

Vitamin D Deficiency and It Relation with Weight, Age and Gender in Number of Men and Women in Samarra City

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Abstract: The present study conducted to estimate the prevalence of vit.D3 deficiency and effect of weight and sex on vit. D3 levels. The measured parameters include: vit. D3, weight and this compared between men and women, the results showed there is a significant increase in vit. D3 concentration in women compared with men in age groups (20-29) , (50-59), (60-69) while the age groups (30-39), (40-49) and (+70) had decreased in vit. D3 men compared to women.

There is a significant increase in weight in women for all age groups compared to men except (30-39) and (50-59) groups which showed asignificant increase in weight in men compared to women the results also shows that age has negative effect on vit. D3 concentration in both men and women.

Key words : vit. D3 deficiency, gender, weight

1. Introduction

Vitamin D is one of most important vitamins in body, it soluble in fats (Holick, 1994). Vit D3 produce when 7-dehydro cholesterol exposed to ultraviolet ray that arrive to liver through blood stream then convert to pro hormone calcidiol (inactive form) (Mathieu and Gysemans, 2006), in order to convert vitamin D2 and vit. D3 in to effective compound, needs two steps stimulated by enzymes first step is in the liver where vit D2, vit D3 converted to 25-hydroxy vitamin D by influence of enzyme 25-hydroxylase , second step in the kidneys, α -1 hydroxylase-Enzyme converts 25-hydroxylase vit. D3 to 1.25-hydroxy vitamin D which is called calcitriol and it is the active form of vit. D3, this released to circulatory system by binding to vitamin D binding protein (VDBP) present in the plasma then moving to the various target organs such as the heart , skin and gonads (Mawer et al., 1986; Alkanaani, et al.,2020).

Vit D deficiency relate to several diseases such cardio vascular diseases stress (Holick, 2004), diabetes, cancer haemophilia (Calvo et al., 2005).

The causes of the deficiency can be attributed to limited exposure to sun light, skin colour, cultural habits very hot weather in most countries, obesity (Bandeira et al., 2006; Mustafa & AL-Samarraie,2020)

2. Material and methods

Study samples

The study was conducted on 40 patients attending private medical clinics (20 males and 20 females), aged between (20-80) years to investigate vit D3 deficiency among the samples.

Blood collection

Serum separated by centrifuging at 3000 rpm for 5-10 min and stored deep freeze until being assayed serum

Vitamin D measurement

Serum 250 HD were measured using chemiluminescent immunoassay (Erlangen , Germany)

Statistical analysis

Values expressed as a mean \pm SD, data analysis done by using analysis of variance (ANOVA).

3. Results and discussion

The results in table(1) showed there is a significant increase in the level of vit. D3 in females compared with males for the groups (29-20) , (59-50) and (69-60) , while the age groups (39-30) and (49) 40) and (70+) significantly increase level of vitamin D in males compared to females,

The results also showed in table 1 that there was a significant increase in weight for females compared to males for all age groups except for the categories (39-30) and (59-50) which showed a significant increase in weight in males compared to females, Table 1 also showed that age has a negative effect on vitamin D level in both males and females alike and on the average weight too.

Table: (1): shows comparison of between vit D3 level and weight between males and females and the effect of age on it

Age groups	sex	D ₃	weight
29-20	males	21.21 ⁻ +7.20 b	57.25 ⁻ + 17.34 b
	Females	24.60 ⁻ +6.76 a	72.50 ⁻ + 10.60 a
39-30	males	28.54 ⁻ +9.91 a	76.00 ⁻ + 16.37 a
	Females	22.27 ⁻ +5.53 b	62.00 ⁻ + 4.47 b
49-40	males	16.53 ⁻ + 3.59 a	64.63 ⁻ + 13.29 b
	Females	14.88 ⁻ + 4.69 b	71.33 ⁻ + 10.38 a
50-59	males	14.05 ⁻ + 3.62 b	85.00 ⁻ + 7.07 a
	Females	36.36 ⁻ + 9.17 a	80.00 ⁻ + 10.00 b
60-69	males	18.00 ⁻ + 4.54 b	81.00 ⁻ + 6.55 b
	Females	32.02 ⁻ + 2.14 a	84.50 ⁻ + 7.77 a
+70	males	19.24 ⁻ + 5.15 a	69.55 ⁻ + 15.57 b
	Females	11.05 ⁻ + 2.57 b	77.00 ⁻ + 4.76 a

