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Effect of "BEAUTYCOFFEE" on Body Weight A Pilot Study in Patients with Obesity

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Abstract

Background and Aims: Obesity and overweight are associated with a wide spectrum of morbid conditions, which contribute to high prevalence of disability and mortality worldwide. These conditions include the metabolic syndrome, cardio--vascular and cerebro-vascular events, and fatty liver disease with the possible deterioration to liver fibrosis, cirrhosis and malignancy. Despite the wide variety of treatment options available, which include lifestyle modifications and medical and surgical interventions, obesity is still considered a worldwide pandemic, necessitating the search for additional treatment options. As caffeine exerts weight-reducing properties, we here studied the effect of Beautycoffee, a dietary supplement composed of black and green coffee arabica, together with herbal compounds, believed to be effective towards decreasing body weight.

Methods: Twenty-seven otherwise healthy 18-years-old and older subjects were enrolled in the study (Ethics number RMC 204-23). Subjects consumed two drinks of Beatycoffee daily for one month, and we studied the effect on body weight, body mass index, and chest, waist and thigh circumferences.

Results: Consuming Beautycoffee for one month resulted in significant reduction in body weight (4.6%), body mass index (4.3%), and chest, waist and thigh circumferences (by 2.5%, 2.8%, and 2.3%, respectively). No adverse effects were reported.

Conclusions: Beautycoffee is a safe and effective dietary supplement that can be incorporated in treating the obesity pandemic.

Keywords: Obesity; Overweight; Beautycoffee; Weight loss

Background

Obesity is a health pandemic increasing in prevalence with time, affecting the vast majority of nations all over the world [1]. According to the world health organization, obesity is defined as having a body mass index (BMI) of ≥30 kg/m^2, calculated as the body weight (in kilograms) divided by the square of height (in meters). Normal BMI is 18-25 kg/m^2, while BMI of 25-29.9 kg/m^2 is defined as overweight. Obesity itself is classified into 3 categories- class I (BMI 30-34.9 kg/m^2), class II (BMI 35-39.9 kg/m^2), and class III (BMI≥40 kg/m2). Nevertheless, individual differences have been described regarding the percent of body fat in different subjects having the same BMI, differences that may be attributed to sex, ethnicity, and age [2]. Most of the morbidity associated with obesity is directly related to the excess of fat accumulated in the abdomen- abdominal obesity [3], which reflects the deposition of fat in the subcutaneous tissue, and is associated with diabetes mellitus, arterial hypertension, cardiac diseases, non-alcoholic fatty liver disease, kidney disorders, cancer and other health problems. It is evaluated by the measurement of waist circumference, which is considered abnormal if greater than 102 cm for men and 88 cm for women. As abdominal obesity is considered an independent risk factor for disease, treating abdominal obesity could be of favorable effect of health and result in reduced obesity-related morbidity.

Since the year 1980, it is believed that the prevalence of obesity has been doubled worldwide, causing almost one third of the global population to be either overweight or obese. A chinese cohort with 22 years followup including 12543 participants revealed an increased age-adjusted prevalence of obesity by 6.5 fold, from 2.15% to 13.99% [4-5]. The direct mechanism of obesity is related to the imbalance between the amount of calories consumed and those expended by the individual, and is affected by several variables, including regulation of caloric utilization (metabolism), appetite, and physical activity. In their study on 3000 youngs with 13 years follow-up in USA, Duffey et al. demonstrated that high consumption of fast food (with high content of energy) was significantly more associated with higher weight gain (average of 6 kg) and higher waist circumference, together with higher incidence of obesity-related morbidity, as compared to those who consumed lower amounts of fast food [6].

Additional factors are implicated in the development of obesity, such as genetic factors that can result in several mechanisms which lead to obesity, like increased caloric intake, increased hunger, reduced satiety, reduced control of overeating, and increased tendency for storing body fat [7-9]. Also the composition of gut microbiome is implicated in obesity, as microflora may alter host metabolism. A support for this notion can be found in the study of Bäckhed et al., in which germ-free mice (lacking gut microflora) expressed 42% less total body fat compared to mice with normal gut microflora, even when they consumed 29% more daily food [10]. Also neuroendocrine alterations may be associated with obesity, like the cases of Prader-Willi syndrome which results from hypothalamic dysfunction [11], and Polycystic ovary syndrome, which may also lead to increased body fat [12]. As such, treatment of obesity relies on a multi-factorial approach, including:

1. Lifestyle modification, which involves dietary changes, physical activity, and behavioral therapy.

2. Pharmacotherapy. Treatment with obesity-reducing medications is recommended for subjects with BMI≥30 kg/m^2, or those with BMI≥27 kg/m^2 accompanied with obesity-related co-morbidity, who fail to loose body weight following lifestyle modification alone [13]. Chemical compounds for treating obesity include Natrexone-Bupropion, Orlistat, Liraglutide and others, while the use of these compounds may be limited in a large proportion of patients due to intolerability or ineffectiveness.

