Correlation Between Vitamin D3 Deficlency and Hyperglycemla

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ABSTRACT

Diabetes mellitus (DM) is a complex metabolic disease that disrupts the biological environment through a number of deleterious molecular pathways and cellular abnormalities. It is currently a growing global health concern and this study investigated the relationship between vitamin D deficiency and high blood sugar. Blood samples were collected from people in the hospital and analyzed to measure vitamin D levels and fasting blood sugar levels. They found that men had significantly higher vitamin D levels than women. There were no statistically significant differences in fasting blood sugar levels between men and women. Overall, the study suggests that men may be less likely to develop vitamin D deficiency than women, but it did not find a .clear link between vitamin D levels and fasting blood sugar

Keywords: **Vitamin D3** , fasting , blood suger .

1. Introduction and literatures review

The prevalence of diabetes mellitus (DM), particularly type 2 diabetes (T2DM), is rising at an epidemic rate. As of right now, this chronic illness is thought to be the most common metabolic condition globally (Piero et al., 2015). The percentage of US adult population with both diagnosed and undiagnosed cases of diabetes mellitus (DM) is expected to increase from 14% in 2010 to roughly 33% by 2050. Health care systems and individuals with diabetes mellitus have a heavy financial cost (Bommer et al., 2017). DM gives rise to various long-term complications (Forbes and Cooper, 2013). DM and its complications through ,various pathophysiological mechanisms result in significant morbidity and mortality (Forbes and Cooper There is a growing need for better pharmacological agents to prevent and manage DM and its .(2013 .complications (Guthrie and Guthrie, 2004, Yaribeygi et al. , 2019b)

COlecalciferol, also known as vitamin D3 (vitD3), is a member of the class of steroid hormones known as vitamin D and is involved in several cellular and molecular processes, including the appropriate mineralization of bones through the metabolism of calcium and magnesium (Martucci et al., 2017). More and more research is showing a connection between vitamin D and other metabolic diseases like diabetes mellitus and insulin resistance (Park et al., 2016,). In view of this, vitamin D is widely consumed as a dietary supplement worldwide (Poolsup et al. , 2016). There is evidence demonstrating that vitamin D deficiency is more common among patients with diabetes compared to people without diabetes, suggesting that it may be involved in normal glucose homeostasis (Al-Shoumer and Al-Essa, 2015,). However, the exact role of vitamin

D in DM has not been completely elucidated yet (Nakashima et al., 2016). In this current study, we review ,about the possible interactions between the pharmacologic role of vitamin D and normal glucose homeostasis insulin resistance and DM so as the develop new preventive and therapeutic strategies for management of DM

2: Materials 2.1: Laboratory Equipment and Instruments

.Laboratory Instruments used in this study were listed in the table below

Table (2-1): apparatus used in laboratory work

.No	Instruments and tools	Company	Origin
.1	Syringe	SUMBOW	China
.2	Tourniquet	Hightop	China
.3	Alcohol	Almoj	Emirates
.4	Cotton	Alsalama	Iraq
.5	Gel tube	Afco	Jordan
.6	Pippet	Dragonlab	China
.7	Blue tips	wafi	Iraq
.8	Yellow tips	wafi	lraq
.9	Centrifuge	Hettich	Germane
.10	The incubator	JRAD	Germany
.11	Spectrometer	Gallen kamp	Japan
.12	Kit Fasting blood sugar	Labtech	Chin
.13	MAGLUMI	Ysenmed	Germany

Table (2-2): Diagnosis Fasting blood sugar Test

Kit	Company	Origin
GLUCOSE GOD-PAP	BIOLABO SAS	France

2.2: Sample (collected a sample)

Blood samples were collected at Al-Rifai General Hospital and examined for changes in vitamin D among different people. 23 samples from women and 17 from men were collected. There was a difference in .the sample of women being more exposed than men.The purpose of studying assistant

2.3 Estmation of parameters

.glucose (GOD-PAP) Trinder Method 2.3.1

,Glucose is oxidized by GOD to gluconic acid and hydrogen peroxide which in conjunction with POD ,reacts with chloro-4-phenol and PAP to form a red quinoneimine. The absorbance of the colored complex .proportional to the concentration of glucose in the specimen is measured at 500 nm

Manual method

Let stand reagent and specimens at room temperature after 10 minutes at 37 C record

