Effects of the Anti-obesity Drugs Vita Slim and Green Tea on Certain Biochemical and Physiological Indices of Obese Adult Male Albino Rats

Eman G. E. Helal1*, Nora A. Aljalaud2, Ashraf M. M. Algendy3, Suzan S. Elpasty1

1Department of Zoology, Faculty of Science (Girls), Al-Azhar University.
2Biology Department, College of Science, Imam Abdulrahman Bin Faisal University, Saudi Arabia.
3Department of Physiology, Faculty of Medicine (Boys), Al-Azhar University, Egypt.

*Corresponding author: Eman G. E. Helal, Mobile: (+20) 01001025364, E-Mail: emanhelal@hotmail.com

ABSTRACT

Background: Because obesity is linked to an increased risk of diabetes and heart disease, the ideal anti-obesity medication would have weight loss that was long-lasting and had few side effects.

Objective: To detect if the weight-loss drugs; green tea and Vita slim negatively affect several biochemical and physiological markers.

Materials and Methods: Three groups consisted of 21 mature obese male albino rats (with a body weight of 220 ±20 gram): In Group one: control (vehicle treatment), in group two: for a period of 30 days, rats were given Vita slim (0.1mg/kg/day), and in group three: for 30 days, rats were given green tea (0.1 mg/kg/day).

Results: Significant changes were observed in the weight of the treated groups, in serum levels of AST/ALT, albumin, triglycerides, low-density lipoproteins (LDL), LDL/HDL ratio, urea, creatinine, as well as triiodothyronine (T3) as compared with the control group.

Conclusion: Several physiological and biochemical markers, including kidney and liver functions, have been shown to be negatively impacted by Vita slim and green tea after 30 days of ingestion.

Keywords: Anti-obesity drugs, Green tea, Hormones, Kidney functions, Lipid profile, Liver functions, Vita slim.

INTRODUCTION

A larger number and larger size of fat cells characterize as obesity, a condition that has a detrimental effect on one's health. Adipocytes in a person's fat tissue expand first in size, then in number, as weight is added to the body; conversely, as weight is reduced, adipocytes retract in size but not in number. Adipocytes are the fat cells found in the body of a person (1). Obesity is primarily caused by a deficit in energy expenditure relative to calorie intake (2). As a result, there are a variety of other factors, including environmental (e.g., diet, lifestyle, lack of physical activity, and some medicine), as well as genetic (e.g., predispositions inheritance to weight gain). Obesity, on the other hand, is often blamed on a poor diet and an unhealthy lifestyle (3). Overproduction of preadipocytes and differentiation into mature adipocytes are two important steps in obesity development (4).

Vita slim drug is composed from natural products. The formula of Vita slim contains many natural ingredients, which is clinically proven to lose weight by suppressing appetite and accelerating burning, and the most prominent components of the following: Garcinia camu camu, Gymnema herb, chromium, sweet potato fibres, green coffee extract and green tea extract(5).

Green tea may have a significant impact on body composition because of catechins, according to some researchers (6). Caffeine is also found in green tea, which has catechins. Camellia sinensis leaves are used to make green tea, which contains catechins, like epigallocatechin-3-gallate (7). Along with quercetin, theflavins, thearubigins, theflavinol, caffeine gallic acid, as well as chlorogenic acid (8). Green tea's weight-loss properties have been attributed to a variety of factors. Reduce food intake, interrupt lipid emulsification and absorption, decrease adipogenesis and the formation of fat, and increase energy expenditure via thermogenesis (fat burning), fat oxidation (fat burning), and fecal lipid excretion (fat excretion) (9).

This study aims to compare between two slimming drugs: Vita slim and green tea. Also, to explore the various effects of both on some physiological indices of obese adult male rats.