3. Several compounds derived from plants that may induce weight loss where identified, and include Celastraceae, Zingiberaceae, Theaceae, Megnoliaceae, and Solanaceae [14]. Such compounds were adopted by traditional Chinese medicine to treat obesity, and have been described to be involved in regulating fat metabolism, enhancing hormonal activity, and regulation of intestinal microflora composition [15].

4. Surgical treatment for obesity is increasing in use in the last years, and is indicated for those with BMI≥40 kg/m^2, or those with BMI≥35 kg/m^2 accompanied with obesity-related co-morbidities, who fail to lose weight by lifestyle and dietary interventions [13].

In spite of all the available treatment modalities, the goal of reversing or reducing the obesity pandemic is far from being achieved, and many of those successful cases which loose weight may fail to maintain the weight reduction. As such, seeking additional interventions for weight loss is absolutely justified, especially those utilizing natural compounds that may have less side effects than artificial ones.

Beautycoffee, a natural coffee powder produced from black and green coffee arabica (45% chlorogenic acid), together with herbal products known to have effects towards weight loss, including Garcinia Cambogia, Gymnema sylvestre extract, Chromium (as Chromium Picolinate), and Laminaria Japonica extract. As Beautycoffee is a coffee drink enriched with herbal products described to have an effect on losing weight, our aim was to study the effect of Beautycoffee on body weight in subjects with obesity/overweight.

Methods

Study Population

Twenty seven subjects were enrolled in the study. Subjects were at least 18 years-old, signed an informed consent, and had obesity-defined as BMI≥30, or overweight (BMI of 28-30), are not on any obesity-decreasing interventions, and are not after or scheduled for a bariatric surgery. We enrolled healthy subjects that had no chronic illnesses nor needed any medical treatment on regular basis. The rationale behind participant recruitment was to hold a pilot study in which we choosed healthy subjects, as such a study could be the basis for future studies which may include also subjects with additional co-morbidities. Beautycoffee was supplied by Herbal Remedies Laboratory Ltd., Kidmat Hagalilee, Israel. Subjects underwent measurement of their BMI, chest, waist, and thigh circumferences, and blood tests for thyroid function, complete blood count, lipid profile, and renal and liver function, and were enrolled in case they had no abnormalities. Subjects were instructed to consume 2 drinks per day, each of 2.5 gram of beatycoffee powder, for 30 days, after which repeated weight, BMI and chest, waist and thigh circumferences were measured. Each drink is supposed to include 6.25 mg Gracinia Cambrogia, 1.25 mg Gymnema sylvestre extract, 0.005 mg Chromium (as Chromium Picolinate), 0.125 mg Extract Green coffee 45% chlorogenic acid, 0.625 mg Laminaria Japonica extract, and 52.7 mg Black coffee Arabica, equal to 54.4 mg caffeine.

The investigational Product (IP) Beatycoffee is composed from the following ingredients (per 100 gr product):

1. Garcinia Cambogia- 250 mg.

2. Gymnema sylvestre extract- 50 mg.

3. Chromium (as Chromium Picolinate)- 0.2 mg.

4. Extract Green coffee 45% chlorogenic acid- 5 mg.

5. Laminaria Japonica extract- 25 mg.

6. Black coffee Arabica- 2107.5 mg.

For the chemical properties and effect on health of each compound see references [10,11] ,[16-21]. End points included total difference in body weight and BMI between the beginning and the end of the trial, and percent weight reduction at the end of the study. Circumferences of chest, waist and thighs were also compared at the end of the study to the baseline values.

Ethical issues: The study was observed and confirmed by the local ethics committee of Rambam Health Care Campus, Haifa, Israel (approval number 0204/23).

Statistical Methods

Statistical analyses included the use of Student's t-test, when comparing the means of two groups. ANOVA was used when more than two groups were compared. Paired-samples T-test using SPSS version 27 were used to compare values of baseline with end of study. Results are given as mean ± SEM. $p<0.05$ is considered statistically significant. Sample size was determined using "open-epi" with 95% confidence interval and 80% power. A change in BMI of ≥1.4 kg/m^2 was considered significant.

