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COMPARATIVE STUDY OF THE STATUS OF VITAMIN D_3 IN YOUNG OFFICE WORKING WOMEN AND HOUSEWIVES IN UDAIPUR, RAJASTHAN

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ABSTRACT: Background: Vitamin D_3 deficiency continues to be an unrecognized epidemic in many populations around the world. Vitamin D is important for the absorption of calcium, and bone formation and maintenance. **Objective:** This study was carried out with an objective of evaluating the prevalence of low Vitamin D levels (insufficiency and deficiency) in female office workers and housewife's in Geetanjali medical college and hospital, Udaipur. **Material & method:** This study was carried out in Geetanjali hospital and medical college, a retrospective study conducted on 50 working and 50 housewife's subjects between age group 18-32 years. Body mass index (BMI) was calculated. Serum calcium, serum phosphorous, and alkaline phosphatase were determined by a fully-auto-analyzer. The serum level of Vitamin D_3 was measured using the electro chemiluminescence immunoassay methodology. **Results:** The difference in the BMI between the office workers and housewife's was statistically no significant. Vitamin D3 was 18.72 ± 6.97ng/ml (SEM0.987) in office worker's and 9.94 ± 6.14 ng/ml (SEM 0.869) in housewife's with a highly significant ($p<0.0001$) statistical difference. **Conclusion:** In all subjects there were low vitamin D_3 levels found. An urgent awareness with treatment of this deficiency must be undertaken to prevent any future consequences of Vitamin D deficiency in these young healthy females.

INTRODUCTION: In the liver, cholecalciferol (Vitamin D_3) is converted to calcidiol, which is also known as calcifediol (INN), 25-hydroxy cholecalciferol, or 25-hydroxyvitamin D_3 — abbreviated 25(OH)D_3. Ergocalciferol (Vitamin D_2) is converted in the liver to 25-hydroxy ergocalciferol, also known as 25-hydroxyvitamin D_2 — abbreviated 25(OH) D2. These two specific vitamin D metabolites are measured in serum to determine a person's Vitamin D status.[1, 2] One of the most important roles of Vitamin D is to maintain skeletal calcium balance by promoting calcium absorption in the intestines, promoting bone resorption by increasing osteoclast number, maintaining calcium and phosphate levels for bone formation, and allowing proper functioning of parathyroid hormone to maintain serum calcium levels.

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Vitamin D deficiency can result in lower bone mineral density and an increased risk of reduced bone density (osteoporosis) or bone fracture because a lack of Vitamin D alters mineral metabolism in the body.[3] Vitamin D deficiency continues to be an unrecognized epidemic in many populations around the world. [4]

It is generally agreed that the evaluation of the status of Vitamin D should be performed through the measurement of 25-hydroxy Vitamin D (25OHD) levels, though what constitutes a normal level of Vitamin D remains controversial. [5] The deficiency is prevalent not only in females or the elderly but also in free-living healthy young male adults. [6] It has been reported in healthy children, young adults, middle-aged adults, and the elderly, and is common among both males and females. The 25OHD concentration was found recently to be an independent determinant of peak bone mass.[7] Importantly, Lips *et al.* [8] and Heaney [9] concluded that adequate Vitamin D levels can prevent osteoporosis-related hip fractures. As expected, owing to lower Vitamin D levels, females were

found to have significantly lower serum calcium and higher mean PTH levels, possibly as part of an early secondary hyperparathyroidism leading to significantly lower serum phosphorus.[10] The lower level of alkaline phosphatase in females is possibly related to the use of oral contraceptive pills.[11]

In view of aforementioned controversial literature, we were aimed to evaluate the vitamin D3 status in young working women and housewives in Udaipur region**.**

MATERIAL AND METHODS:

This study was carried out in Geetanjali hospital and medical college. This was a retrospective study. Which were conducted on 50 working and 50 housewife's subjects. All the subjects for study were in age group between 18-32 years. All data for the study was obtained from the clinical biochemistry laboratory of geetanjali hospital.

Inclusion criteria for the study were subjects between age group 18-32 or not having any complained of severe illness. Exclusion criteria of the retrospective study were the subjects with any other clinical complained or any family history of diabetes type -2 or cardiac complained.

Height and weight of subjects were measured by standard protocol. Body mass index (BMI) was calculated. For the estimation of Serum calcium, serum phosphorous, alkaline phosphates, and Vitamin D_3, 5 ml blood were taken by standard protocol. Serum calcium, serum phosphorous, and alkaline phosphates were determined by a (cobas-c-311) fully-auto-analyzer. Serum calcium level were analysed by NM-BPTA (N-methy-bis Aminophenoxy ethane tetra acetic acid) Method. Serum phosphorous was analysed by molybdate UVmethod. Serum alkaline phosphatase was analysed by PNPP Method. The serum level of Vitamin D_3 was measured using the electro chemiluminescence immunoassay methodology by cobas e- 411.

