF ALCOHOLIC AND NON-ALCOHOLIC PEOPLES FROM DIFFERENT STATES OF INDIA

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Author PKV designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors RS and JSC managed the analyses of the study. Authors JKS and MLB managed the literature searches. All authors read and approved the final manuscript.

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Original Research Article

ABSTRACT

Diabetes is a set of various disorders characterizes by hyperglycemia and glucose intolerance, due to the insufficiency of insulin and/or impaired effectiveness of insulin action. It is observed that every population in this world suffering from Diabetes Mellitus (DM) and other forms of glucose intolerance, mainly Impaired Glucose Tolerance (IGT). The present study estimates the Triglycerides variations among the blood of alcoholic and non-alcoholic peoples from different states of India. The study includes North Indian states such as Bihar, Uttar Pradesh, Uttrakhand, Himachal Pradesh, Punjab, Haryana and Rajasthan. Plasma Triglycerides level in female and male subjects of Bihar were found 182.63±32.24 and 143.52±11.18 respectively. The mean of Plasma Triglycerides Level in Uttar Pradesh Control nonalcoholic subjects was found to be 235.46±9.46 years. The difference in Plasma triglycerides in Rajasthan Control alcoholic and nonalcoholic subjects were 120.00±0.00 years (Mean ± SE) and 166.68±10.76 (Mean ± SE) respectively.

Keywords: Triglycerides; alcohol; diabetes mellitus; Impaired Glucose Tolerance.

1. INTRODUCTION

Diabetes is a set of various disorders characterizes by hyperglycemia and glucose intolerance, due to the insufficiency of insulin and/or impaired effectiveness of insulin action. It is observed that every population in this world suffering from Diabetes mellitus (DM) and other forms of glucose intolerance, mainly Impaired Glucose Tolerance (IGT). The incidence of diabetes increases globally due to lack of effective prevention and control programs WHO [1]. DM is classified on the basis of an etiology and clinical presentation of the disorder into three types: type 1 diabetes mellitus (T1DM), type 2 diabetes mellitus (T2DM) and gestational diabetes [2]. T1DM usually accounts for only a minority of the total burden of diabetes in a population; it is the predominant form of the disease in younger age groups in most high-income countries. T1DM is increasing in incidence in both rich and poor countries, and there is an indication of a shift towards T1DM developing in children at earlier ages [3].

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IGT is an asymptomatic condition defined by elevated (though not diabetic) levels of blood glucose two hours after a 75g oral glucose challenge. Along with impaired fasting glucose (IFG), it is now recognized as being a stage in the transition from normality to diabetes. Thus, individuals with IGT are at high risk of progressing to T2DM, although such progression is not inevitable, and probably over 30% of individuals with IGT will return to normal glucose tolerance over a period of several years [IDF diabetes atlas. IDF Executive Office, 2009]. The decision to include data on IGT was based on two major factors associated with its presence: it greatly increases the risk of developing diabetes [4] and it is associated with the development of cardiovascular disease [5], [6]. During the last two decades, the genetics of T2DM has been under extensive research. Studies on monozygotic twins and offspring of patients with T2DM and ethnic differences in the prevalence of T2DM have demonstrated that this disease has a strong genetic component [7], Newman et al. [8], Henkin et al. [9], Mills et al. [10], Poulsen et al. [11], Abate and Chandalia [12], Barnett et al. [13], Matsuda and Kuzuya [14], Medici et al. [8]. However, the mode of inheritance of T2DM is poorly understood with the exception of a few rare cases (< 1%) with mutations in INS or IR genes, therefore, it is likely that there are several susceptibility genes that interact with environmental factors [15].

2. MATERIALS AND METHODS

For the present study North Indian population (Fig. 1) were selected. These North Indian states were included in this study were Bihar, Uttar Pradesh, Uttrakhand, Himachal Pradesh, Punjab, Haryana and Rajasthan.

For this study T2DM patients and apparently healthy control subjects with the following criteria were targeted:

1. Non-insulin dependent patients with fasting blood glucose level above 110 mg/dl, previously diagnosed and on medication of diabetes were considered as diabetic type-2 patients.
2. Subjects with fasting blood glucose level less than 110 mg/dl and no history of diabetes were considered as a control group.
3. The type 2 diabetic patients taking Insulin treatment were excluded from the study.

A total of 511 blood samples from T2DM and healthy control subjects (250 T2DM and 261 controls) have been collected from following regions (Table 1).

