Effects of Green Tea (Sliming Herbal Tea) and Role of Dietary Practice to Reduce Obesity

Muhammad Ali¹, Shaikh Shahinur Rahman¹, Mohammad Tanvir Sarwar¹, A. Y. K. Md. Masud Rana², Md. Hafizur Rahman *¹

¹Department of Applied Nutrition and Food Technology, Islamic University, Kushtia, Bangladesh
²Institute of Food and Radiation Biology, AERE, Savar, Dhaka, Bangladesh

Muhammad Ali and Shaikh Shahinur Rahman are equal contribution to prepare this manuscript.

[Muhammad Ali = Shaikh Shahinur Rahman]

*Corresponding author

Accepted 2018-06-03

Abstract:
Obesity is a cluster of non-transmissible diseases creating a massive socioeconomic and civil health burden in both developed and developing countries. The prevalence of obesity is increased in an alarming rate and one-third of the world’s population carrying obesity. Phenolic compounds from plant sources play a great role on obesity. Green tea or herbal tea that contains four types of catechins reduced cholesterol level through the modulation of bile acid absorption and metabolism.

Objectives: the aim of this study was to monitor the effects of green tea and nutritional education about dietary habit on obese persons.

Methods: A randomized control trial (n=20) of obese persons were selected as baseline study and a sliming herbal tea (green tea) with nutritional counseling was prescribed for 12 weeks to take regularly for twice in a day. Results: This study showed a positive impact on obese individuals. After 12 weeks intervention, BMI was decreased from 30.94 to 30.57, body weight, body fat and body fat mass were reduced from 72.50 to 71.36 kg, 32.06 to 30.18% and 27.38 to 25.52 kg respectively. Moreover, a dietary practice of high protein diet with low calorie and low fat diet was developed through nutrition counseling at the baseline study.

Conclusion: Obesity management is a combined process. So, green tea with planned diet might be a fruitful effort to reduce body weight, body fat and overall BMI of an obese person.

Key words: Obesity, green tea, nutrition education.

Introduction:
Overweight and obesity is a burning issue for public health. Currently obesity considered as a serious public health concern which influence on health, economy and quality of life. It is a global epidemic and prevalence, increasing rapidly all over the world (Cutri et al., 2011). The prevalence of obesity has more than doubled over the past 35 years and about 2.1 billion in 2013 which is one-third of the world’s population (Jensen et al, 2016). Obesity not only limited to developed country but also over 115 million people of developing countries suffer from obesity related problem like diabetes, hypertension,
cardiovascular disease, osteoarthritis, respiratory problems and so on. According to WHO (2010), the prevalence of general obesity in people over 15 years was 11% and central obesity was 14% in Bangladesh. While Bangladesh Demographic and Health Survey (BDHS) (2011) reported 17% overweight or obesity in adult Bangladeshi population (Bhowmik et al., 2015). Obesity was developed by interaction of many factors like genetics, metabolic, behavioral and environmental influences. Enough energy consumption and less expenditure or a combination of both has promoted positive energy balance and increased overweight or obesity in a society (Rolfes et al., 2009). Till date, there are very few natural medications available in the market to treat obesity due to have their fewer side effects and less expensive as compared with synthetic drugs. Therefore, many herbs, herbal medicines, healthy foods and nutraceuticals are increased in popularity even in both developed and developing countries. The precious medicinal properties of different plants are due to presence of several constituents i.e. saponins, tannins, alkaloids, phenols, flavonoids, terpenoids etc (Tiwari and Singh, 2004). The phenolic compounds plays a great role on obesity without restricting caloric intake and change in life style (Arulmozhi et al., 2010). But the amount of polyphenols in our daily food consumption is very low. Hence, dietary supplements rich in polyphenols are recommended for achieving beneficial results. Among various beverages, tea is the most popular and consumed beverages all over the world. Tea extract from Camellia sinensis plant and using as green, black and Oolong tea in different parts of the world. Among these, green tea consumption has the most significant beneficial effects on human health (Heindel et al., 2015). There are four types of catechins mainly found in green tea like epicatechin (EC), epigallocatechin (EG), epicatechin-3-gallate (ECG) and epigallocatechin gallate (EGCG) (Chacko et al., 2010). EGCG only found in tea not in other plants. A cup of brewed green tea (2g of leaves steeped in 200ml of water) consists of 240-320 mg of catechins with 30-50% EGCG (Grove and Lambert, 2010). EGCG reduces cholesterol level through the modulation of bile acid absorption and metabolism. GTC with EGCG not fully absorbed from intestine that could be lower cholesterol level by directly interact with intestinal epithelial bile acid (Alexopoulos et al., 2008). Regular consumption of green tea may help to reduce body waist, particularly body fat through increasing post prandial thermo genesis and fat oxidation (Heindel et al., 2015). The effect of tea on obesity and related pathologies including hypercholesterolemia and fatty liver disease were examined by many animal studies but in human study this is rare. Thus the aim of this study was to find out the effect of green tea on obese individuals. 

