Thyroid Functional Status in Relation to Hyperglycemia, Body Mass Index in Type-2 Diabetes Mellitus

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ABSTRACT:

Type-2 diabetics are more prone to develop thyroid disorders. Both are interlinked with each other. A study was conducted on type-2 diabetics without any complications. It was observed that hyperglycemia is closely related to BMI and free T_3 levels were significantly reduced in type-2 diabetics. Hence every type-2 diabetics have to be evaluated for thyroid function tests before any clinical manifestation.

Key words: *Type-2 diabetes mellitus, Hyperglycemia,thyroid functional status, body mass index.*

INTRODUCTION

Thyroid dysfunctions and Diabetes Mellitus are the two most common endocrine disorders encountered in clinical practice. Both influence each other. Thyroid hormones act as general pacemaker accelerating metabolic processes so diabetic patients are more prone to develop thyroid dysfunctions.

MATERIALS AND METHODS

30 known type-2 diabetics and 20 normal subjects attending SVSMCH Medicine OPD were selected to estimate blood glucose by semiautoanalyzer and thyroid profile by chemiluminiscence immunoassay and BMI was calculated by using the Quetelet's index[1].5ml of blood sample was collected from the patients aseptically by venipuncture.

RESULTS

The result of present study was discussed in 3 groups:

> **Group-A:** Non diabetic with normal BMI.

➢ **Group-B:** Type-2 diabetes mellitus with normal BMI.

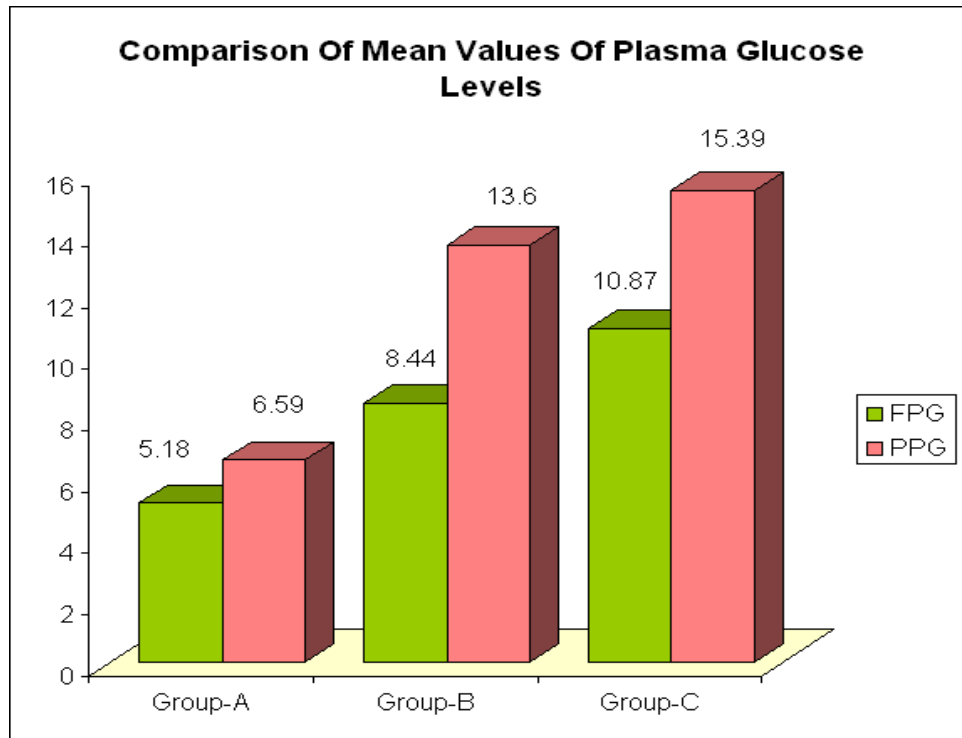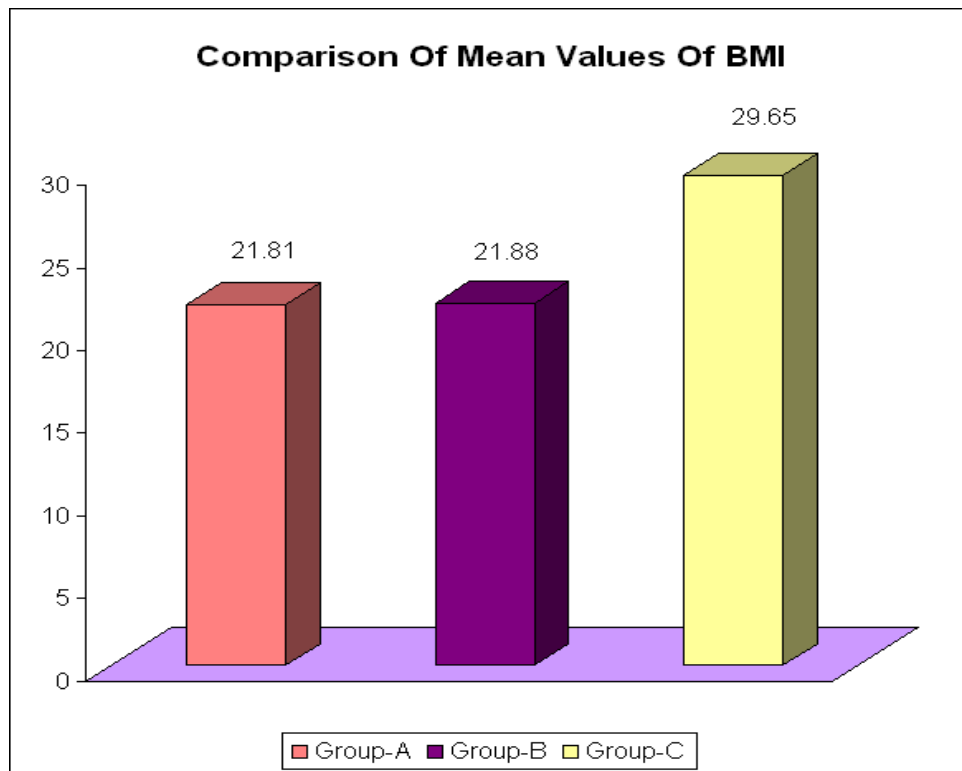➢ **Group-C:** Type-2 diabetes mellitus with high BMI.

