

Measuring Vitamin D level in the Human Serum at Basra City (Southern of Iraq)

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Abstract--- *Sunshine vitamin (Vitamin D). It's a fat-soluble prohormone, Vitamin D very importance of bone health in humans (children and adults). It's synthesized in response to sunlight. The aim of study was measure the level of Vitamin D in human body by collecting (100) individuals of patient in different sites of Basra city (southern of Iraq) during period from the 1stSeptember to the 31thDecember, 2019. The patient age range was start from (5 month up to 62 years). Each sample was examined by the technique of (ECL) which is electrochemiluminescence (Cobas e 411 analyzer, Roche Company, Germany). The study shown that there are 83%patients were having abnormal level; while 17%patient was normal or sufficient. 82% of patients had a low level of vitamin D, only 1% of patients had a very high level of vitamin (toxic).There are 63% out of 82% had insufficiency and abider 19% had deficiency. The normal level of Vitamin D must be acquire any number between (30 – 80) ng/mL is and essential to keep a healthy body between (10-30) ng/mL is consider insufficiency, below (10) ng/mL is deficient. The increase of Vitamin D level over (80) ng/mL is poison. The deficiency of Vitamin D level detailed the highest rate (6) cases in age (20 – 29), and age (40-49) years. Both ages in (1 day-9) years and (60-and over) does not having any deficiency, whereas a highest rate (18) cases in age (20-29) years was insufficiency in vitamin D level, one cases in age (60 and over) was the lowest. The high level of Vitamin D is for just one case which was (46) years old.*

Keywords--- *Vitamin D, Insufficiency, Deficiency, Sunlight.*

I. INTRODUCTION

The vitamin D (calciferol) involves a hormone of fat soluble steroid [1]. Naturally; we can get it from a small group of foods, such as (eggs and fish's). The two main physiologically relevant shapes of vitamin D. The vitamin D₂ or 25-hydroxyvitamin D₂(ergocalciferol) and vitamin D₃ or 25-hydroxyvitamin D₃(cholecalciferol)[2]. Vitamin D₂ and endogenously created D₃ are changed in the body to the biologically active shape, 1,25-dihydroxyvitamin D [1,25(OH)₂D] [3]. Vitamin D also named as sunshine vitamin because our skin can synthesis it when exposed to sunlight[4]. When the human body get on vitamin D from dietary sources and by exposure the skin to the sunlight and synthesis or more particularly ultraviolet B (UVB) irradiation. The UVB irradiation is stimulates cutaneous (skin) synthesis of cholecalciferol, in which it is stored in the undergoes hydroxylation or adipose tissue of liver to 25(OH)D, and then after hydroxylation in the human kidney to the active form,1,25-dihydroxyvitamin D[5]. There are a lot of cases that have vitamin D deficiency, it would be about 1 billion, while the people suffer from vitamin D insufficiency about 50% [6]. As said by literature, vitamin D deficiency effect on the bone health[7]. By influence on calcium homeostasis and also cases phosphorus homeostasis [8], various cellular process, muscle disorders and

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cardiovascular disease [9]. Several reports are improving the relationship between the deficiency of vitamin D on cancer and autoimmune diseases[10]. The deficiency of vitamin D at times called vitamin D insufficiency result in muscle weakness, bone loss, secondary hyperparathyroidism, drops and fragility break-in older persons as less severe [11]. Almost 33% of women about (60 to 70) years and 66% of old person about (80) years have osteoporosis [12].Both the deficiency of Vitamin D and insufficiency can happen in several ways[13].There are some factors determined the deficiency of Vitamin D and insufficiency: (a) reduced or restricted to sunlight exposure (b) a reduced cutaneous synthesis of Vitamin D (c) have a mala absorption syndrome and/or obesity [14] (d) in addition to pigmentation and age [15]. For that, some products like milk, juice breads,cheeses and yogurts are prepared with vitamin D in the U.S. country. Multivitamins that include 400 IU vitamin D and supplement having vitamin D alone are now on hand in several amounts containing 400,1000,2000,4000,5000 and 50 000 IU vitamin D3 [16]. Some countries like Norway, Denmark, and Sweden are more than in Mediterranean areas such as Italy and France examination of nutrient eating patterns presented dietary intake of vitamin D [17]. The sufficient levels for vitamin D is between (30-100) ng/mL, For that, the levels less than 10 ng/mL considered deficiency of vitamin D, (10-30) ng/mL deliberated insufficient of vitamin D, While the levels greater than 100 ng/ml considered to be toxic [18].

II. MATERIAL AND METHODS

1. A tube without any anticoagulant.
2. Plan tubes.
3. Sterile alcohol 70%.
4. Cotton.
5. Syringes.
6. Centrifuge.
7. Pastor pipit.
8. Electrochemiluminescence (ECL) technique (Cobas e 411 analyzer, Roche Company, Germany).

Calculation

The analyzer automatically calculates the analytic concentration of each Sample (Either in ng/mL or nmol/L).

Conversion factors:

$$\text{nmol/mL} * 0.04 = \text{ng/mL}$$

$$\text{ng/mL} * 2.50 = \text{nmol/L}$$

Samples collection

A whole blood samples collect from different location of special laboratory from 1st September to 31st December, 2019in Basra city southern of Iraq. in the study use (100) samples from persons and put in a tube without any anticoagulant after centrifuge of blood 3000 round /5minute forget serum use to analyzed by electrochemiluminescence (ECL) technique (Cobas e 411 analyzer, Roche company, Germany),Fig (1).