MATERIALS AND METHODS

Experimental animals

This study utilized a total of twenty-one albino male rats (220±20 g). Rats were purchased from animal unit of the Nile Pharmaceutical Company, Cairo, Egypt. They were housed in a room with controlled circumstances in well-aerated polypropylene clear cages (average dimensions 50 x 30 x 25 cm). We put 7 rats in each cage. Temperature ranges from 25 plus or minus 2°C, humidity of 55 ±5 percent, and a 12-hour light/dark cycle. Two weeks before the experiment, they were freely fed and watered, allowing them to adapt and detect any signs of pathological features.

Ethical approval

To ensure that all experiments were conducted in accordance with Al-Azhar University's Faculty of Science, Cairo, Egypt's "Ethics Committee for the Faculty of Science," Cairo, Egypt's, and "Guide for the Care and Use of Laboratory Animals" (NIH publication No. 85–23, 1996).

Drugs and chemicals

Med Care for Pharma Clinic, Egypt provided Vita slim pills (400 mg/capsule). In addition, green tea (in capsules form) was obtained Herbal company , Australia (400 mg/capsule).
Design of the study

The average weight of the rats used in this experiment was 220 plus or minus 20 g; they were divided into three groups of seven animals, as follows:

- **Group one** (control group) rats received daily deionized distilled water.
- **Group two** (Vita slim group): For 30 days, Vita slim was administered orally by gavage to each rat at a dose of 0.1 mg/kg/12 hours.
- **Group three** (green tea group) rats were administered green tea orally by gavage at the dose of 0.1 mg/kg/12 hours for 30 days.

**Both green tea and Vita slim were dissolved in distilled water before use.**

**Body weight (BW) evaluation**

A preliminary and final weighing was performed on the animals. The following calculation was employed to get the percent change in weight:

\[
\text{BW change percentage} = \frac{\text{Final BW} - \text{Initial BW}}{\text{Initial BW}} \times 100
\]

**Collection of blood samples**

At the end of the treatment, the animals were starved overnight and then anaesthetized with a light pentobarbitone anesthesia. Blood samples were collected from the retro-orbital venous plexus using capillary tubes. After centrifuging the blood for 10 minutes at 5000 revolutions per minute, the separated serum was preserved in an Eppendorf tube and refrigerated at -20 degrees Celsius until analysis was done.

**Measurement of serum biomarker**

**Glucose and insulin**

An enzyme-linked immunosorbent assay (ELISA) kit (U.E. Type) was used to quantify rat insulin quickly and accurately (Biovendor Research and Diagnostic product reff. (Czech republic) glucose level was measure by using BioMerieux kit. An online calculator was utilized to estimate HOMA-IR (Homeostatic Model Assessment of Insulin Resistance) by the Diabetes Trail Unit, University of Oxford, Oxford, United Kingdom \(^{(1)}\). HOMA-IR= Fasting serum insulin (µIU/ml) x Fasting serum glucose (mmol/L) / 22.5

**Protein profile**

This method was used to compute the serum globulin concentration using the BioMerieux kits which were used to measure total protein and albumin concentrations:

\[
\text{Globulin (g/dl)} = \frac{\text{Total protein (g/dl)} - \text{albumin (g/dl)}}{}
\]

**Lipid profile**

This study was conducted utilizing BioMerieux kits for the measurement of total cholesterol, total triglycerides, and high-density lipoprotein cholesterol. While LDL and VLDL cholesterol were calculated using Friedwald and Norbert's (Friedewald and Norbert) equations, respectively (VLDL). The TC/HDL (risk factor 1) and LDL/HDL (risk factor 2) ratios were obtained after measuring serum LDL-C and VLDL.

Friedewald's equation: LDL-C (mg/dl) = TC- {HDL + [TG/5]}. Norbert equation: VLDL = TG/5.

**Liver function enzymes**

Colorimetric assay kits (BioMerieux) were used for determining aspartate aminotransferase (AST) and alanine aminotransferase (ALT).

**Kidney function enzymes**

Renal function biomarkers were assessed through determination of serum creatinine and urea concentration by using BioMerieux kits.

**T3, T4, leptin and testesterone**

ELISA kits from Abcam were used to estimate testosterone, T3, and T4 levels, while an ELISA kit from (E0561Ra, Bioassay technology laboratory) was used to determine blood leptin.

