

Relation of Vitamin D Level with Demographic and Lab Feature for Local Population

Santosh Kumar, Zubair Almani, Suhail Ahmed Almani, Shafaq Nazia

ABSTRACT

OBJECTIVE: To analyze relationship of vitamin D status with Age, Gender, Occupation, Serum Calcium, ESR and Hemoglobin level in local population at Liaquat University of Medical & Health Sciences.

STUDY DESIGN: Cross-sectional observational study.

DURATION OF STUDY: Liaquat University Hospital in Medical ward and Out Patient Department (OPD) from 1st May 2015 - 1st December 2015.

METHODOLOGY: This cross-sectional observational study was conducted at Department of Medicine, LUMHS Hyderabad. All cases were collected from OPD of medical ward and emergency, after taking informed consent. A specifically designed semi structured proforma was used to record demographic, history, examination and laboratory reports including serum calcium, ESR, Hemoglobin and vitamin D level. Patients having chronic liver disease, ischemic heart disease, cerebrovascular disease, road traffic accident and others critical illness were excluded. Data entered into SPSS 20 version for analysis and p value.

RESULTS: A total of 160 patients were included in this study. The mean age of enrolled participants was 40.2±13.7 years. Ninety seven (60.6%) were females with female to male ratio of 1.5:1. One hundred thirty (81.3%) patients were seen in out-patient department of institute. One hundred and twelve (70%) patients are working at home. The mean hemoglobin level was 11±1.3 gm/dl, mean ESR 26.2±15.8, mean serum calcium 9.6±2 mg/dl and mean vitamin D3 level was 32±6.6 IU. Comparison of demographic and lab features of vitamin D deficient patients and with normal vitamin D was summarized in Table I.

CONCLUSION: In Pakistan vitamin D deficient sample are more prevalent in all age group. Study shows relationship of age, sex, occupation with serum hemoglobin level, erythrocyte sedimentation rate and serum calcium level. Study results show that vitamin D deficient is more in house workers, laborers, students and executive professional workers. Hemoglobin level was found low in vit D deficient patients as compared to vit D normal population but serum calcium, ESR were normal in both group of vitamin D deficient and controlled group of population.

KEY WORDS: Vitamin D, hemoglobin, age, gender, occupation.

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INTRODUCTION

Pakistan is country of more than 200 million population. Vitamin D deficiency is prevalent in our country in all age group from infants to adulthood. Vitamin D insufficiency leads to rickets in children, and osteomalacia in adult population. Many studies from different countries shows that vitamin D insufficiency is related with bony deformities, neurological complication, hypocalcaemia, dermatologic abnormalities and cardiovascular manifestations with aggravating depression etc. Various observational studies shows that there is

relationship of Vitamin D with demographic features like age, sex, occupation, hemoglobin, erythrocyte sedimentation rate and serum calcium with regulation of parathyroid hormone. Vitamin D (VD) is predominantly synthesized in the skin during exposure to ultraviolet B light. VD is also consumed in diet from plants (Ergocalciferol, D2) or animals / Fish (Cholecalciferol, D3). Both form of VD are converted in liver to 25 – hydroxyvitamin D is subsequently converted into active form in kidney 1, 25-dihydroxyvitamin D, the active hormone whose production is regulated by serum calcium, phosphorus, and PTH.1, 25(OH)2D binds to

cytoplasmic vitamin D receptors increasing absorption from the intestine and increasing reabsorption from in the renal tubule thereby reducing loss in urine. Active VD also stimulates osteoblastic activity to release RANKL that stimulates osteoblastic activity which release calcium from bone in blood⁷⁻⁹.

MATERIAL AND METHOD

Inclusion criteria: Male and female included in OPD in emergency department with no any critical and co-morbidities.

Exclusion criteria: Chronic liver disease, ischemic heart disease, Cerebrovascular disease and road traffic accident and others critically ill patients.

Data analysis

Data was entered and analyzed using SPSS version 20. The mean and SD was calculated for age, serum calcium, hemoglobin level, ESR and vitamin D3 levels. Frequency and percentages were calculated for gender, occupation of participant and type of admission. Comparison of vitamin D3 deficiency was done by age, serum calcium, hemoglobin level, ESR, vitamin D3 levels gender, occupation of participant and type of admission. Chi square test was applied for categorical variables and student “t” test for continuous variables by taking p-value of < 0.05 statistically significant.

