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SERUM VITAMIN-D ANALYSIS: A CROSS SECTIONAL SURVEY AT LUMHS

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Abstract:

Vitamin D is very important in children for teeth and bones development, its deficiency results in rickets while in adults it may present as osteomalacia, osteoporosis and arthritis causing joint pain. Supplementations (Oral or injectable) are required if serum levels fall below normal (30-50 ng/ml). Observational study conducted at LUMHS Jamshoro from November 2016 to November 2017. We evaluated 800 patients following selection through Probability sampling under inclusion and exclusion criteria analyzing the obtained data on SPSS version 22 using Student's t-test.

There were 429(53.63%) male and 313(46.37%) females Vitamin –D. Mean of the serum vitamin –D levels was15.61±9.64 ng/ml in men while it was 17.02+12.57ng/ml in women. 69.5% of the study population was found deficiency <20ng/ml while 15.5% were having insufficient levels<30ng/ml and only 15% showed normal levels 30-50ng/ml. There was a significant difference between the two genders with p value 0.082

Conclusion: *Vitamin –D was found deficient in the study subjects with non-significant gender difference statistically.*

Key words: *Vitamin-D, Osteoporosis, Arthritis, Rickets*

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INTRODUCTION:

The synthesis of Vitamin-D takes place in human body on exposure of skin to sunlight [1]. Two reactions involving hydroxylation of vitamin D are responsible to convert it into active form 1,25-dihydroxyvitamin D3 (Calcitriol) with 15 hour half-life [2]. 25(OH)D gets transformed into 1,25-dihydroxyvitamin D by 1α-hydroxylase (renal or extrarenal) having more affinity for vitamin D receptors[3]. It is a derivative of cholesterol endogenously as 7-Dehydrocholesterol then cholecalciferol under sun light exposure in the skin while other sources of vitamin D include eggs, liver, milk and fish [4]. Its daily requirement is 10mcg (400IU)for age range 0-12 months, 15mcg(600IU) in1-70years age group including pregnant and lactating women while it is 20mcg(800IU) above the age of 70 years[5]. This vitamin helps the body to maintain plasma calcium concentration in balance through absorption and reduced renal excretion as well as it is the treat for osteomalacia, Rickets, hypoparathyroidism and renal osteodystrophy [6]. The deficiency of vitamin is associated with many diseases like asthma 92%, 85% and 80% in Pakistan, India and Iran is found associated with vitamin deficiency [7]. Vitamin $-D_3$ insufficiency is described as a serum levels from 20-29ng/ml while bellow 20ng/ml is termed as deficiency [7,8].Vitamin D is found in 5 analogs naturally (vitamers) Vitamin D1, Vitamin D2 (ergocalciferol), Vitamin D3 (cholecalciferol), Vitamin D4 (22-dihydroergocalciferol), Vitamin D5 (sitocalciferol) while multiple synthetic analogs, chemically these are secosteroids, Maxacalcitol (22-oxacalcitriol) being first to be discovered, Calcipotriol, Dihydrotachysterol it is activated by liver bye passing renal hydroxylation it is superior than the naturally occuring vita-D2 and vita-D3, Paricalcitol, Tacalcitol (19-norD2), Doxercalciferol (1α(OH)D2) and Falecalcitriol (1,25(OH) 2-26, 27-F6-D3 [9,10]. This study was planned to investigate serum vitamin D levels in various medical conditions to draw an opinion regarding the trend of prescribing vitamin D in medical practice.

METHODOLOGY:

Serum vitamin D3 levels were measured through Architec Abbot I 2000 in Liaquat University of Medical and Health Sciences, Research and diagnostic lab, Hyderabad. Both male and female genders patients were selected and included from various departments with no age limits. The only exclusion was patients currently on vitamin D_3 treatment. Standard protocols of aseptic measures for collection of blood samples were assured. The data of results regarding serum vitamin D concentration was analyzed on SPSS version 22 for mean and SD, frequency and percentage while t-test was used to compare male and female genders. Statistical level of significance was considered at P- 0.05 and CI-95%.

