Prevalence of Vitamin D Deficiency among Iraqi People

Raheem Sabar Jebur[1], Dr. Ali Hussein mohammed Ali ALkhafaji[1], Ooroba Jameel Taresh[1], Muna Sabbar Jebar[2]

[1]*Ph.D. Clinical biochemistry, URUK University, college of dentistry, Iraq. Email: raheemsabar18@ gmail.com*
[2]*M.B.ch.B, Ph.D. Pathologist, URUK University, college of dentistry, Iraq*
[3]*Ph.D.Radition Physics , URUK University , college of dentistry, Iraq*
[4]*Department of Medical Analysis, Babylon Technical Institute, Al-Furat Al-Awsat Technical University, Babylon, Iraq.*

KEYWORDS
Vitamin D, 25(OH)D level, Baghdad

ABSTRACT
Objectives: Vitamin D deficiency is one of common health problems and it is found in all ethnicities and all age groups, even in countries that have sun exposure all seasons of the year. Materials and Methods: 600 healthy persons aged 3–65 years were participating in this study. All subjects were lived in Baghdad, Iraq. The subjects were divided into four groups according to age and gender. First group adult male 18-65 year contains 200 participate, second group adult female 18-65 year contains 200 participate, third group children male 3-18 year contains 100 participate and fourth group children female 3-18 year contains 100 participate. venous blood samples were used to measured 25-hydroxy (25(OH) D) levels with cobas techniques method. Results: The results showed that the vitamin D deficiency (serum 25OHD level < 20 ng/ml) is prevalence in 77% of the adult male and the mean value is 12.4 ng/ ml, and the ratio of deficiency is higher in female and reach to 87% of adult women and the mean value is 7.4 ng/ ml. Whereas the vitamin D deficiency in children is lower than adult and the results showed that the 23% of male children have deficiency with mean value 20.7 ng/ml also the female children have deficiency in 22% of them with mean value 20.4 mg/ml. The results showed there is significant differences between men and women in mean value of the serum 25OHD (12.4 vs 7.4 P> 0.01), while there are non-significant differences between children male and children female (20.7 vs 20.4 P> 0.01). Also the results showed there are significant difference between children male and adult male (20.7 vs 12.4 P> 0.01) and there are significant differences between children female and adult female (20.4 vs7.4 P>0.01) Conclusion: the deficiency of vitamin D in Baghdad, Iraq is very high in adult male and female and there is a need general education, health policies for investigation and treatment this problem.

1. Introduction

One of common health problems is vitamin D deficiency and there is a study showed that the people who have vitamin D deficiency in worldwide are approximately 1 billion [1]. The studies showed that the problem is prevalence in both developed and developing countries, and this deficiency reach to 30-80% in children and adults [1,2,3] the low vitamin D levels is found in all ethnicities and all age groups [4], even in countries which have sun exposure all seasons of year, the problem is greater in the Middle East, especially in women [5]. The rate of vitamin D deficiency reach to 40% in Europe and 37% in Canada and 24% in America [6,7,8,9]. The people who are suffering vitamin D deficiency, showed greater illness severity, morbidity, and mortality [10]. Recently, many studies have showed relation between vitamin D deficiency and several diseases such as type 1 diabetes mellitus, systemic lupus erythematosus, cardiovascular disease, multiple sclerosis and several types of cancer [11,12,13,14,15]. The report showed that low vitamin D levels associated with an elevate in inflammatory cytokines are also associated with an increase in thrombotic episodes, which are happened in COVID-19 [16]. There are studies reported that no significant relation between decrease in the incidence of cancer in association with vitamin D level, but there is a significant reducing in the rate of death in patients with cancer [17,18]. These reports led to emphasis on treatment of vitamin D deficiency. The essential source of vitamin D 80–90% of the body stores, is via sun exposure which lead to ultraviolet irradiation of the molecule 7-dehydrocholesterol in the skin [19]. The Institute of Medicine (IOM) in USA concluded that level of D3 <30 nmol/l, refer to risk of deficiency and D3 >50 nmol/l indicated sufficiency also they conclude that the level excess of 125 nmol/l may be associated with harm [20], but the US Endocrine Society has another opinion they recommended the level of vitamin D must be (70 nmol/l) for people health and when the individuals <50 nmol/l must be considered as vitamin D deficient [21]. Vitamin D measurement has increased recently and the relevance of vitamin D deficiency is still under debate. 25(OH)D is the most useful test and express about Vitamin D level in the body because the measurement revealed the available and circulating Vitamin D [22].