**Statistical analysis**

Each set of seven rats was represented as a mean standard deviation (SD) of the biochemical data. The SPSS (Statistics Package for the Social Sciences) statistical software version v 19.1 was used to analyses the statistical differences between the control and test groups. A t-test was used to compare the two groups of normally distributed variables. P value 0.05 was considered statistically significant. It was judged highly significant when the P value was 0.001.

**RESULTS**

In terms of body weight, when Vita slim and green tea were administrated to animals, there was no difference in the percentage change in body weight between the two groups, but there was a significant decrease after 15 days when the test animals were compared to the control group. After 30 days, however, the change in body weight as a percentage dropped dramatically compared to control group (Table 1).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight change (15 days)</td>
<td>15.06 ± 2.38</td>
<td>9.33 ± 12.13</td>
<td>13.34 ± 7.49</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>-38.07%</td>
<td>28.43%</td>
<td></td>
</tr>
<tr>
<td>Body weight change (30 days)</td>
<td>62.40 ± 7.91</td>
<td>15.53 ± 18.00</td>
<td>30.53 ± 23.06</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>-75.12%</td>
<td>-51.08%</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group. * P<0.05, ** P<0.01 in comparison to control group.

Control and treatment groups had similar amounts of blood glucose and insulin. Comparing the Vita slim and green tea groups to the controls, no differences in glycemic indices were seen (Table 2).
Table (2): Pancreatic function of control, Vita slim and green tea groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose (mg/dl)</td>
<td>102.60±4.67</td>
<td>104.60 ± 13.96</td>
<td>104.80 ± 22.86</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>1.95%</td>
<td>1.96%</td>
<td></td>
</tr>
<tr>
<td>Insulin (mu/ml)</td>
<td>0.93±0.03</td>
<td>0.98 ± 0.03</td>
<td>0.95 ± 0.02</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>4.50%</td>
<td>1.93%</td>
<td></td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>0.24±0.03</td>
<td>0.26 ± 0.01</td>
<td>0.25 ± 0.01</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>7.38%</td>
<td>4.10%</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group.

HOMA-IR: The Homeostatic Model Assessment of Insulin Resistance

Rats treated with Vita slim and green tea capsules exhibited an extremely substantial increase in both AST and ALT activity compared to the control (Table 3).

Table (3): Liver function enzymes of control, Vita slim and green tea groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST (U/L)</td>
<td>74.80±10.76</td>
<td>96.60 ± 5.77 **</td>
<td>93.00 ± 9.46 **</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>29.14%</td>
<td>24.33%</td>
<td></td>
</tr>
<tr>
<td>ALT(U/L)</td>
<td>27.20±2.59</td>
<td>44.40 ± 4.56 **</td>
<td>43.60 ± 4.64 **</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>63.24%</td>
<td>60.29%</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group.

** P<0.01 in comparison to control group. AST: Aspartate transferase, ALT: Alanine transferase.

A/G ratio and albumin dropped significantly, while globulin increased dramatically in the Vita slim and green tea-treated rats as compared to the control group (Table 4).

Table (4): Protein profile of control, Vita slim and green tea groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total protein (g/dl)</td>
<td>6.38±0.22</td>
<td>6.99 ± 0.55</td>
<td>6.80 ± 0.69</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>9.59%</td>
<td>6.58%</td>
<td></td>
</tr>
<tr>
<td>Albumin (g/dl)</td>
<td>3.14±0.15</td>
<td>3.00 ± 0.29</td>
<td>2.90 ± 0.27</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>-4.46%</td>
<td>-7.64%</td>
<td></td>
</tr>
<tr>
<td>Globulin (g/dl)</td>
<td>3.24±0.19</td>
<td>3.97 ± 0.38 *</td>
<td>3.90 ± 0.45 *</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>22.59%</td>
<td>20.37%</td>
<td></td>
</tr>
<tr>
<td>A/G</td>
<td>0.97±0.09</td>
<td>0.76 ± 0.09 **</td>
<td>0.75 ± 0.05 **</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>-21.49%</td>
<td>-22.93%</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group.