2.1 Procedure for Estimation of Triglycerides

Triglycerides were estimated by GPO/PAP method, using a commercial kit.

Procedure: Reactions were set up in 3 separate tubes as shown in Table 2.

Calculation: Plasma triglycerides concentration in the samples was calculated using the following formula:

$$Triglycerides\ \left(\frac{mg}{dl}\right) = \frac{\text{Absorbance of Sample}}{\text{Absorbance of Standard}} X\ \text{Concentration of Standard.}$$

Table 1. State-wise details of a number of samples collected in diabetic and control group

States	No. of samples	Diabetic	Control
Uttar Pradesh	47	25	22
Rajasthan	55	28	27
Uttrakhand	50	25	25
Himachal Pradesh	55	25	30
Punjab	51	26	25
Haryana	186	87	99
Bihar	67	34	33
Total sample	511	250	261

Table 2. Mixed well and incubate for 5 minutes at 37°C. Measure the absorbance of standard and samples against reagent blank at 505 nm

	Blank	Standard	Plasma
Working Reagent	1000µl	1000µl	1000µl
Distilled Water	10µl	-	-
Standard	-	10µl (200 mg/dl)	-
Sample	-	-	10µl

Fig. 1. Map of India and states from where study sample was collected

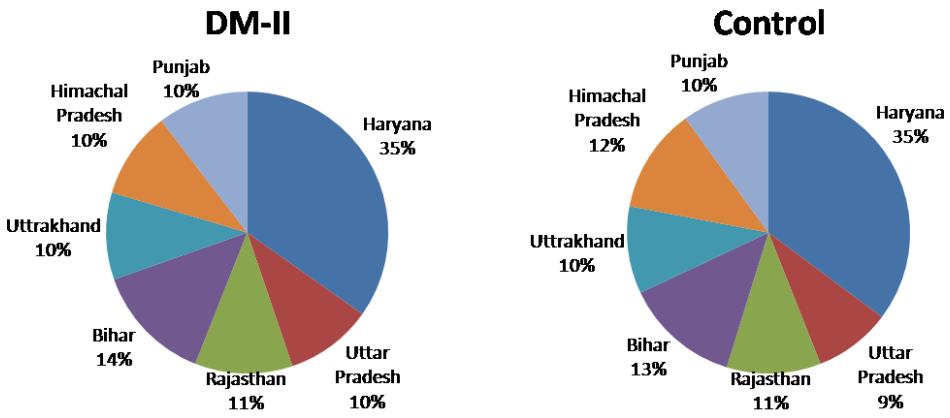


Fig. 2. Pie diagram shows % of subjects belongs to different Indian states

3. RESULTS AND DISCUSSION

During the present investigation the difference in plasma Triglycerides level of alcoholic and Nonalcoholic groups of Bihar DM-II subjects was found to be 151.30 ± 18.70 (Mean ± SE) and 151.62 ± 12.80 (Mean ± SE) respectively. Further, the difference in mean of Plasma Triglycerides Level in Bihar Control alcoholic and Nonalcoholic subjects were found to be 144.0±17.34 years (Mean ± SE) and 169.03±24.77 (Mean ± SE) respectively. As far as Haryana state was considered, the difference in mean of Plasma Triglycerides in Haryana DM-II alcoholic and nonalcoholic subjects were 207.60±31.29 years (Mean ± SE) and 217.92±11.07 (Mean ± SE) respectively. The difference plasma triglycerides level in Haryana Control alcoholic and nonalcoholic subjects were found to be 265.13±5.79 years (Mean ± SE) and 176.89±10.43 (Mean ± SE) respectively. The triglycerides variation of nonalcoholic and alcoholic groups of Himachal Pradesh DM-II subjects were (Mean ± SE) 177.01±16.67 and 91.00±0.00 respectively. The difference in mean of Plasma Triglycerides Level in Himachal Pradesh Control alcoholic and nonalcoholic subjects were 127.30±0.00 years (Mean ± SE) and 195.99±23.41 (Mean ± SE) respectively. The mean of Plasma Triglycerides Level of nonalcoholic and alcoholic DM-II subjects from Punjab were 228.00±0.00 (Mean ± SE) 195.90±13.42 years (Mean ± SE) respectively. The mean of Plasma Triglycerides Level in Punjab control nonalcoholic subjects was 172.69±13.62 years (Mean ± SE) respectively. The plasma triglycerides of different groups of Rajasthan Non-alcoholic DM-II subjects were (Mean ± SE) 173.96±8.40. The difference in Plasma triglycerides in Rajasthan Control alcoholic and nonalcoholic subjects were 120.00±0.00 years (Mean ± SE) and 166.68±10.76 (Mean ± SE) respectively. The mean of Plasma Triglycerides Level in Uttrakhand DM-II nonalcoholic subjects was 222.26±37.64 years (Mean ± SE). The mean of Plasma Triglycerides Level in Uttrakhand Control nonalcoholic subjects was 162.46±17.22 years (Mean ± SE). The difference in mean of Plasma Triglycerides Level in Uttar Pradesh DM-II nonalcoholic and alcoholic subjects were 224.63±11.06 years (Mean ± SE) and 204.00±0.00 (Mean ± SE) respectively. The mean of Plasma Triglycerides Level in Uttar Pradesh Control nonalcoholic subjects was found to be 235.46±9.46 years (Mean ± SE).

