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OBESITY;
ASSOCIATION OF SERUM VITAMIN D LEVELS

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ABSTRACT…Objectives: The main aim of the study was to evaluate the association between serum Vitamin D levels with Obesity. **Study Design:** Case-Control study. **Place of Study:** Department of Medical OPD Liaquat Medical University Hospital, Jamshoro/Hyderabad, Sindh, Pakistan. **Duration of Study:** June 2015 to December 2015. **Material &Method:** Total 200 subjects including 100 Non obese as control group & 100 obese subjects participated voluntarily in this study. This study was conducted in Medicine Department of Liaqat University Hospital Jamshoro/Hyderabad. Serum Vitamin D Levels were measured by commercially available kit. **Results:** This research found that the serum vitamin D levels are less in obese persons as compared to non-obese people. **Conclusion:** Vitamin D levels are less in obese when compared to non-obese.

Key words: Serum Vitamin D, Obesity,

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INTRODUCTION

In developed countries obesity causing increased incidence of many diseases. Mostly peoples are at the risk for developing Angina, Myocardial infarction, Diabetes, bony disorder due to increased body weight. Nowadays vitamin D status has been observed that there is relation between high bodyweights with vitamin D.[1] "Obesity and vitamin D deficiency both are areas of active public health concern".[2] Obesity also effect the biochemical and physiological functions of vitamin D.[3]

Vitamin D has an important role during bone formation, metabolism and maintenance of normal calcium levels.[4] Normal growth & development of bones mainly influence by Vitamin D.[5] Vitamin D has less potency for storage which is obtained from dietary sources with comparison of vitamin formed from skin.[6] "It has also been suggested that the metabolic clearance of vitamin D may increase in obesity, possibly with enhanced uptake by adipose tissue. Obesity-associated vitamin D insufficiency is likely due to the decreased bioavailability of vitamin D3 from cutaneous and dietary sources because of its deposition in body fat compartments".[6] In different countries of world they observed by different researches that vitamin D level has been decline with increased BMI and obesity.[7,8] In addition to its musculoskeletal effects, evidence suggests that individuals with vitamin D deficiency are at increased risk of cardiovascular morbidity andmortality.[9,10] It is estimated that in 2030, >2 billion individuals would be overweight, and 1 billion would be obese.[11]

The prevalence of increased body mass index and overweight in Pakistani population is 25.0%[12], and over weight as well as obesity is the invitation to co morbidities.[13] For this research, BMI >25.7 is considered as obese and BMI from 18.5 to 22.9 is considered as normal and vitamin D3 level >75nmol/L; considered as sufficient, 50-75ng/dl as sub optimal levels, 25 and 50ng/mL as Vitamin D insufficiency and levels < 25 ng/dl considered deficient.[9,10]

OBJECTIVE

To evaluate the relationship between vitamins D3 level with obesity and non-obesity.

METHODOLOGY

This study was carried out at medical OP D of Liaquat university medical hospital Hyderabad Sindh. Total 200 subjects included in this study from which 100 non as control group and 100 obese as case study group. The body mass index (BMI) is calculated by the measuring of height & weight. To calculate BMI weight in kilograms divided by height in meters square. BMI categorized according to the Asian classification of BMI.

Three ml blood collected intravenously after all aseptic measures and sent to Diagnostic and Research Laboratory of LUMHS. "Serum vitamin D3 levels determined by using 3L52 ARCHITECT 25 –OH Vitamin - D Reagent kit under manufacturer's instructions". The data entered in predesigned proforma.

Data analysis: The data analyzed by using SPSS version 16.Continuous variables i.e., vitamin D3 levels are uttered as mean (standard deviation) and categorical variables i.e., status of vitamin D, are on hand as number (percentage). The comparisons of the continuous variable (levels of vitamin D3) between the overweight and thin lean subjects by application of Student's *t* test.

RESULTS

Vitamin D3 levels, in 2% of the obese and 61% of the non - obese was more than 75 nmol/l (sufficient status); 6 % of the obese and 12% of the non - obese was 25-75nmol/litre (suboptimal status); 52% of the obese and 17% of the non - obese between 25 - 50nmol/L (insufficient status) and 40% of the obese and 10% of the non-obese <25nmol/L (deficient status). Mean±SD of the vitamin D3 levels in obese is 31.30±14.28 and in non - obese group is 66.17±21.44. The p value was <0.05 that is statistically significant.