Statistically analysis:

Results are presented as mean ± SD. A p value < 0.05 was considered significant. Statistical analysis was performed using GraphPad Prism version 5.00 for Windows (GraphPad software, San Diego California USA, www.graphpad.com).

RESULTS:

In our study we were compared level of Vitamin D3 in working women and housewife's. All the subjects of study group were young females. We were calculated the body mass index of all subjects in both group. The difference between body mass index of both group are (p value 0.2930) non significant.

While the difference in serum calcium and serum phosphorous in both group were statically significant, presented in table. Similar the difference between serum alkaline phosphates in office working women and housewife's were 70.14+18.47, 93.96+52.25, respectively. This was also statically significant (p0.0030).

TABLE 1:

Parameters	Office working women Mean ±SD	Housewife's Mean ± SD	p-value
BMI (kg/m2) Normal:18.5-25 Overweight:25-30 Obese:30-35 Severely obese:35-40 Very severely obese: over 40	23.02 ± 2.27	22.483±.14	0.2930 *
Serum Calcium (Range :8.5-10.5 mg/dl)	9.65 ±1.1	10.05 0±.794	0.0378 **
Serum Phosphorous (normal range:2.5-5mg/dl	3.55 ± 0.70	4.07 ±1.18	0.0095 **
Serum alkaline phosphate (normal range in Adults:35-129I.U./L)	70.14 ±8.47	93.96 ±2.25	0.0030 **
Vitamin D_3 (Normal range:9.3-47.9 ng/ml Insufficiency :10-30ng/ml Deficiency:<10ng/ml Toxicity:>100ng/ml	18.72 ± 6.97	9.94±6.14	<0.0001 **

BMI: body mass index * non significant , ** significant

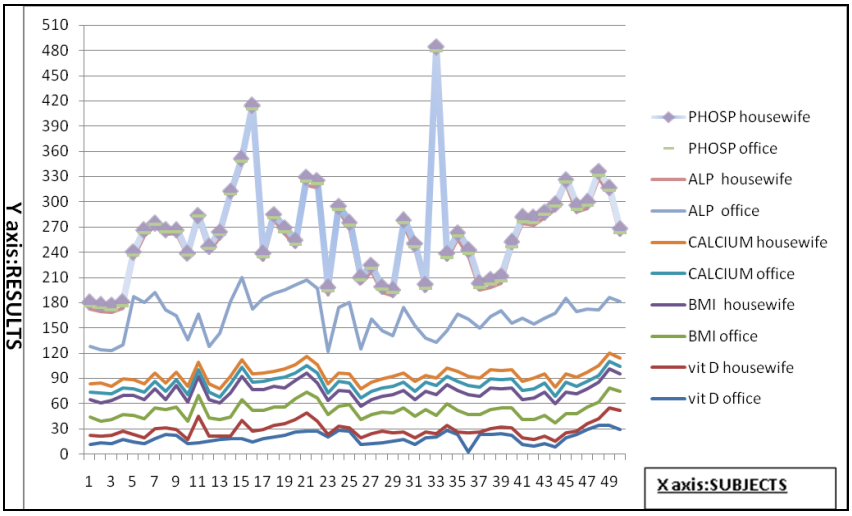

FIG.1: REPRESENT CORRELATION BETWEEN VARIOUS BIOCHEMICAL PARAMETERS ALONG WITH VITAMIN D_3 IN SUBJECTS.

In our study for the estimation of Vitamin D_3 the normal level of Vitamin D_3 is between 9.3-47.90ng/ml. The deficiency of Vitamin D_3 is < 10 ng/ml, insufficiency of Vitamin D_3 is between 10-30 mg/dl. The sufficiency level of Vitamin D_3 is between 30-100 ng/ml or toxicity of Vitamin D_3 is >100 ng/ml.

The mean of studied subjects were18.72 + 6.97, 9.94+6.14 in office worker women and housewife's respectively. It was reported that in office working women the level of Vitamin D_3 was in insufficiency level, while in housewife's the Vitamin D_3 level was in deficiency range. The difference between both group were (p0.0030) statically significant. The comparative studies of all subjects were shown in figure.

DISCUSSION: In the past few years, a consensus has developed among the experts in the field that the normal 25OHD level is >75 nmol/l (>30 ng/ml), while a level between 52 and 72 nmol/l (21–29 ng/ml) is defined as a state of insufficiency and a level of <50 nmol/l (<20 ng/ml) is consistent with deficiency. [12]

Vitamin D is important for the absorption of calcium, and bone formation and maintenance. With the prevalence of food-fortifying programs, it was thought that Vitamin D deficiency had been eradicated, but deficiency remains unexpectedly endemic in many parts of the world, and its prevalence appears to be increasing.[13] The deficiency is prevalent not only in females or the elderly but also in free-living healthy young male adults.[14] Ardawi *et al.*[15] reported an approximately 80% prevalence of hypovitaminosis D in 1172 Saudi women from the western region of Saudi Arabia, while Sadat-Ali *et al.*[16] found a 28% and 37% prevalence of hypovitaminosis in male patients aged 25–35 years and ≥50 years, respectively. Recently, González-Padilla *et al.*[17] reported a high prevalence of hypovitaminosis D in medical students from Spain, and Multani *et al.*[18] found that 87.5% of resident doctors from India had low Vitamin D levels.