The aim of this study to evaluate the vitamin D deficiency status in Baghdad city in Iraq.

2. Subjects, Material and Methods

Study population

600 healthy persons aged 3–65 years were participating in this study. All subjects were lived in Baghdad, Iraq. The subjects were divided into four groups according to age and gender. First group adult male 18-65 year contains 200 participate, second group adult female 18-65 year contains 200 participate, third group children male 3-18 year contains 100 participate and fourth group children female 3-18 year contains 100 participate.

Collection of blood sample

One venous blood sample (5 mL) was obtained from each subject at 8.00- 8. 30 am after an 8-12-hour overnight fast. The sample were collected between march and June 2022.

Vitamin D level test

Serum 25(OH)D level is considered the best marker for measurement of vitamin D [23,24]. A range of below 30 ng/ml of serum 25(OH)D level is considered vitamin D deficiency by most authors [21,25], 25-hydroxy vitamin D (25(OH) D) levels were measured with cobas techniques method (Hitachi e411, Japan) All tests were performed in Endocrinology and Diabetes Center, Al-Rusafa, Baghdad.

Statistical analysis

Statistical analysis was done by using commercially available software of SPSS program in type of frequency of each group of population, ANOVA analysis also done for sex and age groups of tested population.

3. Results and Discusssion

600 serum samples were test for the serum 25OHD level to determine the prevalence of vitamin D deficiency among the people who live in Baghdad, Iraq. The results showed that the vitamin D deficiency (serum 25OHD level < 20 ng/ml) is prevalence in 77% of the adult male and the mean value is 12.4 ng/ ml, and the ratio of deficiency is higher in female and reach to 87% of adult women and the mean value is 7.4 ng/ ml. Whereas the vitamin D deficiency in children is lower than adult and the results showed that the 23% of male children have deficiency with mean value 20.7 ng/ml also the female children have deficiency in 22% of them with mean value 20.4 mg/ml (figure 1,2).