* P<0.05, ** P<0.01 in comparison to control group. A/G: Albumin/Globulin ratio.

There was a significant decrease in the serum triglyceride and LDL levels of rats administered Vita slim and green tea compared with the control group. The Vita slim group revealed a decrease in LDL compared to the control group (Table 5).

Table (5): Lipid profile of control, Vita slim and green tea groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>86.40±3.78</td>
<td>85.1 ± 5.43</td>
<td>83.30 ± 5.99</td>
</tr>
<tr>
<td>% Change</td>
<td>-1.5%</td>
<td>-3.58%</td>
<td></td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>135±9.7</td>
<td>120.1 ± 10.13 *</td>
<td>119.02 ± 8.18 *</td>
</tr>
<tr>
<td>% Change</td>
<td>-11.03%</td>
<td>-1.18%</td>
<td></td>
</tr>
<tr>
<td>HDL-C (mg/dl)</td>
<td>52.60±6.58</td>
<td>48.00 ± 4.12</td>
<td>49.00 ± 3.44</td>
</tr>
<tr>
<td>% Change</td>
<td>-8.7%</td>
<td>-6.8%</td>
<td></td>
</tr>
<tr>
<td>LDL-C (mg/dl)</td>
<td>13.6±2.41</td>
<td>10.99±1.68*</td>
<td>10.02±2.76*</td>
</tr>
<tr>
<td>% Change</td>
<td>-19.43%</td>
<td>-26.55%</td>
<td></td>
</tr>
<tr>
<td>VLDL-C (mg/dl)</td>
<td>27±0.1</td>
<td>25.6±0.9</td>
<td>24±1.55</td>
</tr>
<tr>
<td>% Change</td>
<td>-5%</td>
<td>-11%</td>
<td></td>
</tr>
<tr>
<td>TC/HDL</td>
<td>1.68±0.20</td>
<td>1.6±0.15</td>
<td>1.61±0.16</td>
</tr>
<tr>
<td>% Change</td>
<td>-4.8%</td>
<td>-4.5%</td>
<td></td>
</tr>
<tr>
<td>LDL/HDL</td>
<td>0.28±0.03</td>
<td>0.23 ± 0.12</td>
<td>0.26 ± 0.03</td>
</tr>
<tr>
<td>% Change</td>
<td>-17.8%</td>
<td>-7.14%</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group. * P<0.05 in comparison to control group. HDL-C: High-density lipoprotein cholesterol, LDL-C: Low-density lipoprotein cholesterol, VLDL-C: Very low-density lipoprotein cholesterol.
Vita slim–treated rats had greater urea and creatinine concentrations than the control rats, while green tea–treated rats had lower concentrations than the control rats (Table 6).

Table (6): Kidney function enzymes of control, Vita slim and green tea groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea (mg/dl)</td>
<td>37.3±0.66</td>
<td>42.4±0.8*</td>
<td>25.8± 3.35</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>13.67%</td>
<td>-10.42%</td>
<td></td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>1.18±0.025</td>
<td>1.4±0.098*</td>
<td>0.41± 0.05 **</td>
</tr>
<tr>
<td>% Change compared to control</td>
<td>18.64%</td>
<td>-56.29%</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group.
* P<0.05, ** P<0.01 in comparison to control group using T-Test.

When compared to the levels of the control, testosterone, T3, and T4 concentrations were considerably significant elevate in the Vita slim group. In contrast to the control value, testosterone levels were lower in the green tea groups as compared with the control group (Table 7).