Plasma Triglycerides level in female and male subjects of Bihar were found 182.63±32.24 and 143.52±11.18 respectively. Our results were consistent of Ogbara *et al.* in Nigerian population and Oluyomi *et al.* in Nigerian population, while opposite with Mahato et al. [16]. in Nepali population, Uttra et al. [17] in Pakistani population. Plasma Triglycerides level in the female and male diabetic subject of Haryana were found to be 208.25±16.98 and 222.92±13.08. Our results were consistent with Mahato et al. [16] and Uttra et al. while opposite to that of Ogbara et al. and Oluyomi et al. Plasma Triglycerides level diabetic female and male subjects of Himachal Pradesh were found to be 188.29±22.41 and 147.39±21.10 respectively. Our result was consistent with Ogbara *et al.* in Nigerian population and Oluyomi et al. in Nigerian population, while opposite from Mahato et al. [16] findings in Nepali population and Uttra et al. findings in Pakistani population. Plasma Triglycerides level of Rajasthan DM-II female and male subject were171.90± 14.22 and 175.11± 10.71. Our results were consistent with Mahto et al. work in Nepali population and Uttra et al. studies in Pakistani population while goes opposite to Ogbara et al. works in the Nigerian population. Plasma Triglycerides level of Uttarkhand diabetic female and male subjects was found to be 195.15± 45.35 and 240.33± 55.75. Our these results were consistent with Mahato et al. [16] and Uttra et al. while opposite from Ogbara et al. and

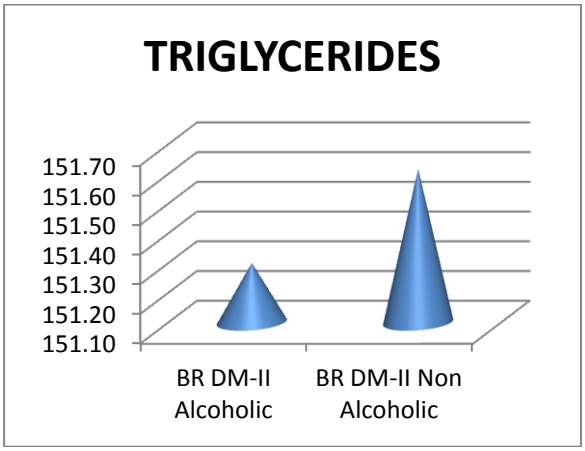


Fig. 3(a).

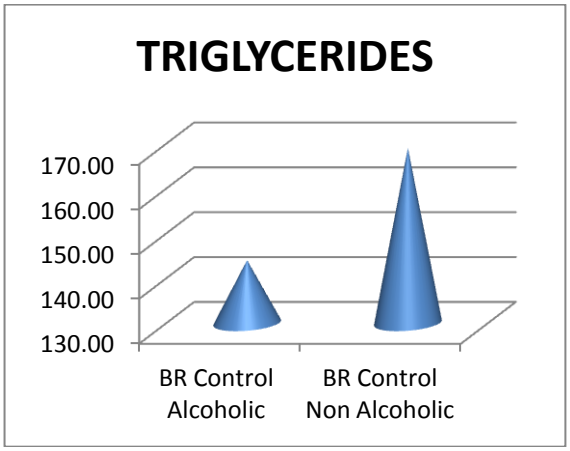
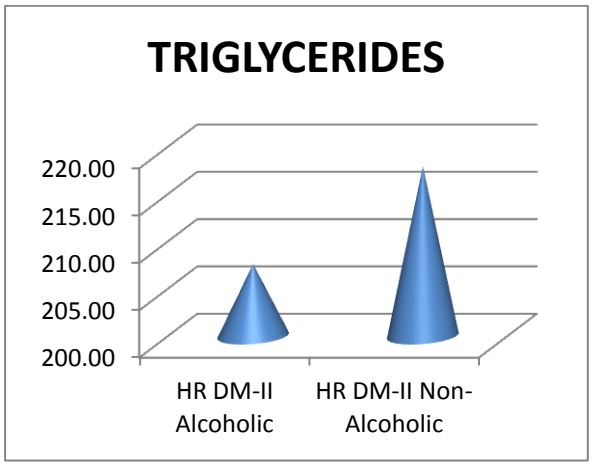