Results

Twenty-seven subjects were enrolled into the study, of which twenty-five otherwise healthy female subjects, with obesity or overweight [having BMI≥30 (n=20) or 28-30 kg/m2 (n=5), respectively]. Two subjects were excluded, one for hyperthyroidism and one for hypothyroidism. All eligible subjects had normal kidney, liver and thyroid function tests, and had consumed the IP according to the protocol instructions. No adverse events were reported by any of the subjects. Subjects had average weight of 83±10 kg (range 68-109 kg), and average BMI of 32.7±4.3 kg/m^2 (range 28-39.4 kg/m^2). Average chest circumference was 103.8±7.2 cm, waist circumference was 98.1±9.2 cm, and thigh circumference was 115.2±10.9 cm. For comparing the body weight and BMI following one month of consumption of Beautycoffee to the baseline values, we applied Paired-samples T-test using SPSS version 27. Body weight decreased on average by 3.78 kg [4.6%, 95%CI=0.9542-1.8893, $p<0.001$, (Figure 1)], and BMI decreased by 1.42 kg/m^2 [4.3%, 95%CI=0.954-1.889, $p<0.001$, (Figure 1)].

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
Pair 1	Weight (kg) - weight_2 (kg)	3.72	2.1894	0.4379	2.8163	4.6237	8.496	24	<.001
Pair 2	BMI (Kg/m2) - BMI2 (Kg/m2)	1.408	1.0364	0.2073	0.9802	1.8358	6.793	24	<.001
Pair 3	Waist (cm) - Waist_2 (cm)	2.47826	3.21742	0.67088	1.08694	3.86958	3.694	22	-.001
Pair 4	Thigh (cm) - Thigh_2 (cm)	2.69565	2.14126	0.44648	1.7697	3.6216	6.038	22	<.001

One-Sample Test						
				Test Value = 0	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Thigh (cm)	49.555	24	<.001	115.17391	110.3539	119.994
Thigh_2 (cm)	54.044	24	<.001	112.47826	108.1621	116.7945
Weight (kg)	37.269	24	<.001	82.9565	78.34	87.573
weight_2 (kg)	36.728	24	<.001	79.1739	74.703	83.644
BMI (Kg/m2)	35.886	24	<.001	32.6696	30.782	34.558
BMI2 (Kg/m2)	36.912	24	<.001	31.2478	29.492	33.003
Waist (cm)	50.226	24	<.001	98.08696	94.0369	102.1371
Waist_2 (cm)	56.804	24	<.001	95.6087	92.1181	99.0993

Figure 1: Paired-samples t-test for comparison of weight and BMI at baseline and following one month of consumption of Beautycoffee.

The secrease in BMI was consistent in all the aprticipants except for one subject (Figure 2).