cross section studies have similar results, which were serum vit. D concentration in obese individuals were significantly lower than in nonobese individuals (Arunabhetal., 2003; Lagunovetal ., 2009; Josefsonetal .,2013: Mustafa et at.,2020) . The mechanism for how obesity effecting on vit. D concentration are dialectical but commonly acceptable noted contain following causes:

Vit. D is lipid soluble and easily restricted via adipose tissue that cause vit. D3 deficiency in obese persons (Wortsman etal.,2000). There is a simpler illustration of volumetric dilution to vit.D3 (Drincicetal .,2012)

Explore the relation of 25(OH)D and body mass index, indicating in 25(OH)D concentration didnot differ in obese individuals after results detected for size this mean a large fat mass might have a reduction action on vit.D level in obese persons , all mechanisms might lead to reduce vit. D concentration in obese individuals and lower availability on 25(OH)D based on above studies fat loss may cause rise vit. D level.

The vitamin D state being decreased in women than men was pointed out in number (Borissova et al., 2013; Yoshimura et al., 2013) but, not all (Yan et al., 2000; Kimlin et al., 2014) of preceding studies. First causes for this gender difference might be influence of adiposity tissue on vit. D concentration.

It known that fat mass percentage is unlike in male and female in average good feed healthy woman has higher fat than man (Frisch., 1994), adiposity tissue would be storage station of vit. D due to vit. D is lipid soluble and adiposity tissue trapped vitamin facilely therefore; causing decreased vit. D in circulation (Rosenstreich et al., 1971; Wortsman et al., 2000).

Instead of that, effects of volumetric dilution can clarify decrease concentrations of vit. D in individuals who have more adiposity tissue (Drincic et al., 2012), other potential explanation might be the hormonal variations and uses of estrogenic contraceptives, and reported that use of estrogenic contraceptives can interpret part of alteration in 25(OH)D levels (Hedlund et al., 2013), Janssen et al., 2013 suggested that estrogen was unfavorable associate with vit. D concentration in postmenopausal women, women's and Men's work environment in middle east is different in terms of mostly spend more time expose to sunlight due to their work but, most of women have inside environment work and this cause that (70%) women have more deficiency of vit. D than men (40%) (Elshafie et al., 2012).

Some studies investigated vit. D3 deficiency base on gender but, without actual comparison between genders that's mean vit. D3 deficiency and risk factors (Elsammak et al., 2010; Oren et al., 2010). The bioactive hormonal form of vit. D is 1,25 (OH)D that bind to vit. D receptor (VDR) together with retinoid and receptor for catalyze specific gene in target organs (Deluca, 2004), vit. D receptor found in many tissues such bones and immune cells and osteoprogenitor cells that consist 1α hydroxylase as a part of an intra and paracrine systems that regulate 1,25(OH)₂D level stable production, 1,25(OH)₂D regulated by parathyroid hormone (PTH) and reduced phosphorus and inhibited via fibroblast growth factor (FGF23) which also regulates phosphorus level, the CYP24 hydroxylase enzyme transforms 25(OH)D to inactive form 24,25 (OH)₂D in the kidneys over the limiting production of 1,25 (OH)₂D, which is necessary for efficient absorption of nutrients, age cause some effect on metabolism of vit. D and calcium such as reduction calcium absorption, resistance of intestine for calcium absorption to circulating 1,25 (OH)₂D, lower VDR, reduction renal production of 1,25 (OH)₂D through aging kidneys, reduced skin output of vit. D and decreased substrate of vitamin D (Gallagher: 2013)

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