RESULTS:

Total 800 subjects were taken with 53.63% (429) male and 46.37% (313) female genders. Mean vitamin-D levels in the study population was found 16.32$\pm$11.11 with 2.6 the minimum and 49.3 the maximum. The mean in males was found 15.61 $\pm$9.64and and in females was 17.02$\pm$12.57. Vitamin D_3 was found to be normal (30-50ng/ml) in 12.75% (102) patients only while its deficiency (<20ng/ml) was observed in 63.88% (511) of patients and it was insufficient (<30ng/ml) in 16.12% (129) patients however 7.25% (58) patients showed above the required normal levels (>50ng/dl). There was no significant statistical difference between males and females (P -0.084)

Table I. Showing difference in mean vitamin- D_3 concentration between males and females at CI: 95%

Groups	Serum Vitamin-D_3	t-score	P-Value
Male 429(53.63%)	15.61$\pm$9.64 (ng/ml)	-1.73	0.084
Female 313(46.37%)	17.02$\pm$12.57 (ng/ml)		

Table II. Showing categorization of study subject according to mean serum vitamin D_3 levels

S. No.	Parameter	Frequency	Percentage
1.	Normal 30-50ng/ml	102	12.75%
2.	Insufficient <30ng/ml and >20ng/ml	129	16.12
3.	Deficient <20ng/ml	511	63.88%
4.	High >50ng/ml	58	7.25%
5.	Total	800	100%

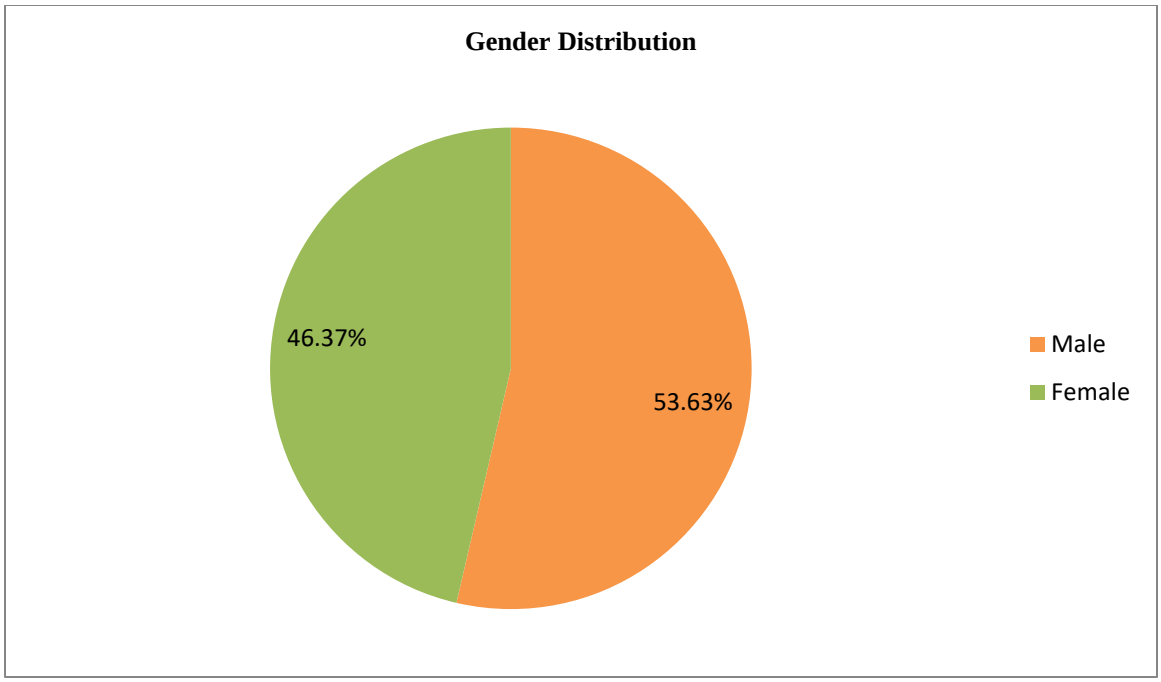

Figure. 1 Pie chart showing gender distribution of study subjects

DISCUSSION:

