# Study of serum Vitamin D in Type II diabetes mellitus in Civil Hospital Ahmedabad

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## Abstract

**Introduction:** Type-II diabetes is one of the most common non-communicable chronic disease and Vitamin D deficiency is also considered a public health problem around the world. As Vitamin D deficiency influence the insulin levels so this study is conducted.

**Objectives:** This study aims to evaluate serum level of Vitamin D in patients with type II diabetes mellitus.

**Materials and Methods:** 50 patients with type II diabetes is taken as cases and 50 healthy person taken as control. Study is conducted from june 2017 to sept. 2017 in Civil Hospital, Ahmedabad.

**Result:** In present study mean serum vitamin D level of case is significantly lower than controls. P value is < 0.05

**Conclusion:** It suggests that alterations in vitamin D status may affect insulin sensitivity, β-cell function or both. So monitoring of Fasting plasma sugar & Post prandial plasma sugar levels in patients along with serum Vitamin D plays an important role in prevention & treatment of the Type II Diabetes Mellitus.

**Keywords:** Vitamin D, Diabetes Mellitus.

## Introduction

Type-II diabetes is one of the most common non-communicable chronic disease and its complications play a major role in morbidity and mortality worldwide. Diabetes is fastest growing with the status of a potential epidemic in India with more than 62 million diabetic individuals currently well diagnosed with the disease which is among the top 3 contributing nation followed by China and US. Vitamin D deficiency is also considered a public health problem around the world. Recent studies show that vitamin D deficiency may predispose to glucose intolerance, altered insulin secretion which leads to type -II diabetes mellitus.[1]

## Materials and Methods

This study in Cross-sectional study conducted during june 2017 to September 2017 in Civil Hospital, Ahmedabad. 50 known patient of diabetes taken as cases and 50 apparently healthy individuals taken as controls.

**Table 1: Diagnostic criteria for Diabetes Melitus Type II***

| Test | Threshold |
|---|---|
| HbA1c | >6.5% |
| FBS | >126 mg/dl |
| PPBS | >200 mg/dl |
| RBS | >200 mg/dl |
| * NGSP- National Glycohemoglobin standardization program | |

**Inclusion Criteria:** Comprised of diagnosed cases of Type II Diabetes Mellitus, both genders, aged 40-60 years.

**Exclusion Criteria:** Pediatric age group (<18 yrs), Pregnancy, Renal disorders, Hepatic disorders, Bone disorders, Hypertension or any other systemic illness that may affect plasma sugar & Serum Vitamin D levels, Patients on any medications that might affects plasma sugar & Serum Vitamin D levels.

**Sample Collection:** For serum vitamin D 5.0 ml of blood collected with clot activator plain vaccute and samples are transported to the lab at 2-8°C immediately. Ensured the complete clot formation has taken place before to centrifugation in red/yellow vaccute. Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy, may show increased clotting time. Serum is removed from the clot within 2 hours of drawing the sample. For Plasma Glucose 5.0 ml of blood is collected in fluoride vaccute and transported to the lab at 2-8°C immediately and centrifused. If testing was delayed for more than 24 hours, serum specimens are stored at 2-8°C and analyzed next day as per criteria (Ueland PM 1993).[2]

**Sample Analysis:** All samples are immediately analysed subjected to assays after thawing at 37°C. The measurement of plasma glucose is analysed on an Erba XL 640 Fully Automated Analyzer by kit of crest biosystems, a division of coral clinical systems. The measurement of vitamnin D is analysed on Beckman & coulter 600DXI.Serum Vitamin D level was estimated by Chemiluminescent Microparticle Immunoassay(CMIA) method. Fasting plasmasugar &

Post-prandial plasmasugar levels were estimated by GOD-POD method by colorimetry.

**Data Analysis**

Data was analyzed by unpaired t- test using graphpad prism version 3.03 statistical software which evaluated the differences of various parameters in both group cases and control on the basis of p value. Interpretation was done by p-value

{P < 0.05 - Significant, P < 0.001 - Highly significant, P ≥ 0.05 – Not significant}

## Result

**Table 2:**

| Gender | Cases | Controls |
|---|---|---|
| Male | 26 | 27 |
| Female | 24 | 23 |
| Total | 100 | 50 |

In present study there is equal distribution of gender so there is no bias.

**Table 3:**

| Test | Cases | | Controls | | P value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| FBS | 190.9 | 57 | 89.7 | 8.7 | <0.05 |
| PPBS | 303.5 | 80.8 | 129.2 | 7.6 | <0.05 |
| Vit D | 17.7 | 6.5 | 50.8 | 8.06 | <0.05 |

The table shows that Serum Vitamin D is significantly lower in cases (17.7 ± 6.5 ) ng/ml as compared to controls (50.8 ± 7.8 )ng/ml ; p value <0.05).

## Discussion

In our study we found that vitamin d level is very low in cases as compare to controls which may be explained by this mechanism. Direct action via vitamin D receptor (VDR) activation which are present on β-cell of pancreas. Vitamin D influences β-cell insulin secretion by increasing intracellular calcium concentration via non selective voltage dependent calcium channels. Indirectly via calcemic hormones, β-cell calcium dependent endopeptidases, which produce the cleavage that facilitates the conversion of proinsulin to insulin.[3,4,5]Vitamin D have Immune-modulating properties therefore due to its deficiency Chronic low-grade inflammation of pancreas is observed in obese individuals, which increases the risk of type 2 diabetes.[6]

## Conclusion

Evidence from this study shows there is possible role of vitamin D in the pathogenesis of type 2 diabetes. It suggests that alterations in vitamin D status may affect insulin sensitivity, β-cell function or both. Thus, monitoring of Fasting plasma sugar & Post prandial plasma sugar levels along with Vitamin D plays an important role in prevention & treatment of the Type II Diabetes Mellitus.

**Limitations**

As our sample size is small here so confirmations by further study on large scale are necessary.

## References


1. Mathieu C, Gysemans C, Guilietti A. Vitamin D and diabetes. Diabetologia 2005;48:1247–57.
2. Ueland PM, Refsum H, Stabler SP. Total homocysteine in plasma or serum: methods and clinical applications. Clin Chem 1993;39:1764-79.
3. Inomata S, Kadowaki S, Yamatani T et al. Effect of 1a(OH)-vitamin D3 on insulin secretion in diabetes mellitus. Bone Miner 1986;1:187–92.
4. Ogunkolade BW, Boucher BJ, Prahl JM. Vitamin D receptor (VDR) mRNA and VDR protein levels in relation to vitamin D status, insulin secretory capacity, and VDR genotype in Bangladeshi Asians. Diabetes 2002;51:2294–300.
5. Holick MF. Vitamin D: importance in the prevention of cancers, type 1 diabetes, heart disease, and osteoporosis. Am J Clin Nutr 2004;79:362–71.
6. Zella JB, DeLuca HF. Vitamin D and autoimmune diabetes. J Cell Biochem 2003;88:216–22.
7. Zeitz U, Weber K, Soegiarto DW. Impaired insulin secretory capacity in mice lacking a functional vitamin D receptor. FASEB J 2003;17:509–11.