Fig. 3(b).



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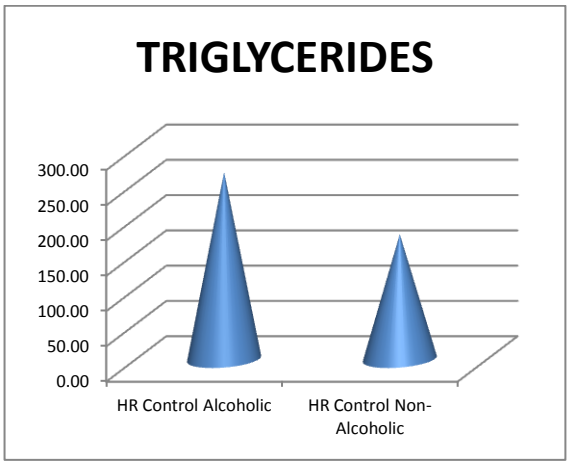

Fig. 4(b).

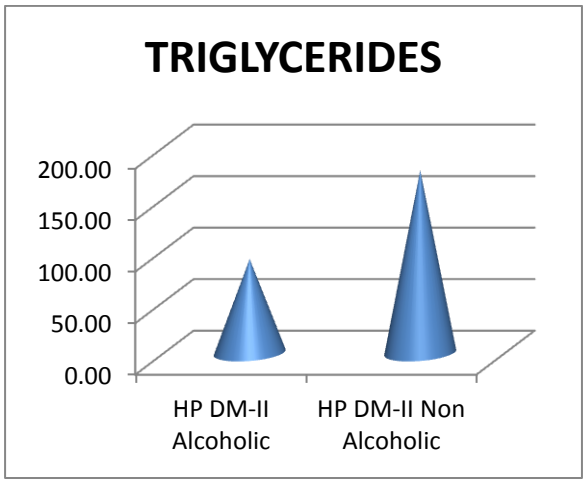

Fig. 5(a).

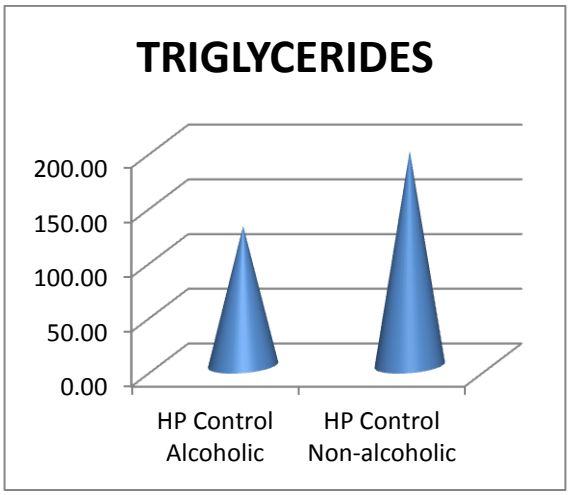

Fig. 5(b).

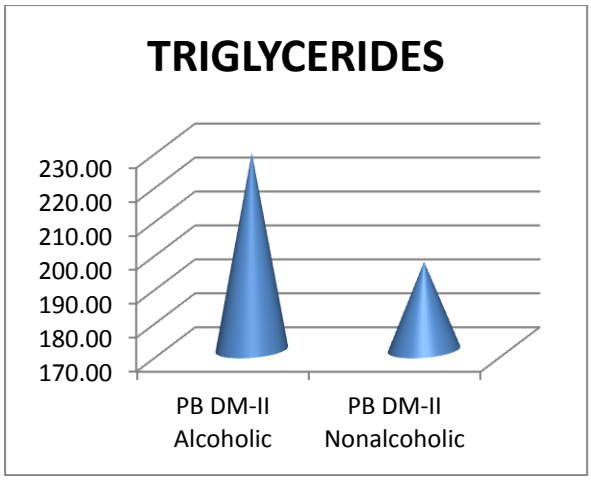

Fig. 6(a).