We found 80% of the study subjects having their vitamin D level below the normally required and 7.25% were having vitamin D concentration above the normal levels while 12.75% patients had normal level that is consistent with the results by Ghazal A et al (2015) reporting vitamin D deficiency in 83.9% of her study population the difference between the two studies was that her results were based on children while our study subjects were children as well as adults [11]. Our findings are also consistent to another study results from Pakistan by Ashique Ali Arain et al (2018) which describes 78.33% of the study subjects having vitamin D3 below the normal level with no significant difference between male and female components p-0.59, however they found 12% of the population with normal levels of this fat soluble vitamin [12]. Wegdan Bani-issa et al (2017) also mention 74% subjects of his UAE based study suffering from vitamin D deficiency and insufficiency (Below the normal range) he reported non-significant difference between the two genders (p-0.16) again in agreement with our research results however his sample size was 260 that was much lower than our 800 subjects study sample size[13]. F.F Zhang et al (2016) in his Kuwaiti study showed 83% of population below normal vitamin D that is parallel to our results [14]. Few patients (7.25%) were having above normal (>50ng/dl) vitamin-D concentration probably due to excessive intake over time but none of them had toxic levels. The Vitamin D deficiency as well as insufficiency requires 4000 units/day or 50000 units/weak for many wks with the aim of raising the concentration >30ng/ml to normalizes the calcium imbalance [15]. AGS (American Geriatrics Society) recommends Vitamin D 1000IU/day along with calcium to elderly above the age of 65years for the prevention of the fractures. This deficiency of vitamin D is an important issue so public campaigns regarding the awareness should be arranged by government authorities especially through television, other media and at all community levels.

CONCLUSION:

The deficiency of vitamin D is very highly prevalent in both genders with no significant difference in between.

REFERENCES:

1. Moan J, Porojnicu AC, Dahlback A, Setlow RB. Addressing the health benefits and risks, involving vitamin D or skin cancer, of increased sun exposure. Proc Natl Acad Sci USA. 2008;105:668–73.
2. Thomas MK, Lloyd-Jones DM, Thadhani RI, Shaw AC, Deraska DJ, Kitch BT, et al. Hypovitaminosis D in medical inpatients. N Engl J Med. 1998;338:777–83.
3. Dusso AS, Brown AJ, Slatopolsky E. Vitamin D. Am J Physiol Renal Physiol. 2005;289:F8–28.
4. Ovesen L, Brot C, Jaakobsen J.(2003). Food contents and biological activity of 25-

hydroxyvitaminD:a vitamin D metabolite to be reckoned with? Ann Nutr Metb 47:107-113.
5. Institute of medicine,Food and nutrition board.Dietary Reference intakes for calcium and vitamin.Washington,DC:National academy press 2010.
6. Denise R. Ferrier. Vitamin in Lipponcot's biochemistry Reviews. Richard A. Harvey,Wolters Kluwer 6th edition 2014:373-394.
7. Ashique Ali Arain, Syed Muhammad Ali, Quamar Zaman Phull, Ali Abbas. Vitamin-D Deficiency: A Neglected Topic Alarms the Health Care Providers. JPOA .2017; 29 (3):7-10.
8. Hansen KE, Jones AN, Lindstrom MJ, Davis LA, Engelke JA, Shafer MM. Vitamin D insufficiency: Disease or no disease? J Bone Miner Res. 2008;23:1052–60.
9. Brown AJ, Slatopolsky E. Vitamin D analogs: Therapeutic applications and mechanisms for selectivity. Mol Aspects Med. 2008;29:433–52.
10. Imanishi Y, Inaba M, Seki H, Koyama H, Nishizawa Y, Morii H, et al. Increased biological potency of hexafluorinated analogs of 1,25-dihydroxyvitamin D3 on bovine parathyroid cells. J Steroid Biochem Mol Biol. 1999;70: 243–8.
11. Ahmad G, Hashmat N, Satti NK, Hypovitaminosis D; In children in ambulatory setting in Riyadh. Professional Med J 2015;22(12):1535-1540.
12. Ashique Ali Arain, Syed Muhammad Ali, Madiha Shah (2018). Vitamin D deficiency: A clinical problem searching for solution. Journal of Advanced Pharmaceutical Sciences and Technology 1(3):48-52.
13. Wegdan Bani-issa, Kamal Eldeirawi, Sondos Harfil, Randa Fakhry (2017). Vitamin D deficiency and its Determinants in Adults. A Sample from Community-Based Settings in United Arab Emirates. International Journal of Indocrinology.doi10.1155/2017/3906306.
14. F.F Zhang, S. Al Zenki et al (2016). Vitamin D deficiency is associated with high prevalence of diabetes in Kuwaiti adults: results from national survey. BMC Public Health 16(1):1 Hepatology2012;56(5)1641-1650.
15. Daniel D. Bikle. Agents that affect bone mineral homeostasis. In Katzung text book of Pharmacology 12th edition Mc Graw Hill, USA.2012;769-787