ORIGINAL ARTICLE

Prevalence of Vitamin D Deficiency in Young Smokers

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ABSTRACT

Aim: To find out the prevalence of vitamin D deficiency in young smokers and to explore its relationship with sociodemographic and lifestyle variables like age, smoking, alcohol utilization and calcium intake through diet.

Methods: Total of 532 young adult smokers were included from Jan 2017 to Nov 2017.Most of the participants were young male patients vistis medical outdoor of services hospital lahore . For the purpose of multivariate regression analysis all the subject was categorize on basis of vitamin D efficiency in the serum; vitamin D efficiency (S-25[OH]D>50 nmol/L), Vitamin D insufficiency (25nmol/L ≤S-25[OH]D≤50 nmol/L), vitamin D deficiency (S-25[OH]D<25 nmol/L). Information on sociodemographic and lifestyle variables like age, smoking, alcohol utilization and calcium intake through diet was obtained by questionnaires.

Results: The incidence of vitamin D deficiency in 532 adult smokers with valid depth of S-25[OH]D and variables in questionnaire was analyzed. 206 young adult had vitamin D insufficieny, 117 had vitamin D deficiency of which 43 had severe vitamin D deficiency(S-25[OH]D<13.1 nmol/L). The prevalence of vitamin D deficiency was highest in male 2.03(1.63,2.93);obese adults 4.00(2.37-4.74);smokers 1.78 (1.24,1.93);adults who use fast food once a week 1.67(1.43,2.32); and adults who never exercised was 1.13(1.03,2.56).Multinomial regression analysis confirmed that a young smoker (19-29y) had 67% increased possibility of facing vitamin D deficiency compared to a non-smoker of the equal age group (p=0.048).

Conclusion: A high prevalence of vitamin D deficiency was indentified in young male adult smoker population. Modifiable risk factors such as smoking, preservation of normal BMI, and physical activity are all targets for improving vitamin D deficiency.

Keywords: Vitamin D, Smoking,Young adults, Sex, Fast food,Alcohol.

INTRODUCTION

Vitamin D is a fundamental nutrient needed for the progression of the bone metabolism and growth[1]. Vitamin D is required in various periods of human life including speedy growth of the embryonic maturation, during infancy, early childhood, during lactation, pregnancy and in the process of aging. Less availability of vitamin D during this life periods has severe effects on growth[2].

The significant role of vitamin D in bone health and strengthening has long been documented. Many recent researches have recommended that insufficient serum Vitamin D (25(OH)D) concentration is linked with bone loss , may cause secondary hyperparathyroidism anjd leading to high bone remodeling[3]. However, most of the researches demonstrating such type of relationships conducting in elderly people-especially in women-while researches on healthy and adult population are limited in many aspects[4].

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Mainly vitamin D found in two types: vitamin D_2,which is naturally found in foods from plant origin, and vitamin D_3 or cholecalciferol which is synthesized in the skin by exposure to ultraviolet light and is also found in foods of animal origin[5]. However, it is important to note that 25(OH)D concentration circulating in serum is good pointer of whole body vitamin D status and is used for the classification of vitamin D status into deficient (25[OH]D<20 ng/ml), Vitamin D insufficiency (25nmol/L ≤S-25[OH]D≤50 nmol/L), vitamin D sufficiency (25[OH]D≥30 mg/ml)[6].

Vitamin D deficiency is becoming a worldwide health issue with the expected high percentages of people suffering from vitamin D deficiency[7]. Therefore, the objectives of our research study were: to determine the prevalence of vitamin D deficiency in young adults, to investigate its relationship with smoking, BMI, alcohol consumption and dietary intake.

PATIENTS & METHODS

Total of 532 young adult smokers were included during Jan 2017 to Nov 2017 . Most of the participants were young male patients visits medical outdoor of services hospital lahore. All the

participants were young adults aged 20-42 years, mean age was 33.7 years. Exclusion criteria were any health related complications and treatment can affect vitamin D and bone metabolism, such as hyperparathyroidism, cancer, diabetes mellitus, pituitary gland diseases and rheumatic diseases. In addition participant has not taken vitamin D supplements for more than one year.

Vitamin D deficiency, smoking and age were taken as the dependent variable, while on the other hand gender ,education level, alcohol consumption , physical activity, obesity, and HDL-cholesterol level were taken as independent variables. All the participants gives non-fasting blood sample of 16 ml. The sample of serum was kept at -18 degree Celsius.

For the purpose of multivariate regression analysis all the subject was categorize on basis of vitamin D defficiency in the serum; vitamin D sufficiency (S-25[OH]D>50 nmol/L), Vitamin D insufficiency (25nmol/L $\leq$S-25[OH]D$\leq$50 nmol/L), vitamin D deficiency (S-25[OH]D<25 nmol/L). Information on sociodemographic and lifestyle variables like age, smoking, alcohol utilization and calcium intake through diet was obtained by questionnaires. Student t-test were applied. Relation between dependent variable [25(OH)D] and qualitative demographic clinical variables were compared. All variables are analyzed by using statistical package Statistical Package for Social Sciences vr 22.00 .

