Estimation of Total Testosterone levels in Sudanese Male Smoker

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Abstract

The effect of smoking on testosterone levels is important given the recent interest in the link between low levels of testosterone and the development of cardiovascular disease because smoking has bad effect on diet of person i.e. Heavy smoking lead to loss appetite for person. Cigarette smoking is highly prevalent among men. Many studies have evaluated the effect of cigarette smoking on levels of male reproductive hormones; however, the findings still remain controversial. The main objective was to study the effect of cigarette smoking on total testosterone hormone in male. Eighty blood samples (80) were collected from apparently healthy Sudanese individuals. Group one (40 males) was represented smoker group, age with 18-50 year, duration of smoking ranged from 5 – 25 years and average number of cigarette \ day is 17.18± 13.1. While other 40 individual are non smoker (Control), all volunteers were recruited from Khartoum city, Sudan. Four ml of venous blood were collected from each volunteer serum, Total testosterone were measured using (E L I SA) full automated hormone analyzer. The results were indicated that total testosterone levels among the smoker (M ±SD 3.6 ± 3.6) were significantly low compared with control group (M ± SD 5.2 ± 2.3). In addition, it is not effect by age and BMI (Body Mass Index), but it is effect by number of cigarette\ day.

Keywords: Smoker, Testosterone, Clinical,

Introduction

The health consequences of cigarette smoking and the use of other Tobacco products are well known because it increases morbidity in developed countries and the prevalence of cigarette smoking is increasing in the developing world [1]. Use of Tobacco leads to disease of heart and lung with smoking dieing a major risk factor for heart attacks, strokes, chronic obstructive pulmonary disease (C O P D), emphysema, cancer and males fertility due to the exposure time and level of dosage of Tobacco [2]. Testosterone is steroid hormones that regulate development of sperm, maintain muscle mass, and boost energy [3]. It is found in male and female, but male produce testosterone concentration about ten times that produced by female. It is also impotence for erective function which characterized by men's in ability to achieve or maintain an erection [4]. If man is a cigarette smoker, the vasoconstrictor smoker nicotine may be the culprit since it acts a vasoconstrictor which causes blood vessels to be narrower and reduce blood flow that lead to difficult to treat when cause by damage to blood vessels [5]. The long term exposure to smoking may cause nephropathy and colic like abdominal pain, it also cause small in queues in blood pressure, but chronic high level exposure for smoking have show to reduce fertility in males[6].

This study was carried out to estimation the influence of cigarette smoking on total testosterone level among Sudanese smoking and to determine the relationship between the levels of total testosterone with age, numbers of cigarette and BMI in smoking.

Materials and Methods

Material

80 male volunteers were used in this study during the period of March 2015 January. It is divided into group. Group one represented smoker with age ranged 18- 50 years and group two represented non smoker with age ranged 18- 50 years (control). This study was carried out in Khartoum State, Sudan.
Sample collection

Under a septic condition about 4 ml of venous blood were collected from each volunteer by using venipuncture technique and samples were placed in anticoagulant free containers, and allowed to clot, then samples were centrifuged at 3000 rpm about 15 mints, the obtained serum was kept in eppendorf tube in refregiatcr (-20 OC) until start analysis by using ELISA. This study was done according to guidelines approved by the ethical committee of Scientific Researches Deanship, Al-Neelain University.

Statistical analysis

Statistical evaluation was done by using Microsoft office excel (Microsoft office excel for windows 2007) and SPSS for windows version 16). Normal distribution of the studies variable was examined by using T- Test. Unpaired T-Test and Whitney U- test were used to assess significant difference in the means of the studied variables (smokers and non smokers).

Results and Discussion

Table (1) indicated that total testosterone level for smoker and non smoker cigarette was 3.6 and 5.2 g/ml, respectively. These results are indicated that total testosterone in smoker is significantly lower than non smokers (P = value 0.000). Several studies were also found that reduction in testosterone level were demonstrated by change in enzyme expiration in key tissues for androgen production and also point out the nicotine's has ability to alter hormones activities in male [7]. These findings are agreement with those results reported by [8]. While average age for smokers and non smoker was 30.24 and 28.40 years respectively. These results are indicated that age of smokers and non–smoker Sudanese males are to some extend similar. Whereas, average value of BMI for smokers and non smoker was 23.73 and 25.94, respectively. It was clearly indicated that BMI for smoker and non-smoker are closely to each other. These findings are not agreement with the results reported by [9]. While average numbers of cigarette smoking \ day for smokers was 17.18 \ day. Nicotine acts as competitive inhibitor of 3 alpha hydroxyl steroid dehyrogenase which responsible for converting dihederon testosterone to 3 alpha androstanclitary (DHT) and then accumulation of DHT leads to alter androgen hormone [10]. DHT is inactivated to 3 alpha androstondeiol by enzyme 3 alpha hydroxysteroid. Therefore, high number of cigarette smoking in short time lead to effect of total tester due to effect of nicotine on activated of 3 alpha androstanditary. But some study was demonstrated that there is increasing in correlation of BMI with number of smoke cigarette [11].

Conclusion

Total testosterone levels in the smoker were significantly low compared with non smoker group (P = value 0.000). In addition, it is not effect by age and BMI (Body Mass Index), but it is effect by number of cigaretteper day.

Table (1) indicated effect of age, BMI (Body mass index) and number of cigarette\ day on testosterone level among smoker and non smoker male

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group Study</th>
<th>P –Value</th>
</tr>
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<tr>
<td></td>
<td>Smokers</td>
<td>Non-smokers</td>
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<tr>
<td>Testosterone g/ml</td>
<td>3.6± 3.6</td>
<td>5.2± 2.3</td>
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<tr>
<td>Age (Year)</td>
<td>30.24± 6.4</td>
<td>28.40± 5.9</td>
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<tr>
<td>BMI</td>
<td>23.73± 3.5</td>
<td>25.94± 3.4</td>
</tr>
<tr>
<td>Number of cigarette\day</td>
<td>17.18± 13.1</td>
<td>---------</td>
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</tbody>
</table>

Reference


