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Association between Lipid Profile and Vitamin D Level

Lamiaa Saoud Abbod[1], Fatima Amer Abd Algabar[2] and Dhea Sadi Ahmed[3]
[1,2,3]Middle Technical University, Baquba Technical Institute, Baquba, IRAQ.

[1]Corresponding Author: lamia.soud@mtu.edu.iq

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ABSTRACT

Cardiovascular danger elements include fatness, high blood pressure, diabetes, and hyperglycemia, and dyslipidemia are all linked to vitamin D insufficiency aside from cardiovascular disease itself. The purpose of this analysis was to look at how children who were not obese related their lipid profiles to their vitamin D levels. The study, which involved 26 Iraqi patients, revealed that the lipid profile was affected by the vitamin D level. Correlation between Vitamin D3 and cholesterol showed asignificant at the 0.05 level (0.960), and between Triglyceride showed (0.857) significant at the 0.05 level.and in the VLDL, LDL, HDL also showed significant at the 0.05 level (-0.915, -0.974, -0.971).

Keywords- vitamin D deficiency, dyslipidemia, VLDL, LDL, HDL.

I. INTRODUCTION

Vitamin D, a secosteroid, is essential for preventing many illnesses, including cardiovascular disorders. More over 80% of the Exposure to sunshine is where metabolic vitamin D is obtained, with food supplementation providing the remaining 80%. Within the medical world, interest in vitamin D has increased, especially in light of the relationship between a multitude of systemic disorders including insufficient vitamin D. According to earlier research, vitamin D deficiency among adults has a prevalence incidence of 30–50%. [1,2]. Additionally, 74% of children who are obese and 32% of pediatric patients overall are said to be vitamin D deficient. [3]. It is well known that childhood experiences can lead to adult illnesses and their contributing causes [12], in view of the expansion of vitamin D insufficiency is in kids and teenagers [13] as well as the increasing incidence of danger factors for cardiovascular infection in children [14,15]. There is, however, little data on How the two are related Cardiometabolic vitamins D and risk factors status in children. [16,17]. A deeper comprehension of the basic processes and the implementation of action-oriented strategies for the primary and preventative treatment of a number of chronic diseases can be achieved by assessing the link among vitamin D and cardiometabolic threat influences in early childhood. A growing emphasis has been placed on lipid screening and treatments as Long-term research has shown that the condition dyslipidemia in childhood frequently lasts into adulthood and is linked to cardiometabolic illnesses. [18,19]. Therefore, detecting dyslipidemia early is essential to slowing how cardiovascular disease develops over time and long-term health maintenance.

1.1 Vitamin D and Serum Lipids

Serum lipid levels, a notable unconstrained risk factor for CVD, may also redound to the connection amidst vitamin D and CVD. Within a longitudinal investigation of 8,018 nonsmokers and 2,087 smokers in Norway, Jorde et al. (109) discovered a link amidst having high vitamin D level and having a healthy blood lipid profile. similarly among non-smokers. In the cross-sectional, longitudinal portion of the study, there was a connection with a rise in vitamin D over time and a drop in TG in the 1,762 non-smokers and 397 smokers. Additionally, Statistically significant correlations between vitamin D level and diabetes, hypertension, and other conditions were found in a study of 476 people, most of whom were 60 years old (25), but not with smoking or dyslipidemia. In the Jorde and Grimnes review (28), just one of the seven publications reporting

LDL found positive relationships, while three showed negative associations., where one is important. Karhapää et al. (10) discovered no correlation between LDL and calcitriol, but established an inverse link between 25OHD and LDL. It is extremely challenging to assess the connection between vitamin D and TG.; Positive and negative correlations have both been noted (28). Two out of three studies in the Jorde (28) study that reported a ratio of TC:LDL and LDL:HDL also found statistically significant unfavorable relationships with vitamin D. Of the four studies that reported a ratio in the review, Jorde (28) reviewed four studies.

1.2 Laboratory Assessment

Blood samples from the antecubital vein were collected after an 8-hour fast the previous night. While chemiluminescent immunoassay was used to detect the levels of 25(OH)D, the levels of TG and HDL-C in fasting plasma lipids were tested utilizing an autoanalyzer (Roche Diagnostics, Cobas 8000 modular analyzer series) Siemens Healthineers, Erlangen, Germany provides the Stellica Solution.

