Original Research Article

Study of fasting & PP C- peptide & its correlation with HbA1c in T2 Diabetes mellitus in population of Uttarakhand

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ABSTRACT

Objective: We aimed to provide correlation of Fasting & PP C-peptide with HbA1C in patients of T2 Diabetes Mellitus.

Materials and Methods: 50 patients admitted in IPD of Medicine department in Shri Mahant Indresh Hospital from April-August 2021. Serum samples taken for fasting & PP C-peptide and HbA1C for patients of T2 Diabetes Mellitus and run on VITROS 5600/7600 which is based on dry chemistry.

Results: We took 50 patients who were T2DM then we did fasting C peptide & PP C-peptide and HbA1c. Out of 50, 15 were females &35 were males. Out of 50, 45 patients had raised HbA1C maximum around 8-10.

Mean & SD for fasting C-Peptide for males was 1.346±1.070 & for females 2.442±2.57.

Mean & SD for Post prandiol C-Peptide for males was 4.208±5.020 & for females 2.993±2.130.

It was significant for fasting C- Peptide with P value 0.0371 and non significant for PP C peptide with p value 0.3731.

Conclusion: Insulin secretion estimated by measurement of Fasting C-Peptide was either normal or raised in newly diagnosed T2DM subjects in my study indicating predominant role of insulin resistence in the etiology. Further research can explore the exact contribution of insulin resistence and insulin secretory defects in this area.

1. Introduction

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder characterised by hypoglycaemia, dyslipidemia due to deficiency or inappropriate functioning of Insulin, hypoglycaemic hormone secreted by B cells of pancreas. Its incidence is increasing in the last few years in India with growth rate of 12.5%, the prevalence of Type 2 DM is 2.4% in rural population and 11.6% in urban population.[1]

C-Peptide is a part of proinsulin which is cleaved prior to co-secretion with insulin from pancreatic beta cells. Produced in equimolar amounts to endogeneous insulin, it is not a product of therapeutically administered exogenous insulin and has been widely used as a measure of insulin secretion. C-Peptide is a useful and widely used method of assessing pancreatic beta cell function.[2,3] After cleavage of proinsulin, insulin and (32-amino acid peptide) C-peptide are produced in equal amounts.[4,5] The degradation rate of C-peptide in the body is slower than that of insulin (half-life of C-peptide is 20-30min, compared to that of insulin is 3-5 min). In healthy individuals the plasma concentration of c-peptide in fasting state is 0.3-0.6 n mol/l and postprandiol is 1-3 n mol/l.[5]

Hb undergoes non enzymatic glycosylation in persons with persistent hyperglycemia and designated as HbA1c. HbA1C represents the integrated values of glucose over

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Table 1:

Parameter	Male Mean±SD	Female Mean±SD	T value	P value	Significant
Fasting	1.346±1.070	2.442±2.573	2.144	0.0371	S(P≤0.05)
PP	4.208±5.020	2.993±2.130	0.8991	0.3731	NS(P≥0.05)

Table 2:

Parameter	Male Mean±SD	Female Mean±SD	T value	P value	Significant
Fasting	1.346±1.070	2.442±2.573	2.144	0.0371	S(P≤0.05)
HbA1c	9.631±3.076	10.33±2.206	0.7948	0.4306	NS(P≥0.05)

Table 3:

Parameter	Male Mean±SD	Female Mean±SD	T value	P value	Significant
PP	4.208±5.020	2.993±2.130	0.8991	0.3731	NS(P≥0.05)
HbA1c	9.631±3.076	10.33±2.206	0.7948	0.4306	NS(P≥0.05)

Table 4:

Parameter	Raised Mean±SD	Unraised Mean±SD	T value	P value	Significant
Fasting	3.377±1.795	0.717±0.509	7.8927	0.0001	S(P≤0.05)
HbA1c	10.11±2.701	5.466±0.152	2.9492	0.0049	S(P≤0.05)

preceding 6-8 weeks and provides an additional criterion for assessing glucose control.

2. Aims & Objectives

Our aim was to study correlation of Fasting c-peptide & Postprandiol C-peptide with T2 Diabetes Mellitus in patients coming to SMIH for evaluation and follow up for treatment of Type 2 Diabetes Mellitus.

3. Materials and Methods

50 patients admitted in IPD of Medicine department in Shri Mahant Indresh Hospital from April-August 2021. Serum samples taken for fasting & PP C-peptide and HbA1C for patients of T2 Diabetes Mellitus and run on VITROS 5600/7600 which is based on dry chemistry.

4. Results

We took 50 patients who were T2DM then we did fasting C peptide & PP C-peptide and HbA1c. Out of 50, 15 were females &35 were males. Out of 50, 45 patients had raised HbA1C maximum around 8-10.

Mean & SD for fasting C-Peptide for males was 1.346±1.070 & for females 2.442±2.57.

Mean & SD for Post prandiol C-Peptide for males was 4.208±5.020 & for females 2.993±2.130.

It was significant for fasting C- Peptide with P value 0.0371 and non significant for PP C peptide with p value 0.3731.

5. Discussion

T2DM is one of the leading cause of mortality and morbidity globally. While all ethnic groups are affected, the prevelance of T2DM in South Asians is extremely high and is continuing to rise rapidly. Though the South Asians share the basic pathophysiological defects of T2DM observed in ethnic groups there is strong evidence to suggest that South Asians are more insulin resistant than Caucasians with the onset of diabetes at younger ages with comparatively lower BMI. In Addition to an increased propensity for insulin resistance, South Asians may experience early decline in B cell function compared with other ethnic groups and an early impairment in B cell function cells also be a key pathophysiological mechanism in T2DM development in South Asians.[6] There are different methods to measure B cell secretory function. Acute insulin response (AIR) or AIR max is the gold standard for assessment of B cell function but difficult to perform in clinical setting.[7] Assay of serum insulin as a measure of insulin has half life 3-5 minutes and almost half of insulin secreted to pancreas is degraded by hepatic first pass metabolism. C-Peptide secreted in the equimolar amount of insulin has negligible extraction by the liver and constant peripheral clearance making half life longer than insulin. For this reason it is commonly used in preference to insulin measurement when assessing B cell function in clinical practice.[8]

6. Conclusion

Insulin secretion estimated by measurement of Fasting C-Peptide was either normal or raised in newly diagnosed T2dm subjects in my study indicating predominant role of insulin resistence in the etiology. Further research can explore the exact contribution of insulin resistence and insulin secretory defects in this area.

7. Source of Funding

None.

8. Conflict of Interest

The authors declare no conflict of interest.

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