RESULTS

A total of 160 patients were included in this study. The mean age of enrolled participants was 40.2±13.7 years. 97(60.6%) were females with female to male ratio of 1.5:1. One hundred thirty (81.3%) patients were seen in out-patient department of institute. One hundred and twelve (70%) patients are working at home. The mean hemoglobin level was 11±1.3 gm/dl, mean ESR 26.2±15.8, mean serum calcium 9.6±2 mg/dl and mean vitamin D3 level was 32±6.6 IU. Comparison of demographic and laboratory features of vitamin D deficient patients with normal vitamin D is summarized in Table I.

TABLE I: COMPARISON OF DEMOGRAPHICS AND LABS IN PATIENTS WITH VITAMIN D DEFICIENT STATUS WITH PATIENTS OF NORMAL VITAMIN D STATUS

Variables	Vitamin D status		P-value
	Deficient	Normal	
Age (years)	38.5±13.4	41.3±13.9	0.225
Gender			0.540
Female	39 (60.9%)	58 (60.4%)	
Male	25 (39.1%)	38 (39.6%)	

Occupation of patient			0.261
working at home	42 (65.6%)	70 (72.9%)	
Labor	9 (14.1%)	17 (17.7%)	
Professionals	8 (12.5%)	6 (6.3%)	
Students	5 (7.8%)	3 (3.1%)	
Type of admission			0.032
Emergency	17 (26.6%)	13 (13.5%)	
OPD	47 (73.4%)	83 (86.5%)	
Hemoglobin (Gm/dl)	10.9	11.9	0.147
ESR	26.3±16.4	26.1±15.4	0.948
Serum calcium (mg/dl)	9.4±2	9.7±2	0.329

DISCUSSION

The incidence of VD deficiency is increasing throughout the world as a result of diminished exposure to sunlight caused by urbanization, automobile, public transportation, modest clothing, sedentary life style and sunscreen use etc. Significant VD deficiency is found in 24.3% of post menopausal women from 25 countries. The incidence varied <1% in Southeast Asia, 29% in the United States of America and 36% in Italy⁷⁻⁹. The prevalence of VD deficiency is 3.5 % in USA, 12.5% in Italy amongst age over 65 years. VD deficiency is particularly common problem in institutionalized elderly patients, with incidence exceeding 60% in some groups not receiving VD supplements⁷⁻⁹. Insufficiency of vitamin D due to lack of sun exposure, malnutrition or malabsorption like chronic pancreatitis, cholestatic jaundice, celiac disease, inflammatory bowel disease etc. Study shows that majority of VD deficient is middle age group with female and male ratio (1.5-1) labors, students, housewife, executive worker profound deficiency of VD level. While as compared to serum calcium level erythrocyte sedimentation rate in both group are normal⁷⁻¹⁰. But serum hemoglobin level found low in VD deficient worker both male and female. Mostly patients were from out patients department (Table I). Various observational studies shows there is relationship of VD with demographic feature like age, sex, occupation, hemoglobin, erythrocyte sedimentation rate and serum calcium with regulation parathyroid hormone⁷⁻¹².

CONCLUSION

Hemoglobin level found low in VD deficient patients as compared to population having normal VD, however serum calcium, ESR were normal in both groups : vitamin D deficient and population with

normal VD. To elaborate cause effect relationship, studies with larger sample are needed.