II. RESULT AND DISCUSSIONS

Table 1: gives an overview of the study Features of the participants, which revealed a significant relationship between vitamin D3 and cholesterol at a 0.05 level (0.960).

Table 1- Correlation between Vitamin D3 and cholesterol in patients:

Parameter	**R**
	D3
cholesterol	**0.960***

*** Significant correlation at the 0.05 level.**

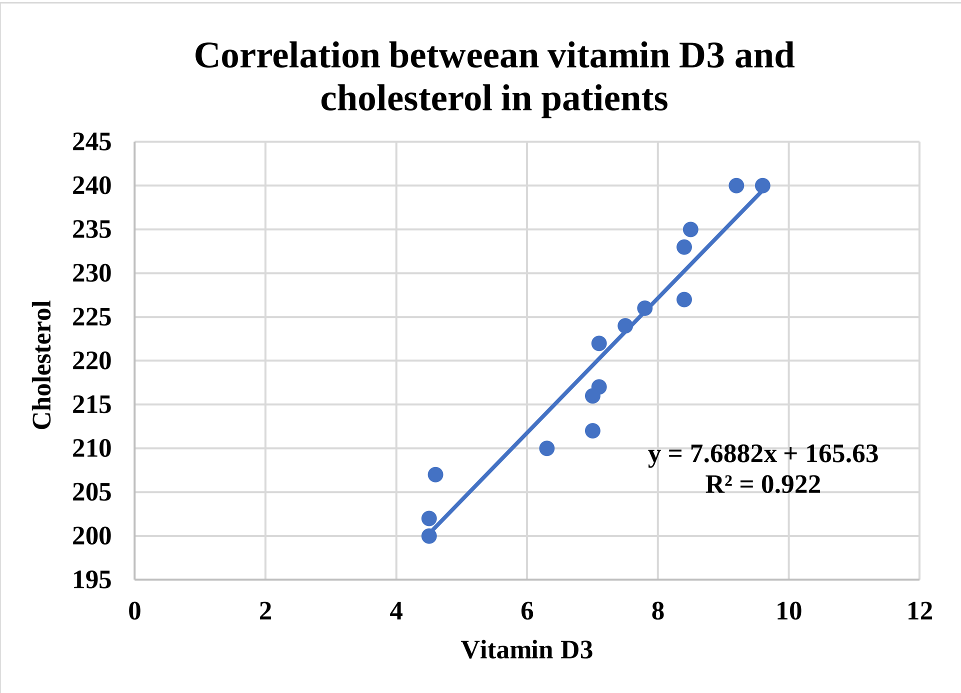

Figure 1-Table 2 showed that was a relationship between vitamin D3 and triglycerides it was (0,857) in 0.05

Table 2: Relationships between Vitamin D3 and triglycerides in patients:

Parameter	**R**
	D3
Triglycerides	**0.857***

*** Significant correlation at the 0.05 level.**

Table 2. demonstrates the connection between vitamin D and triglycerides. Statistical analysis showed a significant relationship at a significant 0.05 level (0.857).

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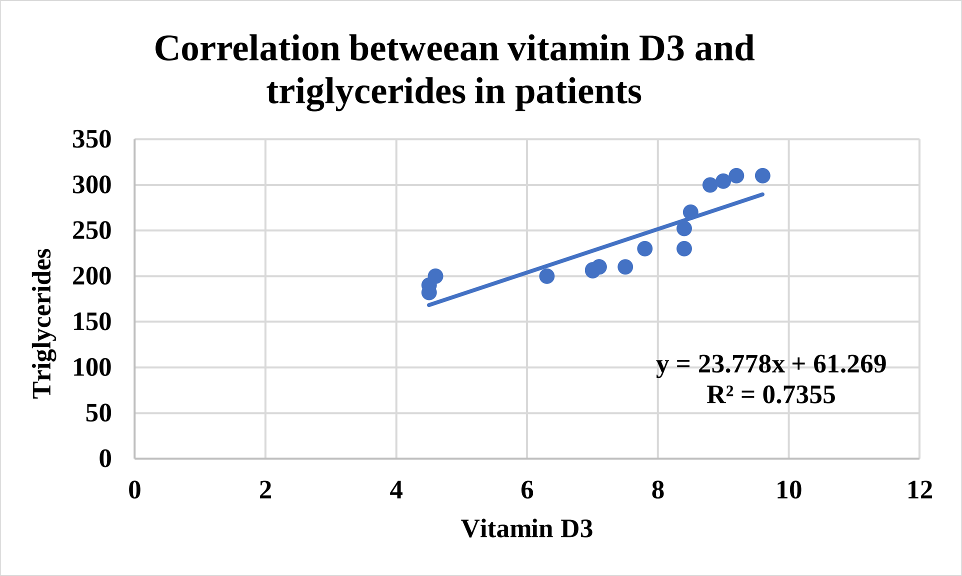

The correlation between Vit D3 and VLDL showed in table 3 , it showed significant at the 0.05 (-0.915)

Table 3- Link between Vitamin D3 and VLDL in patients:

Parameter	**R**
	D3
VLDL	**- 0.915***

*** Correlation is significant at the 0.05 level.**

Table 3. also demonstrates that there is a big distinction between vitamin D and low-density lipoprotein cholesterol (VLDL) at a significant 0.05 level (- 0.915).

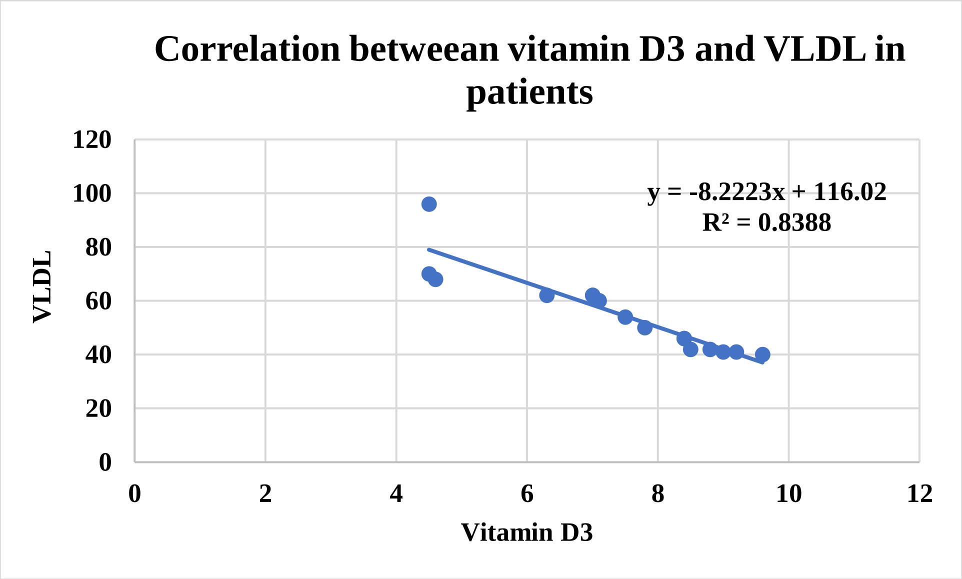

Table 4- Correlation between Vitamin D3 and LDL in patients:

Parameter	**r**
	D3
LDL	**-0.974***

*** At the 0.05 threshold of significance, correlation exists.**

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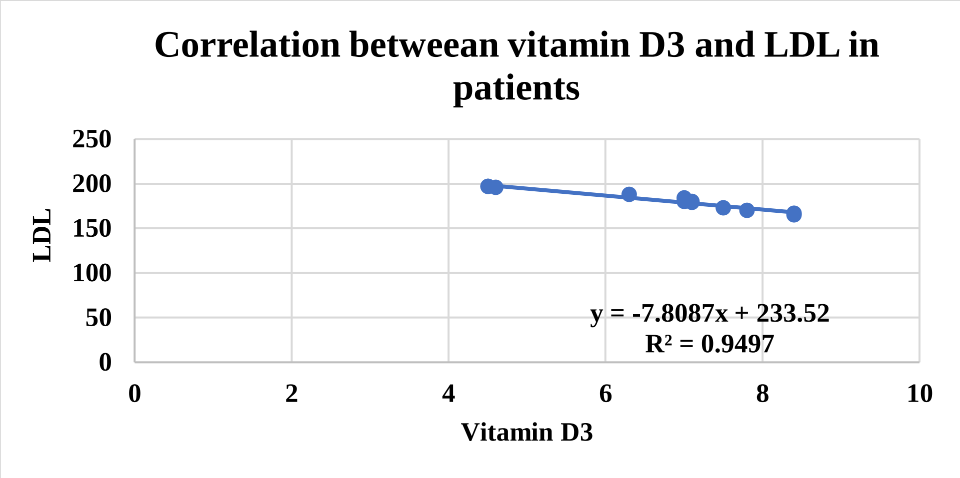
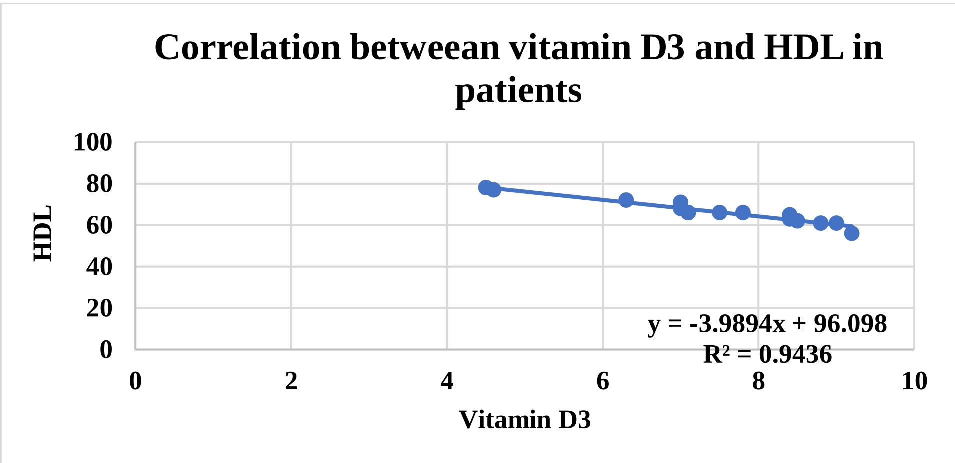


Table 5-Correlation between Vitamin D3 and HDL in patients:

Parameter	r
	D3
HDL	-0.971*

*** Correlation is significant at the 0.05 level.**



The average amounts of vitamin D and HDL were significantly different between the experimental and control groups. as displayed in Table 5 (-0.971*).

Table 6- people with D3 deficiency by gender

%	Frequency	Gender
38	10	**males**
62	16	**females**
100	26	**the total**

Table 6 showed the total of research (26) patients divided in to (10) males (38%) and (16) females (62%)

III. DISCUSSIONS

Based on the outcomes of the study, there is a substantial correlation between serum 25(OH)D levels degree and the fat composition, specifically TG concentration and TG/HDL ratio. LDL and VLDL

Given its long half-life and standing as the best indication of a delicate indicator of blood condition of

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both vitamin D and serum vitamin D levels level, 1,25-dihydroxyvitamin D is still considered to be vitamin D's energetic form, 25(OH)D, the main circulating vitamin D. The HDL, VLDL, and cholesterol in our study. Comparable to the results of the Korea survey known as the National Health and Nutrition Examination Survey in 2008, LDL exhibited high significance when vitamin D3 was added. [24].

a cardiovascular danger signal known as dyslipidemia is characteristic of increased TG and LDL-C amounts and decreased HDL-C values. Small dense LDL (sdLDL) has a tendency to deposit quickly on artery walls, which lowers LDL-C clearance. As a result, atherosclerosis and coronary artery disease are linked to sdLDL. A good indicator of sdLDL level may be the log[TG/HDL-C] is the definition of the atherogenic index of plasma (AIP). AIP > 0.15 was seen as unusual in Wang et alstudy .'s [25]. Consequently, it is possible to forecast future cardiovascular risk using the TG/HDL-C ratio..