Mechanism of tea polyphenols (Boschmann and Thielecke, 2007)
Muhammad Ali et al. Effects of Green Tea (Sliming Herbal Tea) and Role of Dietary Practice to Reduce Obesity

Methods and Materials:

Study design:
A randomized control trial of nutrition counseling and supplementary giving sliming herb (green tea) was designed from 1st December, 2017 to 24th February, 2018 to analyze the impact of this herb on obese persons.

Subjects:
At the baseline of the study exactly the same number (n=25) of obese persons were randomly assigned to a control and an intervention group from south west areas of Bangladesh. Among them five (05) participants were disqualified due to their irregular intake of supplied green tea. Thus, twenty obese persons (aged between 25 and 50) were selected in this study and they had not any medical condition and not undergone a natural or surgical menopause. All volunteers did not dieting last three months and lead steady life or no physical activity for at least three months prior to enrolment. As a part of screening process, all volunteers have been briefly interviewed, took three days food or activity diary and analyzed by diet 6 plan software and send to every percipients prior to the first consultation all volunteers received a welcome pack (sliming herb tea). Furthermore, any supplements, vitamins or minerals that had known effect on the components in the weight management pack were discontinued before the first visit, for avoiding any drug-nutrient-herbal interaction. All participants have been signed a consent form.

Experimental design:
In the primary consultation (day-1) subjects were introduced about the nutritional program supplements and diet in addition to exercise regime and all baseline anthropometric measurements were taken. All participants (n=20) were asked to follow recommendations for 12 weeks. After that, they had received slim herbal tea and were instructed to drink on time, twice in a day after breakfast and before sleep at night. All participants received nutritional counseling in oral and written form. After twelve weeks (84 days) all subjects were advised for anthropometric measurements and a post-trial questionnaire covering experience of this study.

Supplements:
A sliming herbal tea (green tea) manufactured by GERMAN HERB (THAI) & CO. was used in this study. Sliming Herb packs were distributed to the volunteers at the base line and the initial consultation for 12 weeks.

Diet:
Core principles of the dietary program fixed up by using visceral aids. Three days lifestyle dietary format has been provided to the all participants at the base line before drinking sliming herb and details advised were given with using example of everyday products and instructed to take measurements by common household measuring utensils in order for all volunteers to precisely complete the 3 days food diary. During completing the 3 days food diary, all volunteers were requested or advised to write down the normal dietary habits of two (02) working days and a weekend day. After receiving the diary, the results were reviewed during each consultation to ensure their accuracy. All participants were instructed to take at least 1000 kcal/day in addition with all other dietary recommendations. Macronutrient content of the volunteers was approximately 58% carbohydrates, 17% protein, and 25% fat. The participants were requested to withdraw from, or minimize, the ingestion of caffeine-containing foods 24 h before and throughout the experiment.

Statistical analysis:
Data was analyzed by using statistical package for social science (SPSS) software and was presented the values as means ± standard deviation (SD). All calculations and analysis were produced at the two tailed level 0.05 α-level and paired sample t-test was done to look for the significant difference on categorical variables between the intervention and baseline group. Basic anthropometric measurement, height and weight were measured using standard anthropometric techniques.