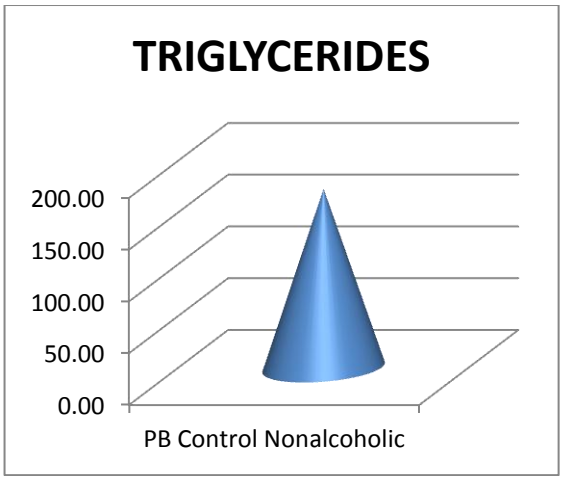

Fig. 6(b).

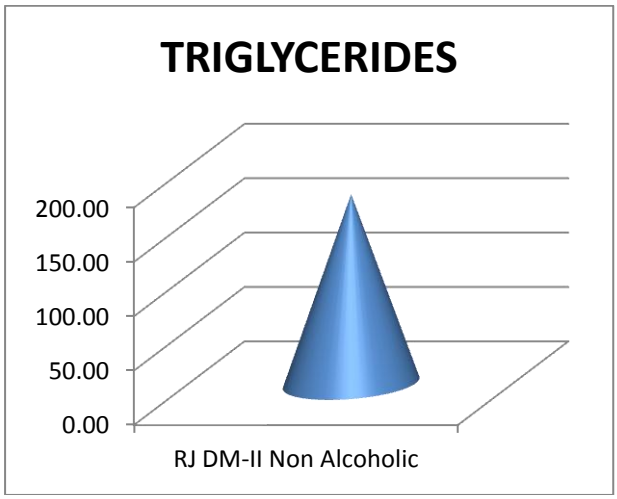

Fig. 7(a).

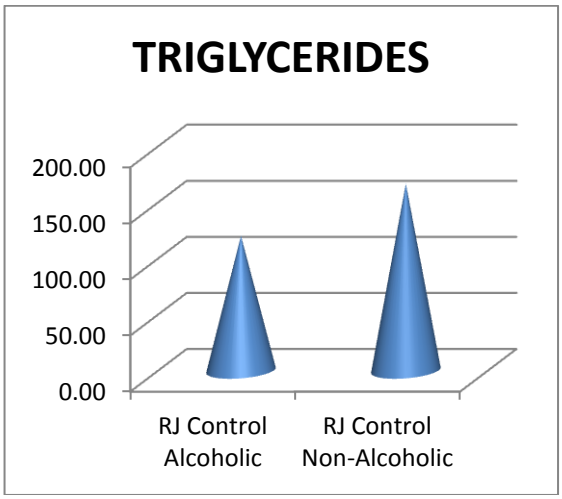

Fig. 7(b).

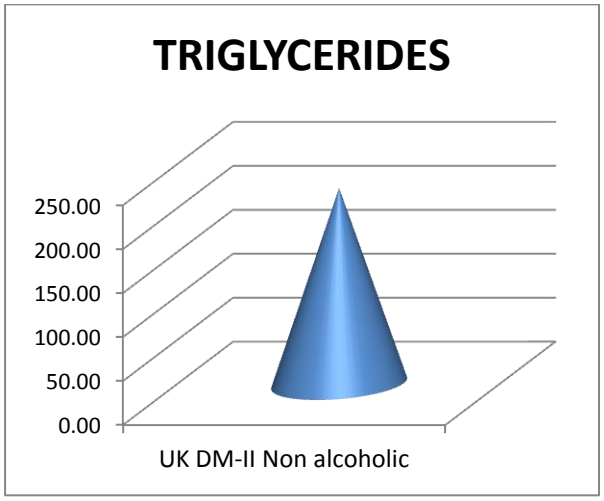

Fig. 8(a).