REFERENCES

1. Nimitphong H, Holick MF. Vitamin D status and sun exposure in Southeast Asia. *Dermatoendocrinol.* 2013;5(1):34-7.
2. Song HR, Kweon SS, Choi JS, Rhee JA, Lee YH, Nam HS, et al. High prevalence of vitamin D deficiency in adults aged 50 years and older in Gwangju, Korea: the Dong-gu Study. *J Korean Med Sci.* 2014;29(1):149-52.
3. Cinar N, Harmanci A, Yildiz BO, Bayraktar M. Vitamin D status and seasonal changes in plasma concentrations of 25-hydroxyvitamin D in office workers in Ankara, Turkey. *Eur J Intern Med.* 2014;25(2):197-201.
4. Khan AH, Nauruan G, Iqbal R, Dar FJ. Assessing the effect of dietary calcium intake and 25 OHD status on bone turnover in women in Pakistan. *Arch Osteoporos.* 2013;8(1-2):151.
5. Okazaki R. [Updates on rickets and osteomalacia: vitamin D deficiency: its pathophysiology and treatment]. *Clin Calcium.* 2013;23(10):1483-9.
6. Schodin BA. Vitamin D testing: the controversy continues. *MLO Med Lab Obs.* 2014;46(6):16,18.
7. Shuler FD, Schlierf T, Wingate M. Preventing falls with vitamin D. *W V Med J.* 2014; 110(3):10-2.
8. Ritterhouse LL, Lu R, Shah HB, Robertson JM, Fife DA, Maecker HT, et al. Vitamin d deficiency in a multiethnic healthy control cohort and altered immune response in vitamin D deficient European-American healthy controls. *PLoS One.* 2014;9(4):e94500
9. Iftikhar R, Kamran SM, Qadir A, Haider E, Bin Usman H. Vitamin D deficiency in patients with tuberculosis. *J Coll Physicians Surg Pak.* 2013;23(10):780-3.
10. Iqbal R, Jafri L, Haroon A, Habib Khan A. Illuminating the dark side--vitamin D status in different localities of Karachi. *J Coll Physicians Surg Pak.* 2013;23(8):604-6.
11. Fernández Martínez Mdel M, Gómez Llorente JL, Martín González M, Momblan de Cabo J, Bonillo Perales A. [Tetany secondary to deficiency rickets]. *Nutr Hosp.* 2012; 27(2):656-8.
12. Hossain N, Khanani R, Hussain-Kanani F, Shah T, Arif S, Pal L. High prevalence of vitamin D deficiency in Pakistani mothers and their newborns. *Int J Gynaecol Obstet.* 2011;112(3):229-33.
13. Mansoor S, Habib A, Ghani F, Fatmi Z, Badruddin S, Siddiqui I, et al. Prevalence and significance of vitamin D deficiency and insufficiency among apparently healthy adults. *Clin Biochem.* 2010;43(18):1431-5.
14. Zuberi LM, Habib A, Haque N, Jabbar A. Vitamin D Deficiency in ambulatory patients. *J Pak Med Assoc.* 2008 Sep; 58(9):482-4.
15. Kift R, Berry JL, Vail A, Durkin MT, Rhodes LE, Webb AR. Lifestyle factors including less cutaneous sun exposure contribute to starkly lower vitamin D levels in U.K. South Asians compared with the white population. *Br J Dermatol.* 2013;169(6):1272-8.
16. Soliman AT, De Sanctis V, Elalaily R, Bedair S, Kassem I. Vitamin D deficiency in adolescents. *Indian J Endocrinol Metab.* 2014;18(Suppl 1):S9-S16.
17. Angurana SK, Angurana RS, Mahajan G, Kumar N, Mahajan V. Prevalence of vitamin D deficiency in apparently healthy children in north India. *J Pediatric Endocrinol Metab.* 2014; 27(11-12):1151-6.
18. Kim JH, Chang JH, Kim DY, Kang JW. Association between self-reported sleep duration and serum vitamin D level in elderly Korean adults. *J Am Geriatric Soc.* 2014;62(12):2327-32.
19. Chei CL, Raman P, Yin ZX, Shi XM, Zeng Y, Matchar DB. Vitamin D levels and cognition in elderly adults in China. *J Am Geriatric Soc.* 2014;62(11):2125-9.



AUTHOR AFFILIATION:

Dr. Santosh Kumar (*Corresponding Author*)
Assistant Professor, Department of Medicine
Liaquat University of Medical & Health Sciences
(LUMHS), Jamshoro, Sindh-Pakistan.
Email: dr_santosh72@yahoo.com

Dr. Zubair Almani
Student, LUMHS, Jamshoro, Sindh-Pakistan.

Dr. Suhail Ahmed Almani
Professor, Department of Medicine
LUMHS, Jamshoro, Sindh-Pakistan.

Dr. Shafaq Nazia
Registrar, Department of Medicine
LUMHS, Jamshoro, Sindh-Pakistan.