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Impact of vitamin D, deficiency and severity of diabetic nephropathy.

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Introduction

In addition to the role it has traditionally played in controlling the metabolism of bone and calcium, new research suggests that vitamin D may also play a role in the cardiovascular, immune, and reproductive systems. This is in addition to the role it has traditionally played in controlling the metabolism of bone and calcium. These data suggest that vitamin D has an effect on the expression of a large number of genes that are not involved in calcium metabolism. The broad presence of vitamin D receptors throughout the human body lends credence to this assertion.

Many major epidemiologic studies that looked at the influence of vitamin D on metabolic and cardiovascular illnesses found a connection between low levels of vitamin D and an increased risk of developing type 2 diabetes mellitus. This association was shown to be statistically significant (T2DM). Studies have shown that low levels of vitamin D may lead to reduced insulin release from pancreatic beta cells as well as lower levels of calcium inside the cells of the body. [Citation needed] [Citation needed] Insulin resistance in the periphery may be caused by a deficiency in vitamin D, which also reduces insulin receptor expression. Insufficient levels of vitamin D have been associated to cardiac hypertrophy and renin activation, both of which raise the risk of atherosclerosis. Vitamin D deficiency has also been connected to an increased risk of atherosclerosis.

Many individuals in India do not consume a enough amount of vitamin D. A vitamin D deficiency may be even more common in patients with type 2 diabetes in India, as indicated by the findings of the 2018 National Health and Nutrition

Examination Survey, which included participants aged 20 and older. This deficiency may be linked to inadequate glycemic control and/or a variety of complications associated with diabetes. In addition, vitamin D deficiency may be linked to inadequate glycemic control.

The research that has been done on the link between a lack of vitamin D and problems with the micro- and macrovascular system in people with type 2 diabetes has shown some promise, but there is not yet enough evidence to make any definitive conclusions at this time. Numerous studies have indicated that having low amounts of vitamin D is connected with an increased risk of diabetic neuropathy, as well as diabetic nephropathy and diabetic retinopathy. On the other hand, data that contradicts this hypothesis reveals that low levels of vitamin D are not associated with diabetic neuropathy or retinopathy. People who have type 2 diabetes who don't receive enough vitamin D have been shown to have lower levels of low-density lipoprotein cholesterol (LDL-C), higher levels of triglycerides, and higher diastolic blood pressure. This is all due to vitamin D deficiency. Insufficient vitamin D has been related to these illnesses by some study while other research has not shown this connection.

This study's objectives were to determine the incidence of vitamin D deficiency among Indian patients diagnosed with type 2 diabetes and to investigate the connection between vitamin D status and glycemic control, as well as macro- and microvascular complications and cardiovascular risk factors. The findings of the inquiry are going to be provided here.

Methodology

One thousand persons with type 2 diabetes who had visited certain hospitals in Indore at some time between March 2018 and March 2020 were included as participants in this descriptive cross-sectional research. The study was conducted in Indore. Patients who had been diagnosed with osteoporosis, patients who had

chronic renal disease stage 5, patients who had liver cirrhosis, and patients who had refractory cancer were excluded from the research. In the end, a total of one thousand patients were taken into consideration for participation in the research. Because this was a retrospective study, it was not necessary for participants to offer their informed permission in order for the research project to be approved by the Institutional Review Boards of the hospitals where it was to be conducted. We were able to obtain information on the patients' ages, genders, whether or not they smoked, how much alcohol they drank, how long they had diabetes, and the kinds of diabetic drugs they took from the patients' medical records. After taking into consideration the subject's height and weight, the body mass index (BMI) was calculated by dividing the subject's weight, which was represented in kilogrammes, by the height, which was expressed in metres squared. This was done so that the BMI could be converted into a percentage. A manual sphygmomanometer was used to obtain two readings of the patient's blood pressure while they were sitting, and the blood pressure of the patient was determined by taking the average of those two measurements. A sample of the patient's venous blood was collected after they had fasted for at least ten hours continuously during the previous night. For the purpose of determining the 25OHD levels, the chemiluminescent immunoassay was used. Following an examination of the patient's medical history, it was established whether or not the individual suffered from diabetic retinopathy, in addition to nephropathy, neuropathy, and cardiovascular and cerebrovascular illnesses (CVDs). The term "diabetic retinopathy" may be defined based on the presence of either a non-proliferative or proliferative type of diabetic retinopathy, in addition to a treatment history that includes laser photocoagulation. Microalbuminuria, defined as UACR between 30 and 299 mg/g, and macroalbuminuria, assessed as UACR above 300 mg/g, were used to characterise diabetic nephropathy. Macroalbuminuria was measured as UACR over 300 mg/g. Patients were judged

to have diabetic neuropathy if they either conducted the current perception threshold test (CPT) using a Neurometer or reported having pain, burning, tingling, or numbness in their feet or hands. Myocardial infarction, unstable angina, and stroke were all kinds of cardiovascular illness.

Results

Participants averaged 50.1 years of age, had a body mass index of 26.3% (SD = 5.2% kg/m2), and were 62.5 % male. Patients had an average HbA1c of 7.1% 1.7%, had been living with diabetes for an average of 15.3% 8.0% of their lifespans, and took insulin in a percentage of 18.2%. 34.6% of patients were diagnosed with retinopathy, 33.7% with nephropathy, 19.8% with neuropathy, and 16.9% with cardiovascular disease.

The average concentration of 25OHD found was between 17.89 and 7.6 ng/mL. In 45 percent of participants, 25OHD levels were between 10 and 20 ng/mL; in 14 percent, they were between 20 and 30 ng/mL; and in 30 persons, the insufficiency was severe.

Based on clinical and metabolic factors, participants were divided into two groups: those with and without vitamin D insufficiency. ConclusionThose with type 2 diabetes and vitamin D deficiency were younger (51.2 years vs.62.6 years, P0.01), had a higher HbA1c (7.2% vs.7.9%, P0.01), and had a lower HDL-C (45.8 mg/dL vs.47.10 mg/dL, P0.01). Although those with vitamin D insufficiency were more likely to take insulin (18.99% vs. 22.1%, P0.01), there was no significant difference in diabetes duration between the two groups. Furthermore, the prevalence of nephropathy was higher in patients with vitamin D insufficiency (37.2.0 vs 25.8.0 %, P 0.01) than in individuals without a vitamin D deficiency. There was no difference between the two groups in terms of any additional issues.

Conclusion

Insufficient levels of vitamin D were shown to be strongly related with an increase in the severity of diabetic nephropathy in those who had type 2 diabetes. Patients diagnosed with type 2 diabetes who had low levels of vitamin D also had elevated levels of triglycerides and decreased levels of HDL-C. More prospective research is required to fully understand how vitamin D affects lipid metabolism and how diabetes develops and progresses.

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