In our study we were found a severe deficiency of Vitamin D_3 in housewives, while insufficiencies of Vitamin D_3 were found in working women.

The limitations of our study, this was a retrospective study, small number of data analyzed. There were no proper history of subject's dietary habitats, use of dairy products and sun light exposure.

CONCLUSION: In housewife's subjects there were low Vitamin D_3 levels found. An urgent awareness with treatment of this deficiency must be undertaken to prevent any future consequences of Vitamin D_3 deficiency in these young healthy females.

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REFERENCES:

1. Vitamin D Tests". Lab Tests Online (USA). American Association for Clinical Chemistry. Retrieved 23 June 2013.
2. Jump up to, Hollis BW (January 1996). "Assessment of vitamin D nutritional and hormonal status: what to measure and how to do it". Calcif. Tissue Int. 58 (1):45.Doi: 10.1007/BF02509538. PMID 8825231.
3. Bell TD, Demay MB, Burnett-Bowie SA (April 2010). "The biology and pathology of vitamin D control in bone". Journal of Cellular Biochemistry 111 (1): 13.doi:10.1002/jcb.22661. PMID 20506379.
4. Holick MF, Chen TC. Vitamin D deficiency: A worldwide problem with health consequences. Am J Clin Nutr. 2008;87:1080s–6s
5. Holick MF. Vitamin D status: Measurement, interpretation, and clinical application. Ann Epidemiol. 2009; 19:73–8.
6. Tangpricha V, Pearce EN, Chen TC, Holick MF. Vitamin D Insufficiency among Free-Living Healthy young Adults. Am J Med. 2002; 12:659–62.
7. Välimäki VV, Alfthan H, Lehmuskallio E, Löyttyniemi E, Sahi T, Stenman UH, et al. Vitamin D status as a determinant of peak bone mass in young Finnish men. J Clin Endocrinol Metab. 2004; 89:76–80.
8. Losking D, Lippuner K, Norquist JM, Wehren L, Maalouf G, et al. The prevalence of vitamin D inadequacy amongst women with osteoporosis: An international epidemiological investigation. J Intern Med. 2006; 260:245–54. [PubMed]
9. Heaney RP. Nutritional factors in osteoporosis. Annu Rev Nutr. 1993; 13:287–316.
10. Barone A, Razzano M, Pizzonia M, Oliveri M, Palummeri E,et al. High prevalence of secondary hyperparathyroidism due to hypovitaminosis D in hospitalized elderly with and without hip fracture. J Endocrinol Investig.2006; 29:809–13. [PubMed]
11. PM, Evans N, Bath LE, Warner P, Whitehead TJ, Critchley HO, et al. Physiological versus standard sex steroid replacement in young women with premature ovarian failure: Effects on bone mass acquisition and turnover.Clin Endocrinol (Oxf) 2010; 73:707–14. [PubMed]
12. Jones G, Horst R, Carter G, Makin HL. Contemporary diagnosis and treatment of vitamin D-related disorders. J Bone Miner Res. 2007; 11(Suppl 2):V11–5.
13. Lowdon J. Low vitamin D status: On the increase? J Fam Health Care. 2008; 18:55–7. [PubMed
14. Tangpricha V, Pearce EN, Chen TC, Holick MF. Vitamin D Insufficiency among Free-Living Healthy young Adults. Am J Med. 2002; 12:659–62. [PMC free article] [PubMed]
15. MS, Qari MH, Rouzi AA, Maimani AA, Raddadi RM. Vitamin D status in relation to obesity, bone mineral density, bone turnover markers and vitamin D receptor genotypes in healthy Saudi pre- and postmenopausal women. Osteoporos Int. 2011; 22:463–75. [PubMed]
16. Sadat-Ali M, Al-Elq A, Al-Turki H, Al-Mulhim F, Al-Ali AK. Vitamin D levels in healthy men in eastern Saudi Arabia. Ann Saudi Med. 2009; 29:378–82. [PMC free article] [PubMed]
17. Padilla E, Soria López A, González-Rodríguez E, García-Santana S, Mirallave-Pescador A, Groba Marco Mdel V, et al. High prevalence of hypovitaminosis D in medical students in Gran Canaria, Canary Islands (Spain)] Endocrinol Nutr. 2011; 58:267–73. [PubMed]
18. Multani SK, Sarathi V, Shivane V, Bandgar TR, Menon PS, Shah NS. Study of bone mineral density in resident doctors working at a teaching hospital. J Postgrad Med. 2010; 56:65–70. [PubMed

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