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Research Article

A STUDY REVEALING THE EFFECTIVENESS OF VITAMIN D3 SUPPLEMENT FOR OVER-WEIGHT PERSONS

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Abstract:

Purpose: The purpose of this study is to ascertain consequences of vitamin D3 supplement for the person with over-weight and obese body. **Design of Study:** Descriptive and cross-sectional. **Place and duration:** Material for this study was gathered from four different hospitals of Rawalpindi. The time frame of this was from January, 2018 to December, 2018. **Methodology and Material:** According to the randomized methodology of table, the obese persons are equally distributed two groups, named group A and group B, having 44 persons each. In this study the domination was of male participants having 81 percentage of total patients with 71 males. The persons of group A were treated with vitamin D3 supplementation for the period of three months and named as an involvement group whereas the persons of group B were treated with palliative named as placebo group. The mean ages for the both groups were as former with 38.561 ± 7.282 years and later with 37.852 ± 8.251 years. At the commencement of the study, some typical anthropometric parameters comprising on BMI, waist Hip Ratio, and waist perimeter are measured and recorded on the premeditated forms. At the accomplishment of treatment replication of serum vitamin D3 was done and repeated all parameters measured after three months. **Results:** Comparative body weight outcomes beforehand and subsequently intervention of involvement group in the persons on the supplement of Vitamin D3 showed the insignificant difference in weight (76.563 ± 11.251 vs. 75.851 ± 10.763) with p-value of > 0.051 . Comparative waist hip ratio outcomes beforehand and subsequently showed insignificant difference of waist perimeter (92.781 ± 7.352 vs. 92.241 ± 7.212) and hip perimeter (107.741 ± 7.452 vs. 106.452 ± 7.121) with p-value of > 0.052 . Inconspicuous change is measured in BMI on the reference point 29.652 ± 3.263 and after 12 weeks of intervention 29.38 ± 3.1 kg/m² which is also insignificant difference statistically. **Conclusion:** Anthropometric parameters comprising on BMI, Waist Hip Ratio, waist perimeter did not got improvement after the intervention of vitamin D3 supplement for three months. Resultantly alteration of vitamin D3 level for the over-weight and obese persons does not support to minimize the anthropometric parameters.

Keywords: Vitamin D3 supplement, BMI, waist hip ratio, over-weight and obese

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INTRODUCTION:

Due to the imbalance between caloric intake and its consumption in the body, the over-weightness is increasing day by day, and the reason behind this misshape is today's lethargic lifestyle and lack in participation in physical activities. Over-weightness is basically developed for the reason of over fats in the human body and this becomes severe problem for its victims. It has very bad possessions on the human health. Over-weightness causes the key issue behind the many diseases such as diabetes, hyperlipidemia, hypertension, osteoarthritis, cardiovascular diseases and some typical cancers [1]. Including its health-related ruins, it has adverse financial consequences for the reason of its expenses of high cost. Consequently, probabilities for the many diseases are increasing and due to this civilizational productivity is plummeting [2]. Like the other world, prevalence of over-weightness is also on threatening level in the region of South Asia including Pakistan. The reason of this is hygienical conditions are ignored here. It is not the only the sovereign element for the low health-related issues but it creates a stream of fatal hazards behind it [3]. World Health Organization's (WHO) calculations for the year of 2016 in this regard shows that 4.8 percent peoples are suffering from obesity and 20.8 percent peoples are over-weighted in all over the world. When we talk about Pakistan these calculations are persisting here for a large period of time and prevalence of overweight is increasing [4]. This situation is gratifying threat which needs a lot of crucial considerations so why it can be controlled by taking the suitable actions. There is a huge amount of aspects are present which may be cause of over-weightness. Among them the key factors comprise on genomic, hormonal, metabolic and dietary, lethargic lifestyle and eating disorders [5]. Due to the imbalance between caloric intake and its consumption in the body, the over-weightness is increasing day by day. Among the people of emerging countries like Pakistan, there is obvious change observed in the diet design and in the physical activities in their daily life. In Pakistan, now a days, the diet is included with huge amount of fats, trans-fatty acids and high sugar which lead to the high caloric ingestion [6]. Several documents on this topic reflect the inter- relation between over-weightness and the deficit of vitamin D3 which further made the correlation with raised parathyroid hormone's level. The sickness prevalence of over-weightness and deficit of vitamin D are, today, issues of health of the peoples publicly. The interlink between over-weightness and deficit of vitamin D is a common issue in many societies on the other hand for metabolic syndrome is due to the irritation of the adipose tissue. In this perspective there is a conflicting perspective is present still there i.e. the exploit of vitamin D for the adipose tissue through VDR [7,8]. In