III. RESULTS

A total of (100) samples were analyzed. Fifty five samples were from women ; while men were fourth five only. All samples examine to measurement of vitamin D levels during period starts from 1st September to 31st December 2019 by using electrochemiluminescence (ECL) technique (Cobase 411 analyzer, Roche company, Germany). The table 1 has shown there are 19 cases that suffering of deficiency in vitamin D, which divided into 12 cases of female and 7 cases of men. Further, the people who have insufficiency were (32) cases in female and (31) cases in men. In addition, only (10) cases of female have sufficiency and men recorded just (7) cases. There is only one sample appeared as a high level of vitamin D (Toxin) for woman at age (46) years old. As the table (2) illustrated that the age located in the range of (20-29) as well as (40-49) years are acquire the highest number of deficiency in vitamin D. Both ages in (1 day-9) years and (60-and over) does not having any deficiency. Furthermore, (3) Cases recorded at age (30-39) years and (50-59) years. Finally, in the age of (10-19) could find one case only. Table 3 appeared the insufficiency in the people. The age (20-29) years recorded the highest frequency which is (18) cases; while the lowest one case at age (60 –and over) years old. Additionally, (14) cases at age (30-39) years, as well as (13) cases at age (10-19) years old. There are (9) cases were found at the age (40-49) years; while the age at (50-59) years recorded (5) cases only. Finley, recorded (3) cases at age (1 day-9) years old.

IV. DISCUSSION

Vitamin D is control for a different variety of functions in the human body[19], because vitamin D take part in an essential role in many acute and chronic diseases [20, 21]. From that, the calculating levels of vitamin D stop of diseases very important and the greatest method for a human's vitamin D statuses to determent a 25(OH)D concentration[22] in this study we used the serum level to determination of vitamin D in the body [23, 24].The deficiency of vitamin D should be defined as 25-hydroxyvitamin D of ≤ 20 ng/mL (≤ 50 nmol/L) and the insufficiency is known as 21-29 ng/mL [25].The present study record (19 %) persons with deficiency of vitamin D (12%) from women and (7%) from men ; while the insufficiency were (63%) persons, (32%) were from women and the men record (31%) as rate. Similarly, what record in the US National Kidney Foundation that levels < 30 ng/mL considered insufficient or deficient [26].The researchers recommended the sufficient level to be ≥ 30 ng/mL (≥ 75 nmol/L) [25,27,28,29] is preferred. The current study recorded the sufficient rate were (17%) persons (10%) from women and just (7%) person were men. Vitamin D is resulting from exposure to sun light[30]. Too much sunlight exposure leads the danger of skin cancer, but not cause vitamin D toxicity[31]. Vitamin D intoxication is uncommon but could be produced by unintended or intended eating of too high dose extra than 150 ng/mL coupled with Hypocalcaemia and hyperphosphatemia [32-33, 34, 35, 36]. There is just one case has intoxication of vitamin D in this study for woman with age 46 years old. Vitamin D deficiency could be linked to persons (especially in Middle Eastern countries) who have more skin melanin content and who use as routine skin coverage. as in our study the deficiency of vitamin D record high rate in age (20-29) years and (40-49) years about (6) cases ; (3) cases at age (30-39) years and (50-59) years. just one case at age (10-19) years, no cases record at age (1 day-9) years and at age (60-and over). The (WHO) World Health Organization has identified a vitamin D deficiency that the serum 25OHD is less than 20 ng / ml (50 nmol / L) [37].

However, some people have newly started to describe vitamin D deficiency as 25OHD levels in serum less than 20 ng / ml and vitamin D deficiency less than 30 ng / ml (75 nmol / L)[38].As in the current study defined the vitamin D insufficiency less than 30 ng/ml so record highest rate (18) cases at age (20-29) years ; while the lowest (1) of age (60-and over). (14) cases in age (30-39) years, (13) cases in age (10-19) years. Also the present study record (9) cases in age (40-49) years, only (5) cases in age (50-59) years finally just (3) cases in age (1 day-9) years.

Table 1: Illuminate the results of vitamin D examination.

Sex	Deficiency Less than 10 ng/ml	Insufficiency (10-30)ng/ml	Sufficiency (30-80)ng/ml	Passions Over than 80 ng/ml	Total
Female	12	32	10	1	55
Male	7	31	7	Ø	45
Total	19	63	17	1	100

Table 2: Prevalence of the deficiency of vitamin D according to age categories

s	Age categories	No. of female	No. of male	Total
1	1 day-9 year	Ø	Ø	Ø
2	10-19 year	Ø	1	1
3	20-29 year	5	1	6
4	30-39 year	2	1	3
5	40-49 year	3	3	6
6	50-59 year	2	1	3
7	60- and over	Ø	Ø	Ø
8	Total	12	7	19

Table 3: Prevalence of the insufficiency of vitamin D according to age categories

s	Age categories	No. of female	No. of male	Total
1	1 day-9 year	1	2	3
2	10-19 year	7	6	13
3	20-29 year	7	11	18
4	30-39 year	7	7	14
5	40-49 year	6	3	9
6	50-59 year	3	2	5
7	60- and over	1	Ø	1
8	Total	32	31	63



Figure 1: Electrochemiluminescence (ECL) technique (Cobas e 411 analyzer, Roche Company, Germany).

V. RECOMMENDATIONS

The traditional clothes and less sports exercises in the fresh air determination from vitamin D results in the body. For that, the study mention to:

1. Daily exposure to sunlight about twenty minutes.
2. Recommend higher levels of vitamin D, to get from sea food, such as salmon, sardines, and perch.
3. Work Sports excesses in the fresh air especially in the morning.

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