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Review Article

Vitamin D And Its Relationship To Type 2 Diabetes

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ABSTRACT

The aim of the present study was vitamin D and its relationship to type 2 diabetes. This study was conducted on (20) autistic patients and (10) control, aged (25-50) years.
The result showed the low level of vitamin D in the male , with level 34.33+_4.04 µ g/dL , and female with a level of 39.57+_7.82 g/dL. Because type 2 diabetes causes a considerable amount of early death and morbidity, it is a serious public health issue. Obesity and the rise in the condition's prevalence seem to be closely related. Many large observational studies conducted over the past five years have indicated a possible link between vitamin D deficiency and the onset of type 2 diabetes. In addition to having a significant impact on insulin activity, vitamin D may also influence other pathways that could be crucial in the emergence of type 2 diabetes. This article examines the data relating vitamin D deficiency to the aetiology of type 2 diabetes and identifies critical research topics to explore in order to ascertain whether vitamin D supplementation plays a role in preventing type 2 diabetes.

INTRODUCTION

Vitamin D is a fat-soluble vitamin that is essential to bone, individual tooth, and joint health as well as immune system function.This ignored vitamin is accessible in some foods, but the body generates it in a reaction to sun exposure[1]. There are two forms of this vitamin: vitamin D2 and vitamin D3. Vitamin D2 is a synthetic version called ergocalciferol, that has a shorter shelf life, though vitamin D3 (also known as cholecalciferol) is identical as the vitamin D made by the body in reaction to UVB rays. Studies have shown that vitamin D3 peers to be over threefold as potent as vitamin D2, but most goods that have either "good source of vitamin D" or "fortified with vitamin D" on their labels contain the far less effective vitamin D2[2]. Diabetes mellitus is an illness in which the body ceases to make or respond normally to insulin, giving rise to a high blood sugar (glucose) levels. Urination and thirst improve and people can lose weight even if they are not trying to. Diabetes destroys nerves and reduces having. Diabetes

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damages blood arteries, boosting the chance of heart attack, stroke, chronic renal disease, and sight loss. People with diabetes require a nutritious meal that is minimal in carbohydrates that are refined (including sugar), saturated oils, and junk food[3]. Diabetes narrows blood vessels as an effect of harm which inhibits circulation[4]. The pancreas frequently continues to produce insulin in type 2 diabetes, sometimes even at higher-than-normal levels, especially in the early stages of the disease (previously known as non-insulin-dependent diabetes or adult-onset diabetes). Unfortunately, the body becomes resistant to insulin's actions, meaning the body cannot get enough of the hormone to meet its demands. The pancreas' capacity to produce insulin declines as type 2 diabetes worsens.Although it used to be uncommon among kids and teenagers, type 2 diabetes is now more prevalent[5]. A longer-term vitamin D deficiency can lead to obesity, high blood pressure, psoriasis, osteoporosis, chronic fatigue, Alzheimer's disease, cancer, and type 2 diabetes. Short-term symptoms of the vitamin can range from bone pain and muscle weakness to depression and weakened immune system. Spending 15 to 20 minutes a day in the sun can help your body produce more vitamin D, which lowers your risk of diabetes and other major medical disorders. As an alternative, you can consume foods like eggs, almonds, oily fish, powdered milk, and some fortified cereals along with dietary supplements to meet your daily requirement of vitamin D [1].

MATERIALS AND METHODS:

Pyrogen and endotoxin-free blood collection tubes are required. Serum and plasma cannot be collected from specimens exhibiting hemolysis or hyperlipidemia." The samples ought to have a transparent, clear appearance. Centrifugation should be used to eliminate all of the suspension. In order to prevent recurrent freeze-thaw cycles, collected samples that are not promptly recognized should be separated into single-use portions and frozen in a refrigerator between -20 and 80°C.