RESULTS

The incidence of vitamin D deficiency in 532 adult smokers with valid depth of S-25[OH]D and variables in questionnaire was analyzed. 206 young adult had vitamin D insufficieny, 117 had vitamin D deficiency of which 43 had severe vitamin D deficiency(S-25[OH]D<13.1 nmol/L). When come across age sub groups, participants aged 20-31 years had highest prevalence of vitamin D deficiency 59.4% and the lowest prevalence of vitamin D deficiency 7.3% was in age group of 37-48 years of age. The prevalence of vitamin D deficiency was highest in male 2.03(1.63,2.93);obese adults 4.00(2.37-4.74); smokers 1.78 (1.24,1.93); adults who use fast food once a week 1.67(1.43,2.32); and adults who never exercised was 1.13(1.03,2.56). Multinomial regression analysis confirmed that a young smoker (19-29y) had 67% increased possibility of facing vitamin D deficiency compared to a non-smoker of the equal age group (p=0.048). The multivariate regression analysis test reveals that smokers had 59% increased possibility of having vitamin D deficiency for the age 20-31 year age subgroup (p=0.071).In a view of vitamin D deficiency , many other factors are also make influence like obesity, alcohol consumption and high HDL level.

Table 1: Independent socio-economic,demographic and life style variables correlates with Vitamin D deficiency.

Variables	Optimal Range	Confidence Interval	p-value
Sex	1.43	0.7-1.3	0.16
Age,years	0.8	0.9-1.04	0.47
HDL	1.14	0.6-1.64	0.23
Obesity status	1.03	0.4-1.3	0.15
Abdominal Obesity	1.34	0.7-2.06	0.29
Smoking	1.54	1.9-2.34	0.014
Health Perception	1.29	0.87-1.73	0.057

25(HD) D level <25 nmol/L defined by demographic,socio-economic,dietry and lifestyle factors.

DISCUSSION

Vitamin D deficiency had been published and documented with a frequent public health issue in whole world so far. But this is the first ever study to describe the prevalence of vitamin D deficiency in young adult population in Pakistan(8). In this study the prevalence of vitamin D deficiency in smokers by comparing factors of socio-demographic status, obesity and alcohol consumption in healthy adults. Our results concluded that vitamin D level is alarming in young adult population[8].

Serum vitamin D low concentrations has been reported frequently in young adult population, particularly in urban area population. The huge variation in published data make confusion with comparison to international studies(9). Nonetheless, vitamin D deficiency in women were vigorously investigated and published but the adult population were ignored so far[9]. Regardless of vitamin D deficiency in most of the population and its implications in a wide range of skeleton and non skeleton diseases, the serum level of 25(OH) D that use as a parameter of vitamin D deficiency is still matter of debate[10].

In this study, we aimed to evaluate the effects of smoking in young adults on vitamin D levels[11]. The findings explore that the level of 25-Hydroxy vitamin D of the young adult smokers were much lower than optimal level and this difference is statistically

significant[12]. Eva N. Kassi et al, conduct a randomized control trail that define the effects of smoking on vitamin D level, they concluded that smoking reduces the vitamin D level in young population[13].

Rune Tonnesen et al also performed a prospective study in 2016 and concluded that almost one-fifth of the youth is experience from vitamin D deficiency and more than half had facing vitamin D insufficiency or worse(14). In this study, they concluded that causing factor in vitamin D deficiency were smoking, alcohol use, obesity, sedentary lifestyle and less exposure to direct sun light[15].

Young adults actively involving in sports activities are supposed to have higher circulating serum 25 Hydroxy vitamin D level[16]. In our own expectations , we observe that increasing time spent in exercise and healthy activities were directly associated with serum vitamin D level[17]. There is major role of healthy diet taken by the young adults[18]. There should proper implement of diet plan for certain age group, according to the requirement of healthy growth. So that deficiencies, which effect the population should be restricted[19].

There are many other risk factors that may have put adult population in high prevalence of vitamin D deficiency in Pakistan. With compare to normal weight subjects, the prevalence of vitamin D deficiency is much greater in obese and underweight adults and they were at higher probably at higher risks in respect of age and sex[20]. In the same way smokers are at higher risk to have vitamin D deficiency than non smokers. Even though the increased risk of vitamin D deficiency is considered to the less exposure to ultra-violet radiation, which is indispensable for the cutaneous synthesis of vitamin D3 but focus should be given on other risk factors like diet, smoking and alcohol consumption in activities of daily life[21].

CONCLUSION

A high prevalence of vitamin D deficiency was indentified in young adult smoker male population. Modifiable risk factors such as smoking, preservation of normal BMI, and physical activity are all targets for improving vitamin D deficiency.

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