Figure 1

Figure - 2

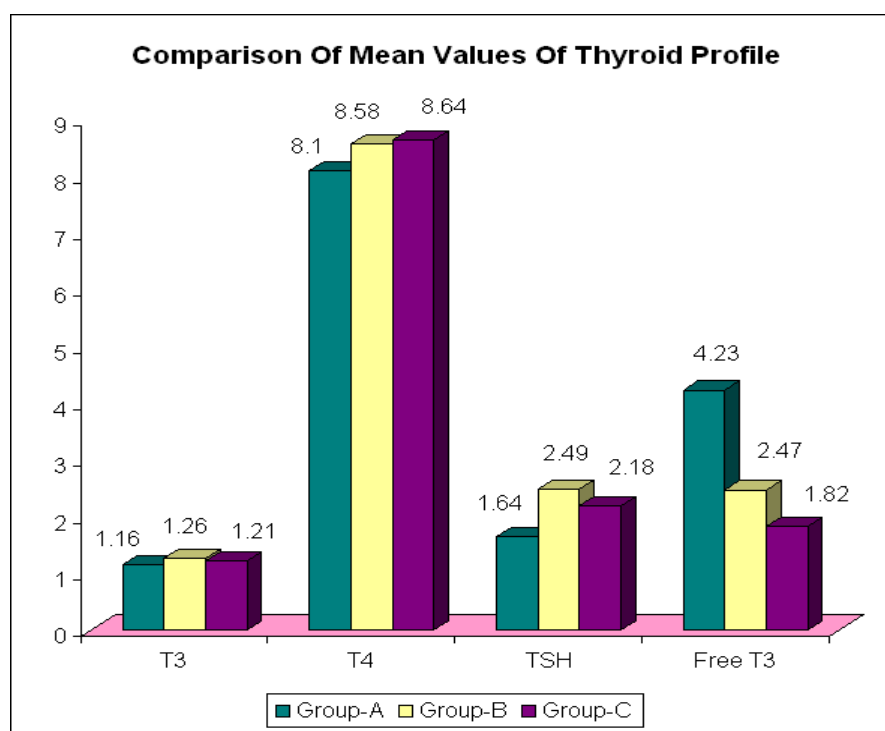**Comparison Of Mean Values Of Thyroid Profile**

Figure 3

Statistical analysis was done by comparing group B, group C, with group A by using student t-test.

DISCUSSIONS

1. The result of the present study shows that the test groups inspite of being on oral hypoglycemics still have high fasting and post prandial hyperglycemia and is more significant in those with high BMI as shown in fig-1.

2. BMI is important underlying factor in pathogenesis of insulin resistance syndrome as shown in fig-2 . Adipocytes releases adipokines in response to metabolic changes. These adipokines play important role in pathogenesis of glucose intolerance abnormalities associated with insulin resistance syndrome. So visceral obesity plays an important role in the pathogenesis of type-2 diabetes mellitus

and body mass index is a critical factor to be evaluated in diabetic patients. In diabetes mellitus patient increase in tumor necrosis factor $-\alpha$ and interleukin-6 levels and decrease in the levels of adiponectin is seen[2,3,4] .

3. In fig-3 it was observed that freeT_3 levels were significantly reduced in type-2 diabetes mellitus which is due to reduced peripheral conversion of T_4 to T_3 via 5' monodeiodination reaction and is in par with the study done by R Sathish, V Mohan in 2003[5]. Thyroid hormone activation to T_3 and inactivation to reverse T_3 is mediated by the specific selenodeiodinases [6,7]. It has been shown

that selenodeiodinase2(D2) is the enzyme responsible for free T_3 in plasma[8].

4. Iodothyronine deiodination may be altered in fasting state and during illness which markedly decrease free T_3 levels and also decrease T_4 clearance.

5. Hence thyroid hormone exhibits dimeric physiological effects in human system and changes in free T_3 levels also contribute to various biochemical changes and manifestations in type-2 diabetes mellitus.

CONCLUSION

It shows that severity of hyperglycemia is closely related to body mass index and significantly decrease in freeT_3 levels in diabetics is due to decrease in selenodeiodinase D_2 activity. So every type-2 diabetics have to be evaluated for thyroid profile prior to any clinical manifestation.

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