Measures for the samples

1. Serum: Overnight, refrigerate the collected whole blood at 4°C. Next, centrifuge it at 1000–3000 rpm for 10 minutes. Samples can be stored at -20°C or -80°C for 1-3 months, or the supernatant can be analyzed right away.
2. Take EDTA, heparin, and sodium citrate as anticoagulants in plasma. Stir thoroughly after adding the plasma. Centrifuge mixture at 1000–3000 rpm for 10 minutes. Test the supernatant right away, or store samples at -20°C or -80°C for a period of one to three months.
3. Tissue homogenate: Take tissue slices and rinse them in 0.01 MPBS. Then, add tissue protein extraction reagent in a volume of 5–10 ml, according to 1G, and combine it with ice water. The mixture must be mixed and centrifuged for 10 minutes at 5000–10000 rpm.Take a sample of the supernatant and test it right away, or store it at -20°C or -80°C for three to six months.
4. Centrifugation of cells should be done for 10 minutes at 1000–3000 rpm.Test the supernatant right away, or store samples at -20°C or -80°C for three to six months.
5. Centrifuge urine, ascites, CSF fluid, etc. for 10 minutes at 1000–3000 rpm. Test the supernatant right away, or store samples at -20°C or -80°C for three to six months.

Test preparation

A. Please remove the Elisa Kit from the refrigerator twenty minutes before using it, and wait until it reaches room temperature before testing.
B. Use double-distilled water to dilute the concentrated washing solution (1:25). Return the unused item.

C. Human VD3 standard sample: After lyophilizing the human VD3 standard sample, add 1.0 ml of standard diluent and let it sit for 30 minutes. Once the sample has fully dissolved, give it a little stir, label the tube, and take dilutions as necessary.(Using the concentration values listed below to create a standard curve is advised: 500, 250, 125, 62.5, 31.2, 15.6, 7.8 ng/ml). Note: Ensure that the lyophilized standard is thoroughly combined and dissolved.

D. The standard sample dilution method's legend: Label seven clean tubes with the following: ②,③,⑫,⑤,⑥,⑦, and ⑧, accordingly. Fill each tube with 300µl of the standard sample diluent. Pour 300µl of the diluent from tube ① into tube ② and thoroughly stir. Additionally Pour 300µl of the diluent from tube ② into tube ③, then thoroughly mix. Proceed as before up to tube ⑦. Negative control is the standard sample dilution in tube ⑧.

5. Biotinylated human VD3 antibody liquid:

Use antibody diluent to dilute the concentrated biotinylated antibody (1:100) to create biotinylated antibody liquid, according to the required amount. It is best to prepare thirty minutes in advance. Plus, it's just valid that one day.

6. Enzyme-conjugate liquid:

Dilute the concentrated enzyme-conjugate with enzyme-conjugate diluent (1:100) according to the required amount. It is best to prepare thirty minutes in advance. That day is the only time it can be used.

7. Color Reagent Liquid:

Mix 9:1 Color Reagent A and Color Reagent B 30 minutes in advance to make Color Reagent Liquid.

Statistical analysis

All data of the current study were statistically analysis by use Microsoft excel version 2010 and spss version 22 by use independent t test for p. value (<0.05).

RESULTS

The result showed the low level of vitamin D in the male , with level 34.33+_4.04 µ g/dL , and female with a level of 39.57+_7.82 g/dL.

Parameter	Male	Female	T-Test	P.Value
Cholesterol	337.7+_ 49.8	338.06+_58.8	0.014	0.98
Vit .D	34.33+_4.04	39.57+_7.82	1.07	0,39

DISCUSSION

The result showed the low level of vitamin D in the male , with level 34.33+_4.04 µ g/dL , and female with a level of 39.57+_7.82 g/dL. of diabetics. Research indicates that maintaining a vitamin level between 40 and 80 ng/ml (100 and 200 nmol/L) is recommended, and that exceeding 100 ng/ml (250 nmol/L) may pose a risk. Despite the fact that many people use vitamin D supplements, exceptionally high blood levels of this vitamin are uncommon. In a ten-year research including over 20,000 participants, only 37 had levels higher than 100 ng/ml (250 nmol/L). But as of late, it has been shown that increasing your body's vitamin D levels to between 60 and 80 ng/ml will aid in controlling blood glucose, which is essential for diabetics[6] . Everybody needs different amounts of vitamin D at different times. Getting a 25(OH)D blood test from your general practitioner is the only way to confirm that your vitamin D levels are within normal ranges. Your blood's ideal 25 OH D level should be 60 ng/ml[7]. Neither vitamin D2 nor vitamin D3 therapy has any typical adverse effects. Hypervitaminosis D, an exceedingly rare illness that arises from consuming too much vitamin D, is the cause of

side symptoms associated with vitamin D. Vitamin D toxicity can occasionally be observed in patients who receive excessive dosages of the vitamin[8-12]. The end effect is an accumulation of potentially fatally high calcium levels in the blood, which can cause frequent urination, nausea, vomiting, and constipation.

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