Results:
Table-1 showed physical changes of body weight and composition at baseline and after 12 weeks intervention phase. significant changes were observed for BMI (p<0.001), body weight, percent body fat and body fat mass (p<0.05) in this dietary supplementary study from baseline to after 12 weeks.
Muhammad Ali et al. Effects of Green Tea (Sliming Herbal Tea) and Role of Dietary Practice to Reduce Obesity

**Table-1: Physical changes of obese persons at baseline and intervention period (after 12 weeks)**

<table>
<thead>
<tr>
<th>Study Period</th>
<th>Respondents (n=20) (Mean ± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (kg/m²)</td>
<td>Baseline 30.94±3.72</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Intervention 30.57±2.78</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -0.37</td>
<td></td>
</tr>
<tr>
<td>BW (kg)</td>
<td>Baseline 72.50±9.85</td>
<td>0.056</td>
</tr>
<tr>
<td></td>
<td>Intervention 71.36±7.85</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -1.14</td>
<td></td>
</tr>
<tr>
<td>BF (%)</td>
<td>Baseline 32.06±10.46</td>
<td>0.042</td>
</tr>
<tr>
<td></td>
<td>Intervention 30.18±9.87</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -5.81%</td>
<td></td>
</tr>
<tr>
<td>BFM (kg)</td>
<td>Baseline 27.38±13.77</td>
<td>0.048</td>
</tr>
<tr>
<td></td>
<td>Intervention 25.52±12.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -1.84</td>
<td></td>
</tr>
</tbody>
</table>

BMI= body mass index; BW= body weight; BF=body fat; BFM=body fat mass; P-values for within-group change from baseline compared by paired samples t-test.

**Table-2: Changes of dietary habit after nutrition education**

<table>
<thead>
<tr>
<th>Daily Measures</th>
<th>Study Period</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (Kcal)</td>
<td>Baseline 1247.58±271.8</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Intervention 1093±240.23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -154</td>
<td></td>
</tr>
<tr>
<td>Fat (%)</td>
<td>Baseline 25.26±5.73</td>
<td>0.042</td>
</tr>
<tr>
<td></td>
<td>Intervention 22.65±3.44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -0.21</td>
<td></td>
</tr>
<tr>
<td>Carbohydrates (%)</td>
<td>Baseline 58.08±6.02</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>Intervention 56.52±4.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change -1.56%</td>
<td></td>
</tr>
<tr>
<td>Protein (%)</td>
<td>Baseline 15.02±3.05</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Intervention 16.40±2.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change 1.02%</td>
<td></td>
</tr>
</tbody>
</table>

BMI= body mass index; BW= body weight; BF=body fat; BFM=body fat mass; P-values for within-group change from baseline compared by paired samples t-test.

Table-1 indicates that after 12 weeks of intervention, BMI was changed from 30.94 to 30.57 and the average change was -0.37kg/m², while the average body weight changes were from 72.5 to 71.36 kg and average weight loss from baseline was 1.14 kg. Body Fat also reduced after 12 weeks intervention (32.06 to 30.18) and percentage changes were 5.81%. However, body fat mass also decreased from 27.38 to 25.5 kg and average change of body fat mass was 6.74 kg.

Table-2 also depicted the dietary food habit changes after nutrition education among obese persons from baseline study. This table showed that the total energy consumption at the baseline study was 1247.58 kcal/day but after intervention it was reduced to 1093kcal/day. While carbohydrate and fatty food consumption were reduced from 58.08 to 56.52% and 25.26 to 23.65% respectively. On the other hand, daily protein intake was increased from 15.02% to 16.40% after 12 weeks intervention period. This table also showed that nutrition education played a significant role on obese individuals (table-2).