Table (7): Levels of testosterone, T3, T4 and leptin of control, Vita slim and green tea groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vita slim</th>
<th>Green tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testosterone (ng/dl)</td>
<td>1.03±0.08</td>
<td>1.55 ± 0.52 *</td>
<td>0.5±0.18*</td>
</tr>
<tr>
<td>% Change</td>
<td></td>
<td>50.48%</td>
<td>-51.45%</td>
</tr>
<tr>
<td>T3 (ng/dl)</td>
<td>47.9±0.6</td>
<td>53±2.1 *</td>
<td>49±23</td>
</tr>
<tr>
<td>% Change</td>
<td></td>
<td>10.6%</td>
<td>2.29%</td>
</tr>
<tr>
<td>T4 (ng/dl)</td>
<td>3.02±0.01</td>
<td>3.60 ± 0.23 **</td>
<td>2.82 ± 0.58</td>
</tr>
<tr>
<td>% Change</td>
<td></td>
<td>19.28%</td>
<td>-6.56%</td>
</tr>
<tr>
<td>Leptin (ng/dl)</td>
<td>1.90±0.35</td>
<td>1.80 ± 0.34</td>
<td>2.09 ± 0.22</td>
</tr>
<tr>
<td>% Change</td>
<td></td>
<td>-5.26%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Values are means ± SD of seven rats in each group.
* P<0.05, ** P<0.01 in comparison to control group. T3: triiodothyronine, T4: thyroxine.

**DISCUSSION**

An unhealthy relationship exists between food intake and energy expenditure caused obesity. In terms of chronic disease and disability, obesity is an important risk factor (11). Obesity increases the risk of diabetes, heart disease, hypertension, and certain cancers (12). The purpose of this study was to examine the effects of anti–obesity medications Vita slim and green tea on male albino rats’ body weight, as well as its effects on various physiological markers.

The present results denoted that there was a significant reduction in % change of body weight in rats administrated with Vita slim, which contains Garcinia cambogia, as the primary ingredient, also contains hydroxycitric acid (HCA), one of the isomers of HCA (structurally connected to citric acid), which is believed to aid in weight loss. Inhibiting citric acid lyase is the mechanism of action, which is important for the formation of fatty acids (13).

According to Kim et al. (13), Vita slim's Garcinia cambogia, is a popular weight-loss supplement. Garcinia cambogia aids in weight loss, suppresses hunger, and increases fullness. It also aids in the maintenance of a healthy weight, as it aids in the burning of body fat. In addition, green tea, which contains the highest amount of catechins, resulted in a significant loss of body weight when consumed. In vitro studies have shown that caffeinated beverages, such as red tea, have thermogenic effects and can increase fat oxidation that may aid in the reduction of body weight (fat loss) (14).

There was highly increase in liver enzyme in Vita slim–treated group. This may be due to Garcinia cambogia found in Vita slim, which revealed its hepatotoxicity effects. As the severity of liver injury increases, the liver enzyme levels elevated; our findings are consistent with those of Kaswala et al. (15).

In 2001, the first report of green tea extract hepatotoxicity was published. After report of liver damage from the dried ethanolic extract of green tea, the product Exolise was taken off from the market. Hepatotoxic effects of Camellia sinensis micronized powder were later reported in the literature. (16). Green tea infusions have also been linked to hepatotoxicity, according to recent studies (17,18). Such a side effect is unknown in terms of its frequency. In most situations, liver poisoning is more prevalent in women, with symptoms ranging from mildly elevated liver enzymes to acute liver failure.

Among our findings the globulin and albumin/globulin in Vita slim have increased significantly due to it contains Garcinia cambogia that is the most important supplement induced hepatotoxicity (19). Our study agrees with Semwal et al. (20) who stated that it has potential life-threatening side effects. In Southeast Asia, Garcinia cambogia is employed as a culinary ingredient because of its harsh and sour taste. In Garcinia cambogia, the most crucial element is HCA. Products containing hydroxycitric acid.
were recalled by the Food and Drug Administration after 23 incidents of hepatotoxicity were reported.