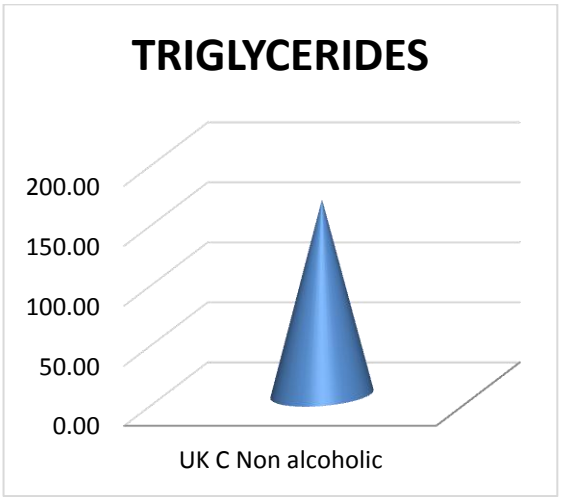

Fig. 8(b).

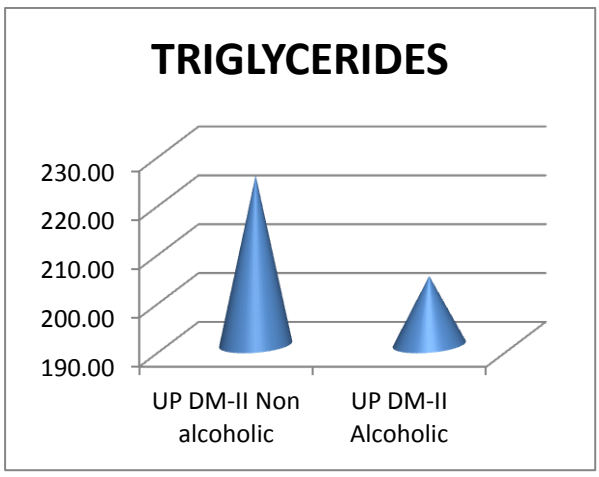

Fig. 9(a).

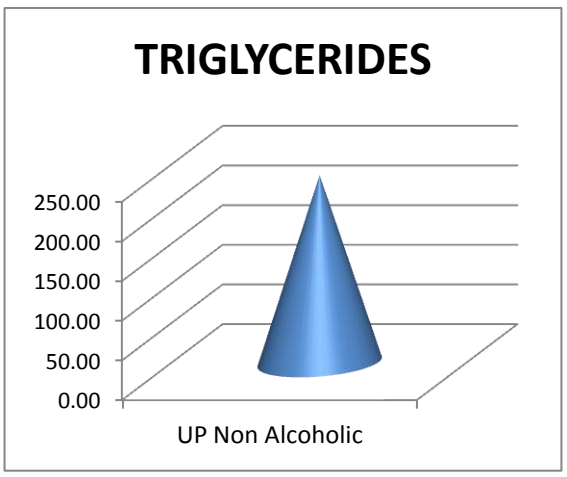

Fig. 9(b).

Fig. 3-9 (a & b). Shows plasma triglycerides level variation among the alcoholic and nonalcoholic groups of DM-II and control subjects from the different states of India

(Bihar, Haryana, Himachal Pradesh, Punjab, Rajsthan, Uttarakhand and Uttar Pradesh)

Oluyomi et al. studies. Plasma Triglycerides level in diabetic females and males of Uttar Pradesh were 241.85±10.70 and 204.25±17.68. Our results were consistent with that of Ogbara et al. in Nigerian population and Oluyomi et al. in Nigerian population while opposite from the result of Mahato et al. [16] studies in Nepali population and Uttra et al. studies in Pakistani population.

4. CONCLUSION

The present study estimates the Triglycerides variations among the blood of alcoholic and non-alcoholic peoples from different states of India. The incidence of diabetes increases globally due to lack of effective prevention and control programs. Plasma Triglycerides level of Rajasthan DM-II female and male subject were171.90± 14.22 and 175.11± 10.71 while Plasma Triglycerides level of Uttarkhand diabetic female and male subjects was found to be 195.15± 45.35 and 240.33± 55.75. T1DM usually accounts for only a minority of the total burden of diabetes in a population; it is the predominant form of the disease in younger age groups in most high-income countries.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

ACKNOWLEDGEMENT

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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