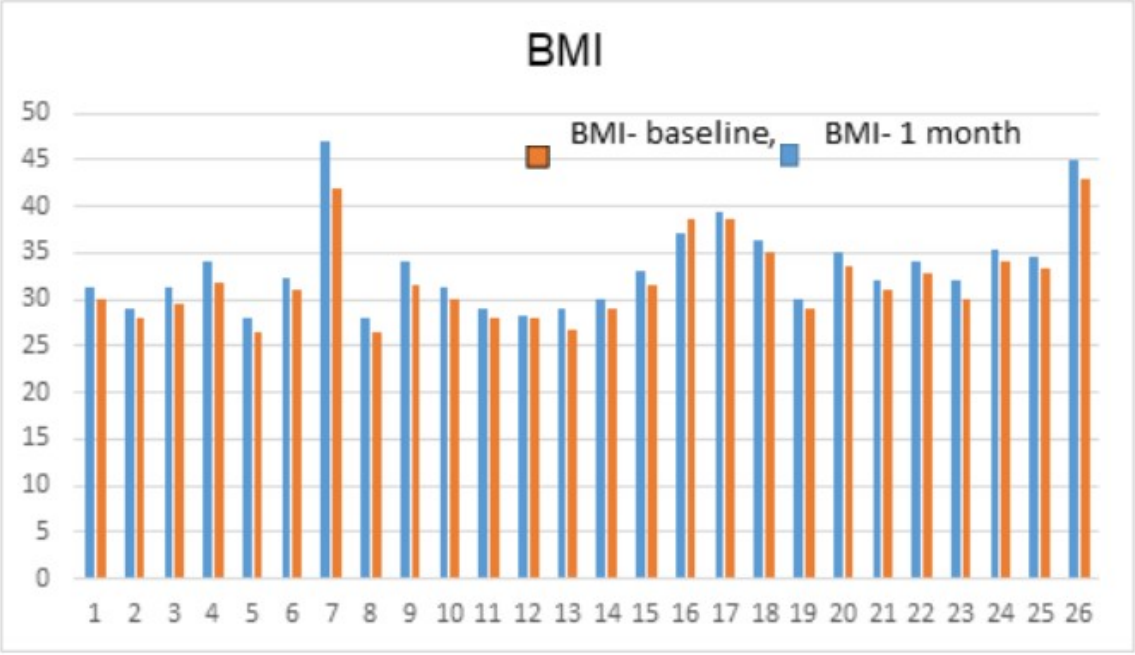

Figure 2: The decrease in BMI per subject, from baseline (blue columns) to the BMI following one month of consuming Beautycoffee (orange columns).

In addition, chest, waist and thigh circumferences were decreased by 2.5% ($p<0.001$), 2.8% ($p=0.001$), and 2.3% ($p<0.001$), respectively. Average blood pressure at the end of the study was comparable to the baseline values ($p=0.62$). Patient characteristics and results are shown in table 1.

Table 1: Characteristics of patients enrolled in the study (n=25).

	Baseline±SD	30 days	Difference	p-value
Age (years)	38.1	___	___	___
Weight (Kg)	83.0±10.4	79.2±10.1	3.78 (4.6%)	<0.001
Height (cm)	159.5±6.9	___	___	___
BMI (kg/m^2)	32.7±4.3	31.3±	1.42 (4.3%)	<0.001
Chest circumference (cm)	103.8±7.2	101.9±6.8	2.48 (2.5%)	0.001
Waist circumference (cm)	98.1±9.2	95.6±7.9	2.7 (2.8%)	<0.001
Thigh circumference (cm)	115.2±10.9	112.5±9.8	2.7 (2.3%)	<0.001
Systolic blood pressure	119.6±9.5	118±7.6	1.4 (1.2%)	0.62
Diastolic blood pressure	69.5±8	67±7.1	1.2 (3.2%)	0.36

Discussion

As obesity and overweight are multi-factorial conditions that are influenced by genetic predisposition, gut microbium, metabolism rate, and dietary and physical habits, successful treatment for these conditions should rely on a multi-disciplinary approach. Medical and surgical interventions are widely in use for treating weight excess, but the obesity pandemic is far from being appropriately controlled, thus additional approaches with possible positive impact on weight loss are highly needed. Nutrition and dietary habits, as well as physical activity, are important cornerstones in treating obesity and overweight. Consuming low-calorie diet is important in preventing or attenuating weight gain, but is absolutely not sufficient in the majority of the cases. Of an equal importance is the adoption of a calorie-waisting lifestyle, which could be achieved by excess physical activity or by consuming agents that may cause increased metabolism. Coffee is the most commonly consumed psychoactive substance in the world. Several metabolically active compounds with weight-decreasing properties exist in the coffee drink, of which caffeine is the most potent substance. By increasing levels of dopamine and epinephrine, caffeine increases metabolic rate by 11-12% [22,23]. Thus, caffeine is widely included in commercial fat-burning dietary supplements. Caffeine is also known to help mobilizing fats from fat tissues by accelerating lipolysis [24], which helps reducing weight, especially when accompanied with a negative energy balance. It also increases rest metabolic rate (RMR) by 3–11%, with larger doses having a greater effect [25,26], mainly by an increase in fat burning [27]. Coffee is also one of the single largest sources of antioxidants in the western diet. Additional biologically active substances that affect metabolism are also found in coffee beans and include Theobromine- the main stimulant in cocoa; also found in smaller amounts in coffee [28], Theophylline- A stimulant substance found in both cocoa and coffee; has been in clinical use for treating asthma [29], and Chlorogenic acid- a main biologically active compounds in coffee; believed to help in slowing the absorption of carbohydrates in the intestine [30].

In our study, subjects consumed Beautycoffee for one month, a coffee drink enriched with herbal compounds known to attenuate weight gain. Consumption of beautycoffee resulted in significant reduction in body weight and BMI [by 4.6% ($p<0.001$) and 4.3% ($p<0.001$), respectively]. Although the decreases are modest, they could have an important additive value in reducing body weight, especially when beautycoffee is incorporated with additional treating modalities- such as dietary regimens and adopting weight-reducing physical activity on regular basis, or when used in conjunction with other available medical interventions for weight loss.

Limitations

We enrolled small number of participants, which are all healthy, for only one month. Our enrollment plan depended on the sample size calculation applied. It would be wise to perform a similar research in subjects with additional morbidities and for a longer

time period.

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