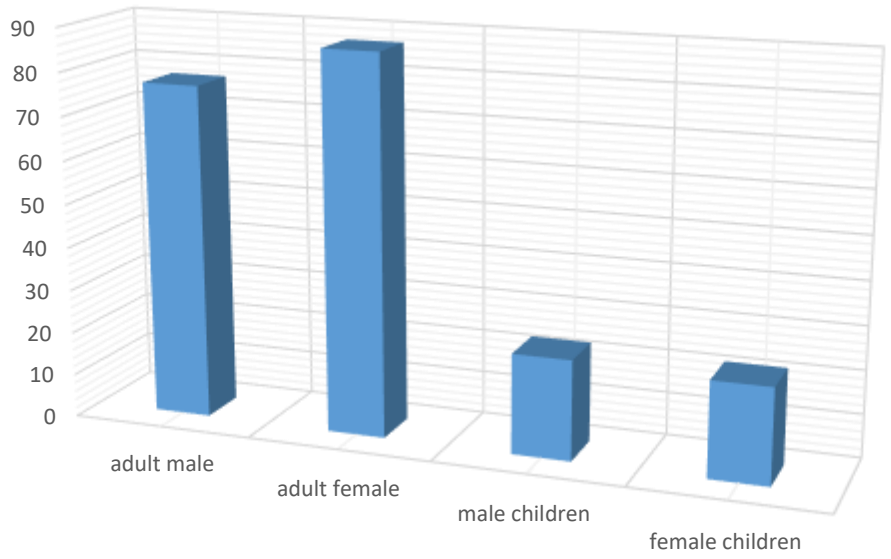


Table (1) The percentage of vitamin D deficiency in different group

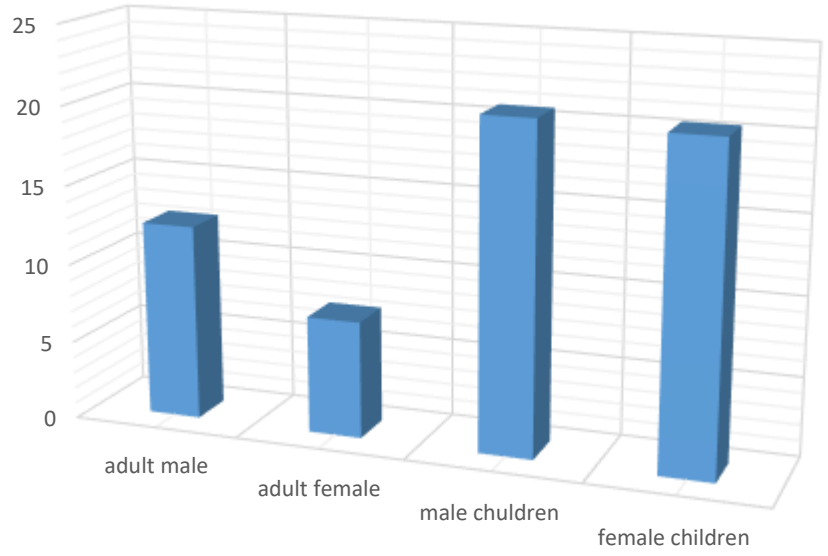
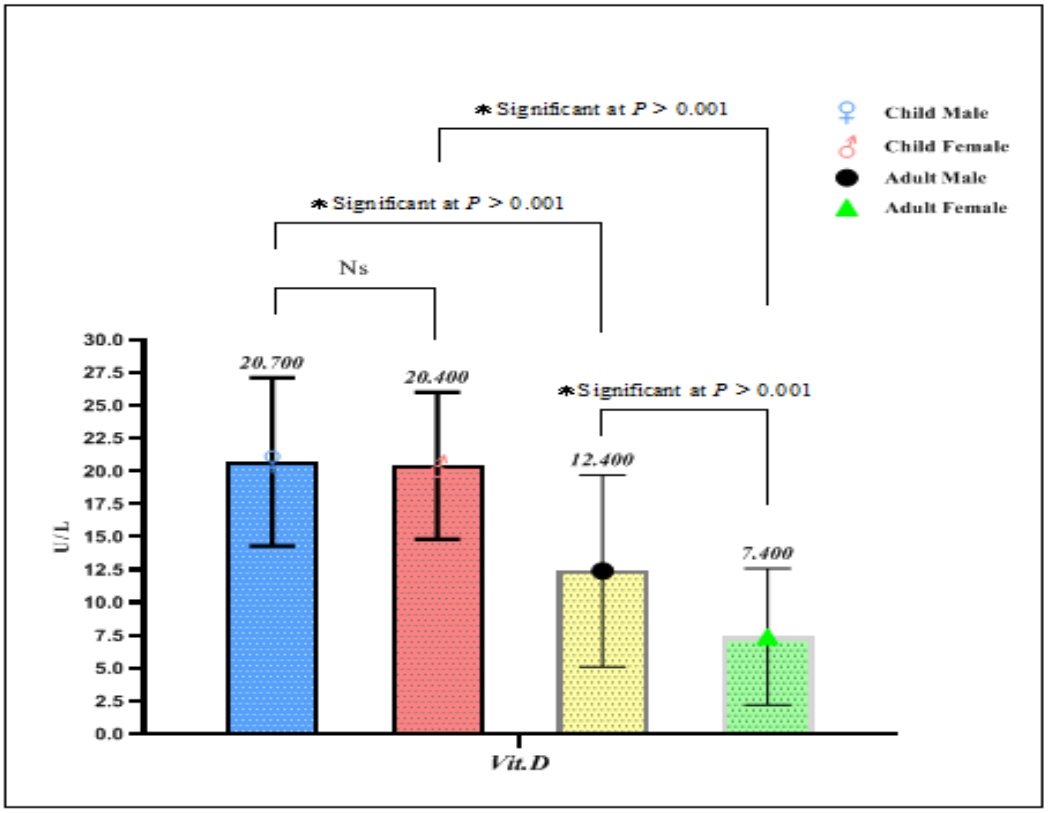


Table (2) mean value of serum 25OHD level ng/ml

The results showed that there are significant differences between men and women in mean value of the serum 25OHD (12.4 vs 7.4 P> 0.01), while there are non-significant differences between children male

and children female (20.7 vs 20.4 P> 0.01). Also the results showed that there are significant differences between children male and adult male (20.7 vs 12.4 P> 0.01) and there are significant differences between children female and adult female (20.4 vs7.4 P>0.01) (figure 3).