Category	mean±SD	P value
Male Obese Non - Obese	 31.306±14.28 66.718±21.44	<0.05*
Female Obese Non - Obese	 26.098±16.23 63.784±20.14	<0.05*

Table-I.

Category	Frequency
VIT D LEVELS IN OBESE	
Sufficient	2%
Sub optimal	6%
Insufficient	52%
Deficient	40%
VIT D LEVELS IN NON OBESE	
Sufficient	61%
Sub optimal	12%
Insufficient	17%
Deficient	10%

Table-II.

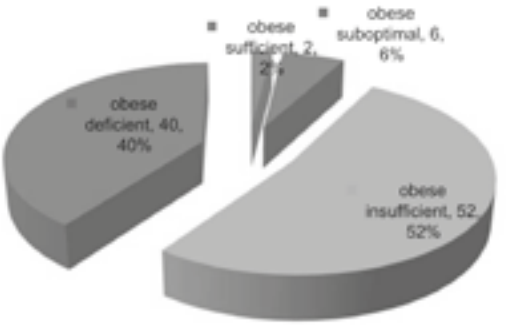

Figure-1. Vitamin D levels in obese

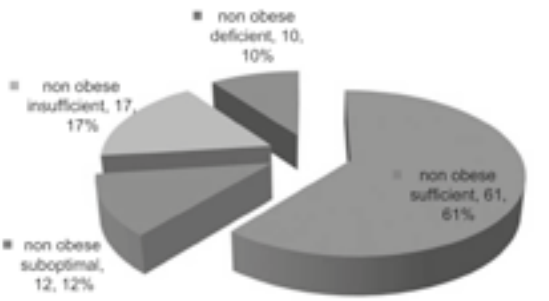

Figure-2. Vitamin D levels in nonobese

DISCUSSION

This research found that the serum vitamin D3 levels were decline in adiposity peoples as compared to non-adiposity peoples; these findings are consistent with the results of Parikh et al & Rock et al who also revealed that serum 25hydroxy vitamin D levels inversely proportional to the BMI and serum 1, 25-vit D levels also negatively correlated with BMI. They found that lower 25-OH-vit D and 1, 25-vit D concentrations in obese adults were independent of age, sex, or race.[8]

"The effect of BMI on serum vitamin D levels may be explained by the fact that persons with high BMI usually have a high content of body fat, acting as a reservoir for lipid-soluble vitamin D. It has previously been shown in animal models that body adipose tissue can accumulate about 10-12% of a supplemented dose of vitamin D. At the same time, the release of vitamin D from the fat is extremely slow and proportional to the concentration of the vitamin in the adipose tissue. This biological mechanism may have the purpose of protecting the body from toxic effects of active forms of vitamin D and maintaining an optimal level in the blood. However, excess body fat results in its increased sequestration and low availability and, as a consequence, low serum vitamin D levels.[1]" Because obese peoples having high capacity of storage of vitamin D which is also fat soluble vitamin due to presence of bulk of adipose tissues. Wortsman et al concluded in their study that when same quantity of UV radiation were exposed in same quantity to obese & non-obese population there was same effect on vitamin D3 levels that increased in both groups of study. The more levels of vitamin D3 are produced in obese people due to large surface area resulting increased level of vitamin D3 as compared to non-obese group. However, the increase in blood vitamin D3 concentrations was 57% less in the obese than in the non-obese subjects 24 h after the exposure. "The content of the vitamin D3 precursor 7-dehydrocholesterol in the skin was not significantly different between obese and non-obese subjects. Furthermore, the percentage conversion to previtamin D3 and vitamin D3 was similar in both groups. Thus, obesity did not affect the capacity of the skin to produce vitamin D3, but may have altered the release of vitamin D3 from the skin into the circulation.[6]"

CONCLUSION

this study concluded that vitamin D3 levels were declining in obese as compared with non-obese but there was also some limitations due to life style, dietary habits etc. this study gives a message to maintain proper vitamin D3 levels especially in obese people for prevention of many alarming and life disturbing disease in younger age as well as in elder age.

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"Honesty is an expensive gift,
so don't expect it from cheap people."

Unknown

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Keenjhar Rani	Focal of conduct research	
2	Ali Raza Memon	Hypothesis designing & article arrangement	
3	Muhammad Akram	Manuscript design& Finalization	
4	Paras Javed Memon	Data collection & Compilation	