**Discussion:**

The outcome of this research project was to determine the effect of structured weight loss programme with nutritional supplements (Sliming herb), counseling and physical activity. Supplements (Sliming herb) have been considered as an important thermogenic products or compounds. Though, green tea supplement has not been presented consistent to reduce body weight with animal models. A study in humans, which was open label 3 months in moderately obese patients that demonstrated green tea extract (GTE) increases energy expenditure and fat oxidation, thus resulting reduce body weight by 4.6% (Grove and Lambert, 2010). In this study, has been shown to attenuate body weight only 1.57% which was significant but project length was only 12 weeks compare to other published in humans study. It has been examined by the study that the hypothesis of supplements (slimming herb), with nutritional counseling was effective. Twenty (20) participants were open label randomized trial in one group. The principal finding from this project is- consumption of sliming herb (green tea) with nutritional counseling that engages structured lifestyle and activity advice has given benefit to reduce body weight, improved body fat mass, body fat percentage and BMI. There are so many studies about nutritional counseling that help to prevent weight gain and obesity. Chan et al. (2006) showed that EGCG (the main catechine in green tea) stimulates natural cell death, prevent adipogenesis and intracellular triglyceride (TG)

International Journal of Contemporary Research and Review, Vol. 9, Issue. 06, Page no: FS 20181-20186
DOI: https://doi.org/10.15520/ijcrr/2018/9/06/519
Page | 20184
accrual in 3T3-L1 adipocytes. This study also confirmed a moderate loss of body weight, BMI, body fat and body fat percentage by using sliming herb (green tea) with nutritional counseling (Table-1). Moreover, significant changes found in percentage body fat and body fat mass compare to body weight and BMI. It is remarkable that most of the subjects did not gain weight except three (03) but the reason is unknown. Lifestyle intervention plays a major role to reduce weight. For reducing weight significantly need to lead discipline life that means consume nutritionally balanced food or less fat containing food with physical exercise. There are so many studies exhibit about lifestyle intervention which guided on the fat, carbohydrates and protein reduction in order to lose weight. Binge eating disorder (BED) is interrelated with overweight and obesity. Lifestyle intervention effectively attenuates weight, maintain weight loss and manage overweight and obesity related pathologies like BED which are collective treatment options (food habit, physical and cognitive behavior etc.) (Castelenuovo et. al., 2011). Overweight and obesity was developed after consuming more energy rather than expenditure. Increased number of fat cells and their lipid developed obesity via the mutagenesis and differentiation process (Kim and Sakamoto, 2011). Ello-Martin et al. (2007) conducted a trial which showed that reducing dietary energy density especially more fruits and vegetables consume with less fat significantly reduce body weight. This study also indicated that low energy diet consume through the nutritional counseling brings focus, motivation and supporting the commitment to the program. Nutritional counseling and motivation in this project reduce significant energy intake from baseline (1247.58 to 1093 kcal). Dietary compliance was good based on the keeping of the diet records at baseline and after 12 weeks. However, data showed moderate compliance objecting to get recommended level of carbohydrates, fat and protein (55%, 24%, and 16% respectively). Greater amount of protein consumption has been reported to lose weight significantly through protecting fat free mass and resting energy loss more than a higher carbohydrate diets. High protein diet is beneficial to promote greater improvement of several health markers especially the populations who are at risk of cardiovascular disease (Morgans-Courtney et al., 2011). Through nutritional counseling and motivation, volunteers were consumed more protein compare to baseline that could be promoted weight reduction and average protein consume increased about 1.02% (Table-2).

Conclusion:
To conclude this study, nutritional education and supplementary taking sliming herb (green tea) may play a significant role for reducing body weight, body fat and overall BMI of an obese person.

Acknowledgement:
We would like to thanks to all participants who took part in this study as a volunteer and co-operate with us. This research was supported by the Faculty of Science and Technology, Islamic University, Kushtia, Bangladesh. The authors are thankful to Professor, Dr. Shakh Mohammad Abdur Rouf for valuable suggestions and cooperation during research work.

Conflict of Interest:
The authors declare that there were no conflicts of interest regarding the publication of this manuscript.

References:


