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Effect of Obesity and Lipid Profile on Calcium and Vitamin-D Levels

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ABSTRACT

The importance of vitamin D status as a novel risk factor for various chronic diseases has gained more interest. Recently hypercholesterolemia and hypertension are found to be more prevalent in not only obese but also in non-obese individuals. Also, the association between Vitamin D status and metabolic syndrome has been one area of recent study. This study was done to identify if there is any significant relationship between vitamin D and body mass index (BMI). It was found that obese subjects, who had a BMI ranging from 30 to 40 had a higher vitamin D level when compared to non-obese subjects, who had a BMI <30 and it was statistically significant. When compared to non-obese with obese and there was a positive correlation between BSA and BMI. Vitamin D total cholesterol, calcium levels were significantly more in obese when compared to non-obese. The average VLDL and LDL were high in obese, and HDL was low in obese when compared to the non-obese.

Key words: Obese, BMI, Hypertension

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INTRODUCTION

Obesity is becoming a major threat to our survival, despite affecting our own system it causes mental stress and depression. Physical activities of every individual have come down and exposure to sunlight exposure is also reduced in today's life and hence it became the major cause of obesity. To Compare the Vitamin D, serum calcium Levels and total cholesterol among Obese and Non-Obese Individuals. To correlate total cholesterol with vitamin D to correlate BMI with Total cholesterol and to correlate serum calcium with vitamin [1-5].

MATERIALS & METHODS

Study design: After getting approval from the Institutional Ethical Committee, an informed written consent was obtained from all the participants of our study protocol.

Subjects were asked to come for the collection of blood sample after 12 hours of overnight fasting. All systems were thoroughly examined clinically for each subject, including checking of heart rate, Blood pressure (using Sphygmomanometer), temperature and respiratory rate.

Samples were collected between 7 am and 8 am.Using aseptic precautions, 3 ml of Blood were collected from all the subjects using a 5 ml syringe in the central lab of the Department of Physiology in SBMCH. After estimating serum calcium (arsenazo method) and lipid profile (cholesterol-chod-pap enzymatic photometric test. HDL-C immuno fluorescent method. TGL-calorimetric enzymatic test using glycerol 3 phosphate oxidase) in the Central Lab of SBMCH, the serum samples were stored in deep freezer at minus 20 degree Celsius.

Serum 25(OH) vit-D levels were obtained by "Enzyme Immuno. Assay for the Quantitative Determination of 25 (OH) vit-D in human serum or plasma" on the same day of opening the Kit for Vitamin D assay

A total of 40 subjects were used in the study of both obese and non-obese persons. All biochemical assessments were performed. Serum Vitamin D levels were also determined. Serum cholesterol and calcium levels were also analysed.

RESULTS

Vitamin D levels in obese and non-obese subjects was significantly higher in obese when compared to the non-obese. When total cholesterol was compared between obese and non-obese people, there was no statistically significant difference between the two groups.

The level of calcium in obese and non-obese subjects when it was compared, it was found that there is no statistical significance between the two groups, the obese subjects, on an average, had a higher value than the non-obese (Table 1).

Table 1: Correlation of BMI/Vitamin D/calcium/Total cholesterol/ in all subjects.

		BMI	Vitamin D	Calcium	TC
BMI	Pearson Correlation	1	0.105	0.012	0.067
	Sig. (2-tailed)		0.521	0.941	0.682
	N	40	40	40	40
Vitamin D	Pearson Correlation	0.105	1	0.016	0.059
	Sig. (2-tailed)	0.521		0.921	0.716
	N	40	40	40	40
Calcium	Pearson Correlation	0.012	0.016	1	0.053
	Sig. (2-tailed)	0.941	0.921		0.747
	N	40	40	40	40
TC	Pearson Correlation	0.067	0.059	0.053	1
	Sig. (2-tailed)	0.682	0.716	0.747	
	N	40	40	40	40

DISCUSSION

The present study was done to identify if there is any significant relationship between vitamin D and body mass index (BMI). lt was found that obese subjects, who had a BMI ranging from 30 to 40 had a higher vitamin D level when compared to non-obese subjects, who had a BMI <30 and it was statistically significant. We also calculated the body surface area (BSA) for all subjects and correlated it with Vitamin D. There was a positive correlation between total cholesterol and Vitamin D, and between vitamin D and serum calcium, but it was not statistically significant. When we compared the total cholesterol levels in obese and non-obese it was slightly higher in obese when compared to non-obese, but no significant correlation was observed between vitamin D and cholesterol levels. 7-dehydrocholesterol on irradiation with sunlight is converted to Vitamin D. Hence it is possible that obese people might have more of total cholesterol that might play a role in increased vitamin D synthesis in obese than in non-obese subjects. In a study done by Catherine et al, they have postulated that Obese adolescents face an increased risk for deficiency because they tend to absorb vitamin D in their fat stores, which prevents it from being utilized in their blood. The importance of vitamin D status as a novel risk factor for various chronic diseases has gained more interest. Recently hypercholesterolemia and hypertension are found to be more prevalent in not only obese but also in non-obese individuals [6-10].

CONCLUSION

The levels of total cholesterol were higher in obese people and correlated positively with vitamin D. Calcium levels also positively correlated with Vitamin D, which may be because vitamin D enhances calcium absorption. Obese people have an increased BMI and hence have more total BSA. The total cholesterol in obese people is also comparatively elevated than non-obese. When the BSA increases, naturally the obese people will have more sunlight exposure for that surface area. Hence it is possible that the average vitamin D synthesis might be higher in obese than non-obese. Vitamin D enhances intestinal absorption of calcium. Hence the average level of calcium was higher in obese than nonobese. In contrast to other works, we had a significant elevation of vitamin D levels in obese when compared to non-obese.

FUNDING

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ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. Umesh Kapil. Obesity trends in india and consequences. Indian Pediatr 2002; 17:449-452.
2. Dixon JB, Dixon ME, O'Brien PE. Depression in association with severe obesity: Changes with weight loss. Arch Internal Med 2003; 163:2058-65.
3. Ramagopalan SV, Heger A, Berlanga AJ, et al. A ChIP-seq defined genome-wide map of vitamin D receptor binding: Associations with disease and evolution. Genome Res 2010; 20:1352-60.
4. Holick MF . High prevalence of vitamin D inadequacy and implications for health. Mayo Clin Proc 2006; 81:353-73.

5. Schmitz J, Klein L, Jam C, et al. Bichromatic determination of total calcium m serum with Araenazo ifi. Clin Chem 1986; 32:1198.
6. Reilly T, Fields S, Kaufman BA. New improved calcium method for the cobaschemistry systems using Arsenazo ifi. Clin Chem 1988; 34:1236.
7. Penson J, Docherty S. Calcium determination on random-access analyzer with Arsenazo ifi. Clin Chem 1990; 36:1195.
8. Cheng-Shiun He, Michael Gleeson, et al. Fraser. Measurement of circulating 25-hydroxy vitamin d using three commercial enzyme-linked immunosorbent assay kits with comparison to liquid chromatography: Tandem mass. ISRN Nutrition 2013; 1-6.
9. Bruce W. Hollis. the determination of circulating 25-hydroxyvitamin D: No easy task. J Clin Endocrinol Metabol 2004; 89:3149-3152.
10. Morgan BR, Artiss JD, Zak B. Calcium determination in serum V with stable alkaline Arsenazo III and triglyceride clearing . Clin Chem 1993; 39:1608-1612.