Reagent	**1000ML**
Calibrator, Control or Specimen	10ML

2.4Vitamin D

Kit	Company	Origin
OH Vitamin D-25	Bio medical engineering	China

2.4.1: 25-OH Vitamin D

Use a purified 25-OH Vitamin D antigen to label ABEI, and use 25-OH Vitamin D monoclonal antibody to label FITC. Sample, Calibrator, or Control, Displacing reagent, FITC Label and magnetic microbeads ;coated with anti-FITC are mixed thoroughly and incubated at 37 C. forming antibody-antigen complexes After sediment in a magnetic field, decant the supernatant, then cycle washing for 1 time. Then add ABEI Label, incubation and washing for the 2nd time, sample antigen and ABEI labeled antigen compete to combine with FITC labeled monoclonal antibody, forming antibody-antigen complexes. Subsequently, the starter reagents are added and a flash chemiluminescent reaction is initiated. The light signal is measured by a photomultiplier as RLU within 3 seconds and is proportional to

2.4.2 :Process

We prepare a serum sample. We draw blood from a patient, put it in a gel tube, and use a centrifuge after we finish taking it. 5ml of serum and put in In 2-Tube then we put 25-OH Vitamin D We use a device .MAGLUMI In order to know the level of vitamin D3

MAGLUMI: It is a device used in biochemistry that is sensitive and used in a laboratory to determine the .level of vitamin D3 in a patient's sample

Figure (2-1) A device used to measure vitamin MAGLUMI

Results and discussion

3.1 Sample preparation

Were collected Blood samples at Al-Rifai General Hospital and The work was done in a pathological analysis laboratory outside a hospitalexamined for changes in vitamin D And fasting blood sugar test among different people. 23 samples from women Vitamin D and 23 women's fasting diabetes samplesand 17 from menVitamin D and 17 women's fasting diabetes samples were collected. There was a difference in the sample of women being more exposed than men. The purpose Knowing the relationship between vitamin D3 . deficiency and high blood sugar

Fasting blood sugar test 3.2

blood is drawn from a patient and placed in a gel tube, then placed in a centrifuge, and the serum is separated from the blood. We take a tube and put 10 serum and 1000ML glucose in it, then put it in the incubator for 10ML minutes and I whistle the device. Spectrometers then measure the absorbance of a sample at a wavelength 500nm

Result = Stander/(the sample) x the sample concentration

3.3 Vitamin D test

:**Process**

We prepare a serum sample. We draw blood from a patient, put it in a gel tube, and use a centrifuge after we finish taking it. 5ml of serum and put in In 2-Tube then we put 25-OH Vitamin D We use a device .MAGLUMI In order to know the level of vitamin D3

This table show the concentration of vitamin D and FBS between gender, which there was statistically significant differences (P. <0.05) in Vitamin D which increased in male more than female, but there were no .statistically significant differences (P

.in FBS between male and female (0.05<)

.**Table 3.1**: Comparing Vitamin D and FBS concentration according to gender

	Gender	N	Mean	Std. Deviation	P. value
vit D	Male	8	19.749	2.8191	0.001 >*
	Female	31	12.898	3.1523	
FBS	Male	8	165.63	70.441	0.178*
	Female	31	214.84	94.398	

This table show the concentration of vitamin D and FBS between age groups, which there were no .statistically significant differences (P. >0.05) in vitamin D and FBS between age groups

.**Table 3.2**: Comparing Vitamin D and FBS concentration according to age category

	Age category	N	Mean	Std. Deviation	P. value
vit D	Less than 55	22	13.344	4.1646	0.1*
	More than 55	17	15.545	3.8849	
FBS	Less than 55	22	225.59	98.543	0.106*
	More than 55	17	177.76	75.667	

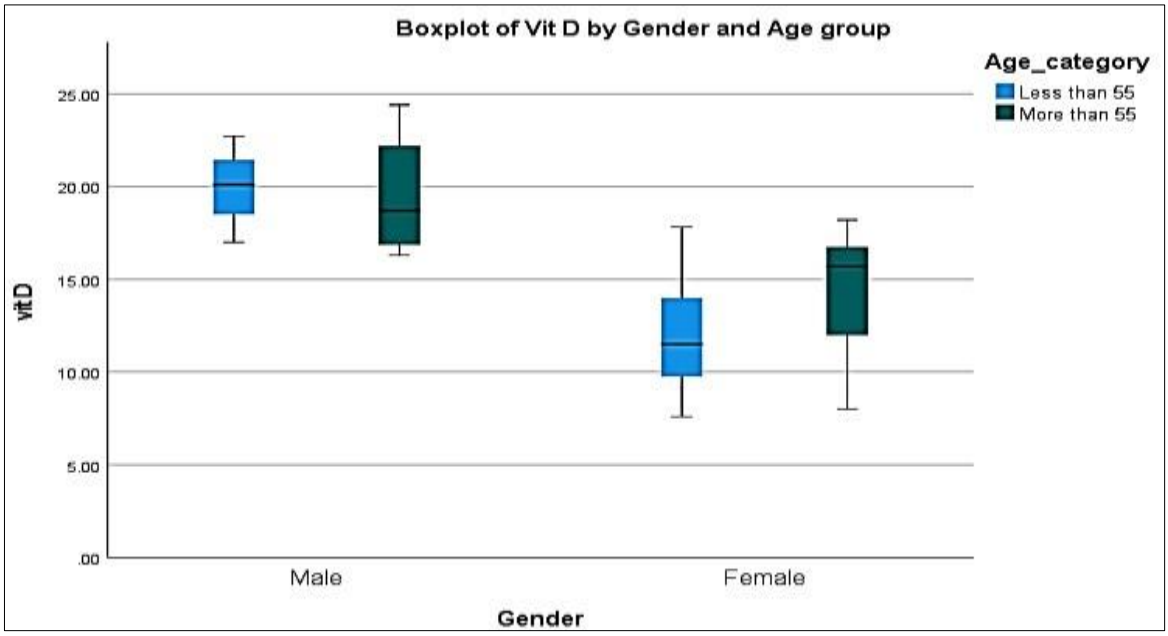
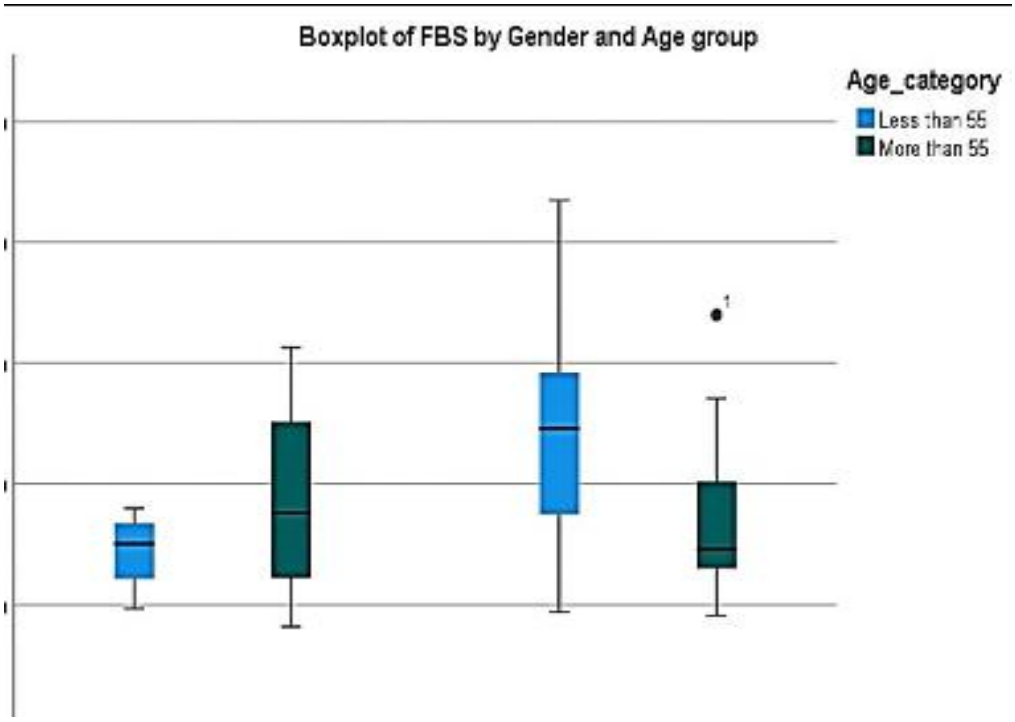
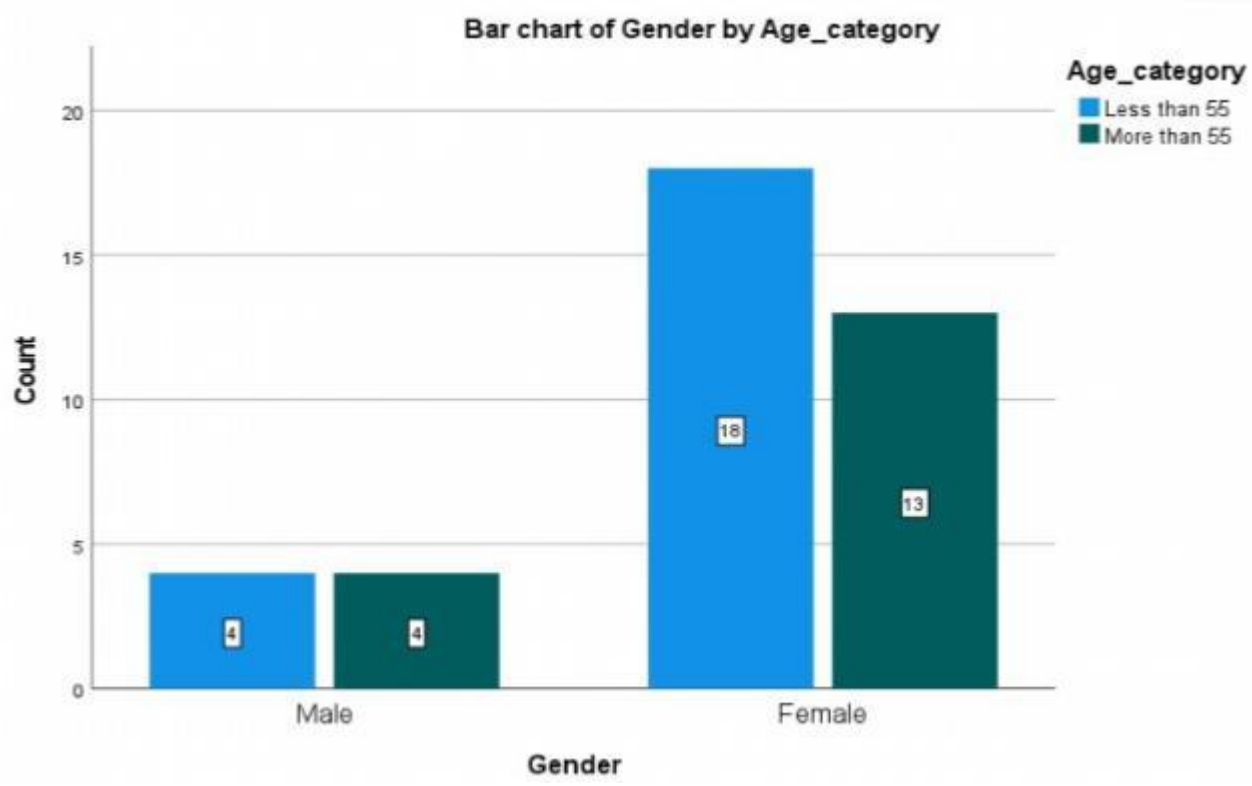


Figure 3.1: Boxplot of Vit D by Gender and Age group, this figure illustrates the different mean .concentration of Vit D according to gender and age

Figure 3.2: Boxplot of FBS by Gender and Age group, this figure illustrates the different mean .concentration of FBS according to gender and age



.Figure 3.3: - Distribution of gender according to age category



4. Conclusions and Recommendations

4.1. Conclusion

:According to the results of the current study, the following remarks can be concluded

1- The prevalence of diabetes mellitus (DM), particularly type 2 diabetes (T2DM), is rising at an epidemic rate. As of right now, this chronic illness is thought to be the most common metabolic condition globally

2- The study found that men had higher levels of vitamin D than women, but there was no significant .difference in fasting blood sugar between genders or age groups

3- In conclusion, the study suggests a possible association between gender and vitamin D levels, but no .link between vitamin D deficiency and high blood sugar was found

4-2 .Recommendations

1- .Conduct a larger study with a more representative sample population

2- We recommend considering other factors that can affect vitamin D levels or fasting blood sugar, such .as diet, exercise, and sun exposure

3- Investigate the mechanisms by which vitamin D may influence blood sugar .levels

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