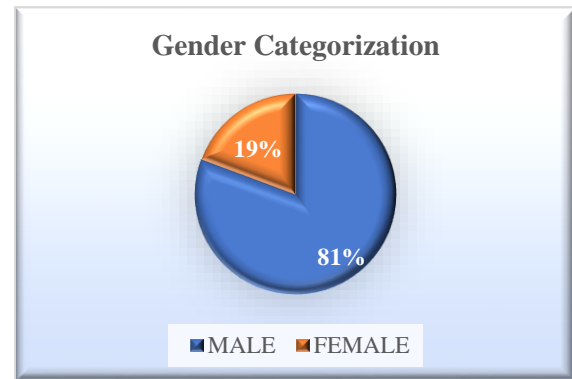
different studies on relation of vitamin D3 with the over-weightness clarified that the deficit of vitamin D3 in the obese and overweight persons is the one of the leading factors for its development. According to Saleh pour et al if levels of vitamin D conditionally reverted to its original values these have a result of losing the weight accordingly. Though, reports made by few other researchers showed an ambiguous interlink of vitamin D levels with the BMI of obese and overweight persons [9]. The purpose of our study is to ascertain consequences of vitamin D3 supplement for the person with over-weight and obese body by determining the interlink vitamin D3 and Body Mass index (BMI) in obese or over weight persons. Material collected for this study was gathered from four different hospitals of Rawalpindi by taking the permission from ethical committee of each hospital. The time frame of this was from March 2018 to August 2018. According to the randomized methodology of table, the obese persons are equally distributed two groups, named group 1 and group 2, having 44 persons each. At the commencement of the study, some typical anthropometric parameters comprising on BMI, Waist Hip Ratio, waist perimeter are measured and recorded on the premeditated forms. The sample collection was made by the assistance of World Health Organization's (WHO) calculations by referencing level of significance five percent, study power eighty percent, peoples SD of two, involvement group's average BMI 26.92 and placebo group's average BMI 27.52 [10]. At the accomplishment of treatment replication of serum vitamin D3 was done and repeated all parameters measured again. Patients of our study were seemingly well at the time of report in the hospitals. The patients of both genders are included in this study with the age range of 19 to 52 years and the enrollment is made on the reference BMI greater than 25kg/m². Exclusions of persons are made those were with severe diseases that can disturb or interrupt calculations of our study and the diseases are comprising on metabolic diseases, gastro-intestinal diseases, cardiovascular diseases, or renal diseases. Exclusions of persons are also made those were already on some other medication, persons on vitamin supplementation and persons those were on weight loss program. According to the randomized methodology of table, the obese persons are equally distributed two groups, named group 1 and group 2, having 44 persons each. The persons of group 1 were treated with vitamin D3 supplementation for the period of three months and named as an involvement group whereas the persons of group 2 were treated with palliative named as placebo group. Involvement group was the vitamin D3 supplementation group and supplemented with tablet of vitamin D3 of 25 µg/d as cholecalciferol. Placebo group was dosed with 25µg/d tablets for example lactose and these tablets are alike by their shade, magnitude, and

stuffing. Vitamin D3 supplement was dosed for the period of one year and this was supplemented at by the reference point from four weeks and eight weeks. Advice to keep normal plan of diet was given to individuals of study for the suggested time frame of one year and asked them to make the communication to the staff that was managing this study if they have any query or any question. Measurement for the height and weight of every individual was taken in normal dress by using the digital scales and found near to 00.10 unit and for the measurement of perimeters of hip and waist the procedure that was used was iliac crest level and this was done on horizontal plane. Measurement of BMI was done by using the formula $BMI = WT/HT^2$. The data related to the personal info i.e. name, age, gender and data of some typical anthropometric parameters comprising on BMI, Waist Hip Ratio, waist perimeters of the participants of study was logged on prescribed forms after completing the reference point time duration. At the accomplishment of treatment replication of serum vitamin D3 was done and repeat all parameters measured after three months. Another data collection was made on dietetic conducts and sunlight exposure of every participants of study. Everyday sunlight exposure of every participants was occupied the time not less than half an hour. Entry and analysis of respective data were made by using SPSS v-21. For the calculation of quantitative-data mean and SD were calculated and for qualitative-data was presented in frequencies by calculating the percentage. For the comparison of quantitative-data within the groups and across the groups paired sample tests and independent tests were taken. Significant p-value less than 0.050 was observed.