Similar findings have been observed by earlier research for the adult population. In their investigation of the consequences of blood consequences of the condition of vitamin D on Chinese people's lipids, Strong association was observed by Wang et al. comparing serum 25(OH)D level and lipids and AIP. Additionally, 25(OH)D insufficiency was unrelated yet connected to dyslipidemia in Indian participants, according to Chaudhuri et al. [26]. Many studies have backed up the association lipid panel and vitamin D level in kids and adolescents. In Lee et alstudy, .'s children who were classified as obese had decreased mean 25(OH)D levels. TG and HDL-C values decreased and rose, respectively, as the vitamin D level rose. [27]. Decreased 25(OH)D levels have been connected to undesirable lipid patterns, according to Rusconi et al. [20].

Lipid levels are connected to the roles that vitamin D plays. First, vitamin D controls intestinal fatty acid absorption via improving the absorption of calcium in the intestine and regulating calcium metabolism. [25]. Consequently, a decrease in the intestinal absorption of fat can lessen the amount of cholesterol. Furthermore, raising the calcium level encourages the liver's production of bile acids from cholesterol, which lowers the blood cholesterol level. [28].

Furthermore, a high amount of vitamin D blocks the parathyroid hormone's action (PTH). When There is not enough vitamin D., Vitamin D might not prevent PTH. [29,30]. A rise in PTH levels promotes calcium influx into adipocytes and increases lipogenesis. Moreover, a high PTH level inhibits lipolytic action, which raises the TG level. Therefore, Low PTH levels can lower TG levels in With relation to elevated levels of vitamin D by promoting peripheral elimination and lipolytic activity. A high PTH level also causes the release of calcium from the bone and accelerates bone turnover. As mentioned above, increasing the calcium concentration can have an impact on the cholesterol level. Third, vitamin D has the potential to influence lipoprotein oxidation and lower TG production as well as liver secretion while enhancing the expression of Particularly low-density lipoprotein (VLDL-C) receptors. As a result, a high dose of vitamin D causes a drop in TG and VLDL-C levels and a rise in HDL-C levels.

Our research demonstrated that vitamin D may have an impact on the lipid profile. Adults with low vitamin D levels had greater TG levels and TG/HDL-C ratios; as a result, they may develop dyslipidemia or obesity. Childhood dyslipidemia lasts into adulthood.(24) According to Lee et al. [31], high TG/HDL-C ratio and hypertriglyceridemia may raise the chance of NAFLD (nonalcoholic fatty liver disease). Low vitamin D levels may therefore be thought to hasten the onset of metabolic illnesses like NAFLD.

The main drawback of our study was that we failed to take into account dietary variations and lifestyle choices that might have altered how vitamin D levels and lipid profiles related to one another. Future research examining the relationship between lipid profile when the state of vitamin D is necessary. Even though it was sufficient to conduct the study, the sample size of this investigation was tiny. Therefore, a sizable cohort research would be required to back up these findings.(30) Little research has been done on the potential therapeutic or preventative effects of dietary vitamin D supplementation. information from epidemiological research [32,33] do not back the hypothesis that 25(OH)D administration might enhance the lipid profile in a positive way, leaving its function unclear. [34]. Verifying if Having insufficient vitamin D result in obesity or consequences like cardiovascular disease will require a long-term follow-up investigation. It is essential to carry out more research on the possible advantages of vitamin D intake for the lipid composition.

Serum Vitamin D and HDL-C concentrations in the current study did not differ statistically significantly, Birken et al., however, in contrast, found no correlation connecting LDL, HDL, and 25(OH)D (35). This research discovered an inverse connection between early childhood 25(OH)D concentrations and circulating lipids, suggesting that early life vitamin D exposure perhaps a changeable risk factor for cardiovascular disease. There is no connection between high blood sugar and the serum 25(OH)D levels.low HDL-C, or hypertriacylglycerolemia was found by Nam et al. in a study of 1504 Korean teenagers in the range of 12 and 18 years (36).

IV. CONCLUSIONS

The results of this investigation somewhat validated the idea that the TG/HDL-C ratio and the TG level are favorably connected with 25(OH)D level. Additionally, our results showed a connection vitamin D concentrations and lipid profiles. Nevertheless, non-obese youngsters typically don't need adult illness prevention or care of cardiovascular disease risk factors. According to the results of our study, it is crucial to keep vitamin D

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levels within a healthy range in order to prevent adult diseases, especially adolescents.

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