HOMEOSTATIC MODEL ASSESSMENT OF INSULIN RESISTANCE IN THE PATIENTS OF HYPOTHYROIDISM

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INTRODUCTION

1. Insulin resistance (IR) is generally regarded as a pathological condition in which cells fail to respond to the normal actions of the hormone insulin [1].

2. Hypothyroidism is a clinical syndrome which is caused due to deficiency of thyroid hormones leading to generalized slowing of metabolic processes [2].

3. Overt hypothyroidism is an established risk factor for insulin resistance [3].

4. Evaluation of insulin resistance is important for understanding the disease status and selection of pharmacological treatment [4].

5. Homeostasis model assessment, first described by Matthews et al., is a method for estimation of insulin resistance [4].This model is based on theory of a feedback loop between β-cells and the liver [5].

AIMS AND OBJECTIVES

1. Serum TSH in all the subjects.

2. The Fasting blood sugar levels in all the subjects.

3. The Serum Insulin levels in all the subjects.

4. To calculate Insulin Resistance by HOMA-IR model.

MATERIALS AND METHODS

Place of Study: Govt. Medical College and Associated Groups of Hospitals, Kota, Rajasthan, India.

Duration of Study: January 2016 to June 2016.

Sample Size:52 subjects (28 were diagnosed cases of hypothyroidism and 24 were the controls) of ages > 25years and ≤50 years.

Sample Analysis: FBS by fully auto analyzer by GOD-POD method, Serum Insulin and Serum TSH levels on Roche Cobas e 411 by chemiluminescence technique.

Calculation of HOMA-IR: By HOMA Model.

CALCULATION OF HOMA-IR:

- HOMA-IR = [FPG (mg/dl) × Fasting Insulin (µU/ml)]/405
- HOMA – IR = FI X G / 22.5

[FI=fasting insulin µIU/ml, and G=fasting glucose (mmol/l)]

EXCLUSION CRITERIA

- Pregnancy
- Patients of type 1 and type 2 DM.
- Chronic renal disorders and liver disorders
- Congestive heart failure
- Glomerulonephritis and pyelonephritis
- Patients on drugs like corticosteroids, lithium carbonate, etc.
- Age < 25 years, > 50 years
- Known cases of hyperthyroidism
- Patients of CNS disorders (Eg. Brain tumors, pituitary tumors, etc)

STATISTICAL ANALYSIS

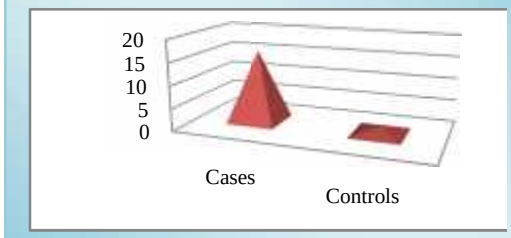
Done by: Using Microsoft Excel Program.

Results: Expressed as Mean ±SD.

P- value: Comparison of results was done by Students' Unpaired t-test between Cases and Controls. P- value was calculated.

RESULTS

The Mean ± SD of Serum TSH in hypothyroid cases was 16.07 ± 2.88 and in controls was 1.77 ± 0.71.

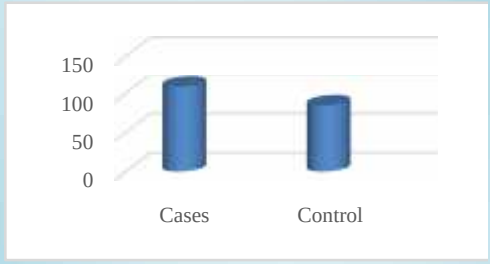


Graph 1: Showing the Mean of TSH of Cases and Controls.

The Mean ± SD of Fasting Insulin in hypothyroid cases was 12.26 ± 2.4 and in controls was 3.4± 0.65.

Graph 2: Showing the Mean of Fasting Insulin of Cases and Controls.

The Mean ± SD of Fasting blood sugar in hypothyroid cases was 108 ± 14.45 and in controls was 84± 8.9.



Graph 3: Showing the Mean of Fasting Blood Sugar of Cases and Controls.

HOMA-IR was calculated by HOMA model. The Mean ± SD of HOMA-IR in hypothyroid cases was 3.27 ± 0.45 and in controlswas0.70 ± 0.12.

Graph 4: Showing the Mean of HOMA-IR of Cases and Controls.

Biochemical Parameters	Cases (n=28)	Control (n=24)	P-value
TSH (mU/L)	16.07 ï 2.88	1.77 ï 0.71	0.0001G
F Insulin (µU/ml)	12.26 ï 2.4	3.4 ± 0.65	0.0001G
FBS(mg/dl)	108ï 14.45	84± 8.9	0.0001G
HOMA-IR	3.27ï0.45	0.70ï0.12	0.0001G

Table 1: Showing the characteristics, the hormonal data, and indices of insulin resistance in cases and controls.
∗P-value was found to 0.0001, which is highly significant.

CONCLUSION

By this study we concluded that IR is increased in hypothyroidism, thus it may lead to development of Diabetes Mellitus.

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