RESULTS:

In this study the groups were according to the randomized methodology of table, the obese persons are equally distributed two groups, named group A and

group B, having 44 persons each. In this study the domination was of male participants having 81 percentage of total patients with 71 males. The persons of group A were treated with vitamin D3 supplementation for the period of three months and named as an involvement group whereas the persons of group B were treated with palliative named as placebo group.



The mean ages for the both groups were as former with 38.561 ± 7.282 years and later with 37.852 ± 8.251 years. The mean height and weight of participants of group A were 158.65 ± 6.383 cm and 76.563 ± 11.252 kg respectively while mean height and weight of participants of group B were 159.75 ± 5.952 cm and 75.48 ± 12.092 kg respectively. The mean waist and hip of participants of group A were 92.781 ± 7.352 cm and 107.741 ± 7.452 cm respectively while mean height and weight of participants of group B were 91.492 ± 8.251 cm and 108.394 ± 8.093 cm respectively. The mean BMI calculations for the group A and group B were 29.652 ± 3.263 and 28.852 ± 4.365 respectively. For the both group the value of mean vitamin D3 level on the base of $25(OH)D$ was logged as 37.341 ± 29.331 (nmol/L)² in group A and 41.641 ± 31.283 (nmol/L)² in group B. All the presentations are presented in table-1.

Table-1: Reference Point Presentations of Individuals

PRESENTATIONS	GROUP-A	GROUP-B
	Mean \pm SD	Mean \pm SD
Age	38.561 ± 7.282	37.852 ± 8.251
Weight (kg)	76.563 ± 11.252	75.48 ± 12.092
Height (cm)	158.65 ± 6.383	159.75 ± 5.952
Waist (cm)	92.781 ± 7.352	91.492 ± 8.251
Hip (cm)	107.741 ± 7.452	108.394 ± 8.093
BMI (kg/m ²)	29.652 ± 3.263	28.852 ± 4.365
25 (OH) D (nmol/L) ²	37.341 ± 29.331	41.641 ± 31.283

Comparative body weight outcomes beforehand and subsequently intervention of involvement group in the persons on the supplement of Vitamin D3 showed the insignificant difference in weight (76.563 ± 11.252 vs. 75.851 ± 10.764) with p-value of > 0.051 . Comparative waist hip ratio outcomes beforehand and subsequently showed insignificant difference of waist perimeter (92.781 ± 7.352 vs. 92.241 ± 7.212) and hip perimeter (107.741 ± 7.452 vs. 106.452 ± 7.121) with p-value of > 0.052 . Inconspicuous change is measured in BMI on the reference point 29.652 ± 3.263 and after 12 weeks of intervention 29.382 ± 3.121 kg/m² which is also insignificant difference statistically. On the hand comparative relation of both groups for mean 25(OH) D level was as group A (Vitamin D3 group) presented with significant improved change by 37.341 ± 29.332 (nmol/L)² to 71.663 ± 26.532 (nmol/L)² on the completion of quarter period of total time duration but group B presented with no not significant p-value from reference point up to completion of quarter period of total time duration. All these parameters are shown in table-2.

PRESENTATIONS	START TIME	INTERVENE PERIOD	P-VALUE
	Mean \pm SD	Mean \pm SD	
Weight (kg)	76.56 ± 11.252	75.851 ± 10.764	0.668
Waist (cm)	92.781 ± 7.352	92.242 ± 7.214	0.697
Hip (cm)	107.741 ± 7.452	106.451 ± 7.123	0.243
BMI (kg/m ²)	29.652 ± 3.263	29.382 ± 3.121	0.572
25 (OH) D (nmol/L) ²	37.341 ± 29.331	71.663 ± 26.532	0.000

In group A (Vitamin D group) and group B (placebo group) in four presentations i.e. weight, waist and hip perimeters and BMI there were no significant difference (P-value more than 0.05) in their mean values while in 25(OH)D mean level of vitamin D there was found significant difference (P-value less than 0.05) after the intervene period of quarter of year. All the comparative presentations of both groups are shown in the table-3 with mean and standard deviation SD values.