The result of our study also showed the percentage of vitamin D deficiency increase with age it is 23% and 22% for children male and children female respectively whereas it is 77% and 87% for adult men and adult female respectively (figure 3).

The prevalence of deficiency of vitamin D level is a global problem in all ages and the problem is greater in the Middle East, particularly in women [5]. Vitamin D deficiency has been associated with many health problem, involve all mortality reasons [26]. There is a study for Gaksch et al., analyzing 17,000 individuals, the results showed high association between low vitamin D levels and increased danger of mortality [27]. So that we try to evaluate the vitamin deficiency in Baghdad, Iraq. The results revealed high level of vitamin D deficiency among Iraqi adults reach to 77% and 87% for men and women respectively that is high ratio when compared with neighboring countries, in a study on healthy young men living in Saudi Arabia showed the prevalence of vitamin D deficiency is reach to 37%. [28], another study curried out in Tehran, Iran showed high prevalence of vitamin D deficiency reach to 57.6% [29]. Also there is study revealed a high level of vitamin D deficiency in China and the vitamin D deficiency reached to 45.2% [30].

The results showed that the vitamin D deficiency is significantly higher in women than men that is may be because the clothing habits in Iraq or little time spent outdoor. One studies showed that vitamin D deficiency is common among women who wear clothes that cover most parts of the body [31, 32]. Our results showed that the deficiency of vitamin D level in children male and children female were 20.7% and 20.4% respectively this results are lower than Turkish children because Nesibe A. et al. have study on Turkish children and adolescents they tested a total of 440 children and adolescents, Overall, 40% of participate had 25(OH)D levels lower than 20 ng/ml [33] that means the vitamin D deficiency in Iraqi children is lower than Turkish children may be that is because duration of exposure to sunlight, there is sufficient sunlight in all seasons in Iraq and the children spend time outdoor more than adult. The result of our study also showed the percentage of vitamin deficiency increase with age 20.7% and

20.4% in children male and female vs 77% and 87% for adult male and female, also Nesibe A. et al 2012 reported similar results in their study on Turkish population [33] Also There is a study in Israel showed that the vitamin D deficiency were lower in the children under 5 years compared to older age groups [4]. Another study in USA report applied on large demographic analyses showed same results [34]. The results showed there is no significant differences between children girls and boys (20.7% vs 20.4%), also Catherine M. et al. in study in USA also reported there was no significant difference in deficiency of vitamin D between adolescent girls and boys (26.0% vs 20.6%) [35]. The deficiency of vitamin D is one of the old problems, Since the1930s, public health officials in USA and UK have used fortification of foods to reduce vitamin D deficiency [36]. Synthesis of vitamin D depends on exposure to UV light and there are many factors effect on it such as latitude, solar light angle, air pollution and skin pigmentation [1].

3. Conclusion and future scope

The medical recommendations to avoid sun expo sure for avoiding the risk of skin cancer may be lead to a global vitamin D deficiency, in addition to that overstates in the use of sunscreen may be reduce levels of vitamin D. There are other hypotheses to explain vitamin D deficiency among Asians. Awumey et a.l suggest other hypotheses about vitamin D deficiency, they have research revealed higher activity of 24-hydroxylase in fibroblasts of Indian-Americans when compared with other control groups [37]. So that, the increased vitamin D catabolism may be a cause of vitamin D deficiency in Asians. When planning for strategies to manage the deficiency problem should contain general education, health policies for investigation and prevention by food reinforcing and used vitamin D supplementation [38]. To keep optimal vitamin D level, use of vitamin D supplementation is required, because sunlight exposure and food alone is insufficient in most people [39,40,41]. A daily vitamin D supplement of 800 IU appears to be enough to achieve a 25(OH)D level of 20 ng/mL in most people [42].

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