Green tea (GT), Camellia sinensis, has been shown to provide a wide range of health benefits, including the management of central nervous system, cardiovascular, and metabolic conditions, as well as the treatment of cancer and inflammatory disorders. Even while the term “natural” is often used as a synonym for safe, this is not always the case. GT has been linked to several negative health outcomes, according to relevant studies. Hepatotoxicity and gastrointestinal problems, especially when taken on an empty stomach, are the most common side effects (21). Hepatotoxic effects of medicines, thus, may have an impact on protein profiles given that the liver is the primary location for protein synthesis.

Vita slim and green tea reduced triglyceride levels significantly in rats. It was shown in animal experiments to reduce cholesterol levels in rats fed a cholesterol-rich diet by decreasing lipogenesis and enhancing lipase activity (22).

Roudebush et al. (23) revealed that Garcinia cambogia seeds has erythropoietic and anti-diabetic properties in rats on a high-fat diet.

In this study, the LDL and triglyceride levels were dramatically reduced after intervention with green tea. Green tea and its main ingredients catechins may reduce the absorption of lipids from the diet, which could explain why green tea lowers cholesterol (24). A single dose of green tea extract was found to dramatically reduce the absorption of lipids in research by Walkowiak et al. (25). Using 379 mg of green tea extract, Suliburska et al. (26) conducted a study on two groups of obese persons. Antioxidant levels rose significantly along with the lipid-lowering effect, according to the findings of this study.

Compared to the control group, the Vita slim group showed a substantial rise in serum creatinine due to toxic effect of chromium, which is a component of Vita slim on reduced glomerular filtration rate, which can lead to renal dysfunction and elevated levels of creatinine in the blood (27). In addition, chromium’s acute and long-term toxicity has been documented, in a study conducted by Baruthio (28) who reported toxicological effects of chromium compounds on human health, which were being defined as a result of chronic workplace poisonings caused by ingestion of dust or aerosols, or by direct contact with mucosal membranes.

Researchers found that green tea had a favorable effect on anomalies in plasma BUN and creatinine. The antioxidant and anti-inflammatory benefits of catechins, the main components of green tea extract, have been postulated (29). Glutathione peroxidase, catalase, and superoxide dismutase are just a few of the antioxidant enzymes that green tea extract contains (30). Green tea extract has been shown to be a useful dietary supplement, according to this study. Green tea extracts showed powerful antioxidant and anti-inflammatory capabilities, it lowers BUN and creatinine levels.

There were significant increases of testosterone hormone in Vita slim when compared with the control. Garcinia cambogia, the primary ingredient in Vita slim, contains the antioxidants biflavonoid and xanthone, which may explain its effects. Strong antioxidants, these substances can enhance testosterone production. Akpantah et al. (31) has found that Garcinia cambogia increases the peripheral testosterone level.

Comparing the green tea-treated groups to their respective control, this experiment indicates a drop in serum testosterone levels. Green tea epigallocatechin gallate has also been linked to a drop in testosterone levels in the blood (32). Due to the decreased activity of steroidalogenic enzymes, such as 3 β hydroxyl steroid dehydrogenase and 17 β hydroxyl steroid dehydrogenase, testosterone levels may be lower than normal (33). Kao et al. (34) reported that after drinking green tea, rats revealed reduced testosterone levels in the bloodstream. According to previous research, the polyphenols in green tea are known to decrease testosterone production in Leydig cells through cell signalling pathways, P-450 side chain breakage and the action of 17 β -hydroxyl steroid dehydrogenase, which is also known as epigallocatechin gallate (EGCG) (35).

It is proved that thyroid hormones, particularly T3, are important metabolic hormones. Energy generation is linked to the quantity of thyroid hormones in the bloodstream. Hornick et al. (36) found that FT3 was elevated in the 3000 mg/kg (−) HCA supplemented group. Increasing energy expenditure in rats has been shown to be possible using an extract of HCA from the dried Garcinia cambogia, the primary ingredient in Vita slim (37).

CONCLUSION

Findings of the current study showed that Vita slim and green tea capsules have a deleterious influence on critical biochemical and physiological markers, notably liver functions.

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Author contribution: Authors contributed equally in this study.

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