PRESENTATIONS	GROUP A (VITAMIN)	GROUP B (PLACEBO)	P-VALUE
	Mean \pm SD	Mean \pm SD	
Weight (kg)	75.851 ± 10.764	75.290 ± 11.781	0.741
Waist (cm)	92.242 ± 7.214	91.1522 ± 8.080	0.345
Hip (cm)	106.451 ± 7.123	107.783 ± 7.682	0.234
BMI (kg/m ²)	29.382 ± 3.121	28.825 ± 4.263	0.322
25 (OH) D (nmol/L) ²	71.663 ± 26.532	48.462 ± 28.632	0.000

DISCUSSION:

Researches shows that there exists substantial relation of Vitamin D and calcium homeostasis and bone healthiness. Also, there is very important observation that vitamin D has opposing trend to the obesity and overweightness. Vitamin D inversely effect on the weight, fatty abdomen, wrinkles skin and BMI [11]. On the other hand, adipose tissue provides the store to vitamin D. About ten to twenty percent vitamin D supplement is stocked in these tissues. Absorption of vitamin D in these tissues has a direct proportion to that vitamin D which is released by fatty tissues whereas this absorption process continued slowly. Accumulated vitamin D by adipose tissues may be said the reason of minimal levels of vitamin D in blood [12, 13]. Outcomes of vitamin D for

the obese person to lose the weight are detected in many studies while the way by which these are influenced by vitamin D is not discussed with full details. Whereas at the same time this perspective is also exist that Lipid metabolism is in relation with vitamin D. the reason for this perspective is that adiponectin, which is a significant hormone, is pondered in relation with the vitamin D and it is comprised in lipid metabolism which further is cause for loss of weight [14]. According to Arunabhet al serum 25(OH)D₃ is finest marker to indicate the vitamin D levels in blood and he further explained that this serum has an inversely in relation with weight and also inversely in relation with hazards of overweightness and obesity [15]. If we study in with another angle VDR are exists in adipose tissue, and this existence of VDR for adipose

tissue may probably has a great part of contribution for the control of fats and this obviously has an interlink with management of weight control [16]. As per present research analysis it is revealed that little concentration of 25(OH)D3 individually in relation with obesity of abdomen while in according to another study little mixing level of calcitriol may cause buildup of fats in persons [17, 18]. In our study Comparative body weight outcomes beforehand and subsequently intervention of involvement group in the persons on the supplement of Vitamin D3 showed the insignificant difference in weight (76.563 ± 11.252 vs. 75.851 ± 10.764) with p-value of > 0.051 . Comparative waist hip ratio outcomes beforehand and subsequently showed insignificant difference of waist perimeter (92.781 ± 7.352 vs. 92.241 ± 7.212) and hip perimeter (107.741 ± 7.452 vs. 106.452 ± 7.121) with p-value of > 0.052 . Inconspicuous change is measured in BMI on the reference point 29.652 ± 3.263 and after 12 weeks of intervention 29.382 ± 3.121 kg/m² which is also insignificant difference statistically. On the hand comparative relation of both groups for mean 25(OH) D level was as group A (Vitamin D3 group) presented with significant improved change by 37.341 ± 29.332 (nmol/L)² to 71.663 ± 26.532 (nmol/L)² on the completion of quarter period of total time duration but group B presented with no not significant p-value from reference point up to completion of quarter period of total time duration. Our study made observations that anthropometric parameters comprising on BMI, Waist Hip Ratio, waist perimeter did not got improvement after the intervention of vitamin D3 supplement for three months. Even than some outcomes of studied showed that there is extensive link is present between fatty metabolic body and normal metabolic body parametric serum 25(OH) D3 but these outcomes are not further persisted in clinical examinations [19, 20]. In twelve different clinical examinations of metabolic analysis discovered not noteworthy diminution in fatty metabolic body it only possible if we control the caloric dose [21]. As per study of Sadiya et al, supplements of vitamin D3 have no effect on fatty metabolic body and perimeters of waist [22]. Results of our studies are opposite of other studies that's outcomes shoed that vitamin D3 has on effect on anthropometric parameters [23, 24]. It is very hard to distinguish that which mechanism is useful for the reduction of overweightness and obesity some evidences are there that declare contribution of vitamin D3 in this regard while on the other hand it is hard to clarify which factor is affecting element for the reduction of overweightness either it is vitamin D3 itself or it is calcium or others. In many different clinical examinations of metabolic analysis after completion of studies on under discussion topic discovered contradiction in their outcomes. Our study and current literature on this topic have insufficient material and information which can justify the role of vitamin D3 to reduce the overweightness and obesity. So, it is

concluded that to identify the relationship between the overweightness and its treatment with vitamin D3 it suggested to conduct distinct and intercessional study on this topic.

CONCLUSION:

Finally, we can make the conclusion that anthropometric parameters comprising on BMI, Waist Hip Ratio, waist perimeter did not got improvement after the intervention of vitamin D3 supplement for three months. Resultantly alteration of vitamin D3 level for the over-weight and obese persons does not support to minimize the anthropometric parameters.

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