

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

Anuja Adarsh<sup>1</sup>, Vikas K Vaghela<sup>2\*</sup>, Nayan mali<sup>3</sup>

<sup>1,3</sup>Resident, <sup>2</sup>Senior Resident, <sup>1,2</sup>Dept. of Biochemistry, <sup>3</sup>Dept. of Physiology, <sup>1,3</sup>B. J. Medical College, Ahmedabad, Gujarat, <sup>2</sup>AMC Medical College, Ahmedabad, Gujarat, India

**\*Corresponding Author:**

Email: Drvikaskvaghela@gmail.com

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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,  $\beta$ -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.<sup>1</sup>

## 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 Mellitus 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 affect plasma sugar & Serum Vitamin D levels.

**Sample Collection:** For serum vitamin D 5.0 ml of blood collected with clot activator plain vacuette 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 vacuette. 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 vacuette 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).<sup>2</sup>

**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 vitamin D is analysed on Beckman & coulter 600DXI. Serum Vitamin D level was estimated by Chemiluminescent Microparticle Immunoassay (CMIA) method. Fasting plasma sugar &

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 ( $17.7 \pm 6.5$ ) ng/ml as compared to controls ( $50.8 \pm 7.8$ ) 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  $\beta$ -cell of pancreas. Vitamin D influences  $\beta$ -cell insulin secretion by increasing intracellular calcium concentration via non selective voltage dependent calcium channels. Indirectly via calcemic hormones,  $\beta$ -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.<sup>6</sup>

### 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,  $\beta$ -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

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