RESEARCH ARTICLE

Correlation Between Triglyceride and 25-hydroxyvitamin D in Diabetic Mellitus Patients with Hypertension

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ABSTRACT

The study aims to study the association Triglyceride (TG) with 25-hydroxyvitamin D (VD3) level and HbA1c in Diabetic Mellitus (DM) Patients with and without hypertension (HP). Results show significant differences in HbA1c (P 0.003) and TG (p 0.029) that increased in DM+HP than DM group. VD3 shows that decreased in DM + HP than DM group. Belong to gender, non-significant differences were observed in all study variables in DM group, in DM + HP groups sig differences appeared in HbA1c (p 0.042), and other variables didn't have significant variations, TG was lower VD3 elevated in female than male. The correlation between TG with VD3 and HbA1c shows non-sig weak correlation between TG and HbA1c (r 0.072, p 0.777) in DM, and in DM + HP (r 0.133, p 0.714), TG non-sig inverse with VD3 (r -0.146, p 0.564) in DM and DM + HP (r -0.367, p 0.297). From these finding can be concluded that TG may be affected by VD3 and HbA1C in DM and DM + HP, the present need more investigations to clarify this association.

Keywords: Diabetic Mellitus, Hypertension, Triglyceride, HydroxyVitamin D (VD3).

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INTRODUCTION

The diabetes mellitus disease is a multifactorial disorder characterized by imbalanced glycemic state resulting from impairement in insulin secretion or/and its uptake by cells and long period led to some complications like hypertension.[1] The VD3 has main role in DM disease; its Vitamin D treatment has also enhanced the control of glycemic state and insulin sensitivity in type 1 and 2 of DM.[2-4] The TG level found in high levels in DM patients is associated with cardiac disease[5] and hypertension in adults.[6] There was an association between VD3 and body lipids, in addition to adiposity, metabolic syndrome, and insulin resistances[7-9] (Chiu *et al*., 2004; Ford *et al*., 2005; Hameed *et al*., 2017). On the other hand, it is associated with TG in children[10] (Hirschler *et al*., 2014). There was complex relation between TG, VD3, and DM with and without hypertension; thus, the present study aims to study the same.

METHODOLOGY

A cross-match study was implemented at a private Lab in Najaf province enrolled 29 patients who suffered from DM type 2 diagnosed by biomarkers under specialist physician; samples were collected by written consent from each contributor. The study enrolled (10 patients of DM with hypertension and 19 DM patients), TG, VD3, and HbA1c detected by routine work lab and data were represented as mean ± SE, significant analysis detected by independent t-test at $p < 0.05$. the correlation also estimation among study parameters.

RESULTS

Table 1 explain the baseline characteristics of study groups that consist of 64.28% DM and 35.72% DM with HP, significant differences observed in HbA1c (P 0.003) and TG (P 0.029) that increased in DM+HP than DM group, non-significant of age, BMI and VD3. VD3 shows that decreased in DM + HP than DM group.

Regarding gender in the DM group, there were 33.33% male and 66.66% female, non-significant differences were observed in all study variables, although there were a higher level of VD3 and low levels in TG in females than males. In DM+HP groups, sig differences appeared in HbA1c (P 0.042), and other variables did not make significant variations, TG was lower, and VD3 elevated in females than males (Table 2).

The correlation between TG and VD3 and HbA1c were studied in study groups, the results show a non-sig weak correlation between TG and HbA1c (r 0.072, p 0.777) in DM,

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Table 1: The baseline characteristics of study groups (DM, DM+HP).

Variables	*DM*	*DM+HP*	
Percentage	64.28%	35.72%	-
Age	49.27 ± 12.93	44.30 ± 7.33	0.275
BMI	25.87 ± 4.310	26.09 ± 4.48	0.898
VD3	17.04 ± 9.166	15.75 ± 5.86	0.691
HbA1c	7.37 ± 0.9979	8.96 ± 1.59	0.003*
TG	288.50 ± 81.70	444.50 ± 267.68	0.029*

Table 2: The study variables differences according to gender (male, female).

Variables	*DM* *Male*	*Female*	*sig*	*DM+HP* *male*	*Female*	*Sig*
Percentage	33.33%	66.66%	-	25%	75%	-
Age	47.25 ± 5.691	47.75 ± 5.14	0.954	41.57 ± 2.16	50.66 ± 4.33	0.067
BMI	24.09 ± 3.019	27.43 ± 1.50	0.288	26.12 ± 1.64	26.02 ± 3.36	0.976
VD3	15.35 ± 1.436	19.38 ± 4.78	0.577	15.88 ± 2.09	15.43 ± 4.55	0.919
HbA1c	7.12 ± .317	6.97 ± 0.254	0.732	8.31 ± 0.53	10.46 ± 0.48	0.042*
TG	282.50 ± 47.25	255.12 ± 22.32	0.559	505.28 ± 115.14	302.66 ± 17.37	0.299

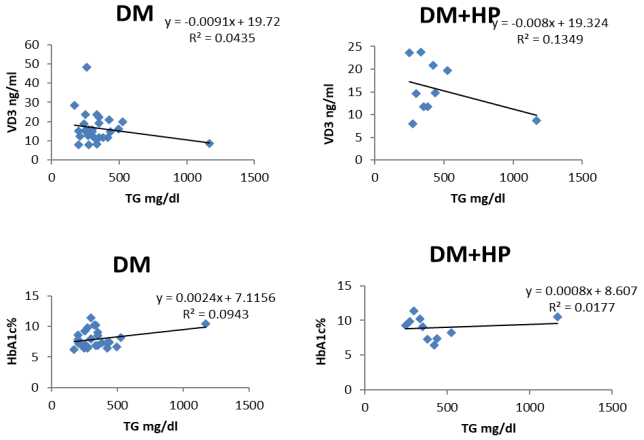

Figure 1: Correlation between TG with VD3 and HbA1c in DM and DM + HP groups.

and in DM+HP (r 0.133, p 0.714), TG non-sig inverse with VD3 (r -0.146, p 0.564) in DM and DM + HP (r -0.367, p 0.297 (Figure 1). The source of Vitamin D3 from diet and synthesized in the skin then it converts to 25OHD in the liver that is used as an indicator of VD3, the deficiency in VD3 level is common in the wild world; it is about 50–80% of the population suffered from insufficiency of VD3 level.[11] The present study show low level of VD3 in DM and DM + HP, which have low than the normal value that ranged 25–80 ng/mL, same results were found by Peng *et al*. and Li *et al*.[12,13] The TG was elevated in DM + HP than DM group, the TG is associated with hypertension.[6] The relation TG with VD3 and HbA1c were studied in both groups non-significant were found in all correlations. Other study didn't deal with the present finding, they found that vitamin D improved serum levels of TG in patients with T2D.[14] The VD3 and TG did not affect by gender in both groups, although it is out of the normal value of VD3 and TG. Both VD3 and TG levels are affected by different factors like lifestyle, nutrition, exercise, genetic presupposition and other environment factors, and the glycemic state in DM.[15-17] It can be concluded that the TG may be affected by VD3 and HbA1C in DM and DM+HP. The present study needs more researches about the role of VD3 and TG in DM complications.

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