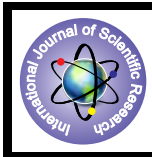


Honey in warm water: An ideal prescription for weight loss



Medical Science

KEYWORDS : Honey prescription weight loss

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ABSTRACT

Considering high incidence, risk factors and complications of obesity, adverse drug reactions and complicated surgical interventions for obesity management, the present study was conducted to evaluate the health benefits of honey in warm water for suppressing appetite in obese individuals. 18 obese subjects were voluntarily participated in the present study and they were advised to consume one table spoonful of honey in a glass of water daily 1-2 hours after dinner for one month. Their appetite, weight and Body Mass Index (BMI) before and one month after intervention were analysed by 'Z' test of proportion and paired 't' test. It was observed that there was significant reduction in appetite and weight and subsequently fall in BMI only one month of intervention. Hence it was concluded that merely honey consumption in warm water can suppress appetite and subsequently reduce weight.

Introduction: - Obesity, a metabolic disorder, is an important predisposing factor for heart diseases, ischemic stroke, type-II diabetes mellitus, obstructive sleep apnoea, gall stones and osteoarthritis. Its causes include genetic, increased energy intake, sedentary lifestyle and endocrinal disorders. Management involves dietary habits, physical activity, medications and surgical interventions. Currently available drugs have evidence for long term use with adverse side effects. Bariatric surgery for severe obesity is complicated and often requires reoperations¹⁹. Modifications in dietary habits and physical exercise remain the mainstay for management of obesity^{20,31}.

The health benefits documented and attributed to honey include cardio protective, hepatoprotective, hypoglycaemic, antioxidant, antibacterial, anti-fungal, anti-viral, anti-inflammatory and antitumor ^{1, 5, 9,10,11,12,13,20,21, 24,26, 32, 33} activities. Many animal studies but very few human studies were performed to evaluate the effect of honey on regulation of satiety, weight and obesity reduction^{6, 10, 22, 28}. The present study was designed to reduce the appetite and subsequently the weight in obese individuals by prescribing non-pharmacological agent as honey in warm water.

Aims and Objectives: - The present study aimed to reduce the appetite and subsequently the weight in 1 month by prescribing a tablespoon of honey in a glass of warm water 1 -2 hrs after dinner in obese individuals.

Materials and Methods: -

18 obese persons attending evening OPD for general illness were voluntarily participated in the study. Their particulars including name, age, occupation, address, present history and relevant past history were entered in case sheet cum informed consent form. Personal history including their appetite, detailed food and water drinking habits, bowel habits, sleep, addiction and medication was noted. Relevant family history of obesity was also noted.

Inclusion criteria: - Obese persons of both gender with age ranging between 40-60 years.

Exclusion criteria: -Thin built, anorexic, obese persons on any anti-obesity drugs and diabetic patients.

Volunteered subjects were educated about the health hazards of obesity, anti-obesity drugs and surgical complications. They were also made aware about benefits of honey for reduction in appetite in a comprehensive language. They were suggested and encouraged to consume 1 table-spoon of honey in a glass of warm water 1-2 hrs after dinner regularly for one month.

Subject's weight was measured in kilogram (Kg) by using Krupp's weighing machine without any footwear and heavy cloths. The height was obtained in cm. by measuring scale inscribed on a wall with the subject standing erect against the wall with bare feet on a flat floor. BMI was calculated by dividing weight in Kg with height in meter square and expressed in Kg/m².

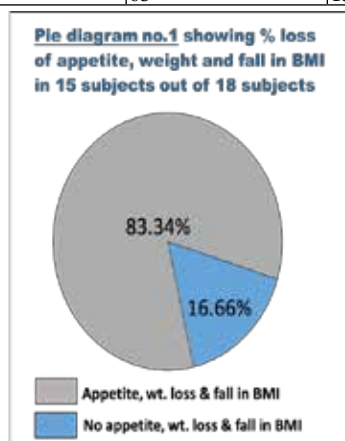
After 1 month of intervention their appetite, weight and BMI were noted followed by analysis with paired 't' test for weight loss & BMI and Z test of proportion for assessing appetite loss.

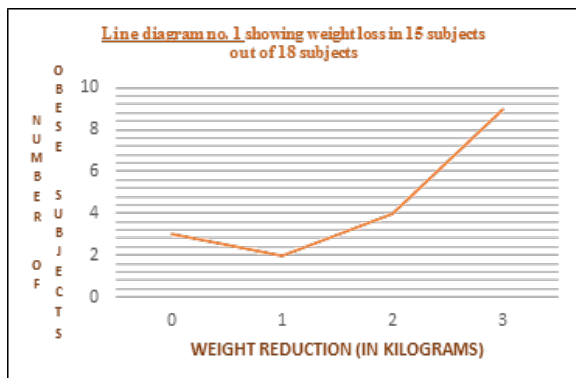
Observations and Results: -

Statistical analysis revealed appetite suppression in 15 subjects in one month of intervention with Z value of 3.6 which was statistically significant (as shown in Pie diagram 1). There was 3kg, 2kg and 1kg weight reduction in 9,4 and 2 subjects respectively with paired 't' test value of 7.51 at 17 degrees of freedom which was highly significant as shown in Table 1 and the trend was predicted by line graph no.1. BMI was also decreased correspondingly with the weight which was also highly statistically significant (as shown in Pie diagram 1).

Table no.1 Showing appetite, weight loss and BMI (Body mass index) in subjects after 1 month of honey and warm water consumption. (no. of subjects {N} =18)

Parameters	No. of subjects (N = 18)			
Loss of Weight	0kg.	1kg.	2kg.	3kg.
	03	09	04	02
Appetite	No loss of Appetite		loss of appetite	
	03		15	
BMI in Kg/m ²	No change		Decreased	
	03		15	





Discussion: - Honey is composed primarily of fructose and glucose but also fructo-oligosaccharides, amino acids, flavonoids, phenolic acids, ascorbic acid, tocopherols and many enzymes such as catalase, superoxide dismutase, etc.^{2,7,18,23,25,29}.

Evidence suggests that fructose consumption prolongs gastric emptying, slows down the rate of intestinal absorption^{15,22}. A recent study also corroborates the suppressant effect of fructose on food intake^{23,27,28}. Slow absorption of fructose in the intestine might elongate contact duration and interaction between fructose and intestinal receptors that play a key role in satiety³. This might allow more macronutrients (including carbohydrates) to be passed into colon limiting their intestinal absorption. Oligosaccharides such as palatinose also delay digestion and intestinal absorption of glucose resulting in reduced glycemia^{15,22}.

A recent study reported that low-moderate fructose diet (together with natural fruit) resulted in weight loss in obese subjects and these subjects on the moderate-fructose diet lost more weight than those on the low-fructose diet^{26,28}. However, some studies have found that high fructose consumption was associated with increased weight gain, hypertriglyceridemia, reduced insulin sensitivity and increased visceral adiposity^{6,30}. These detrimental effects of fructose in the liver are not associated with low or moderate doses of fructose but with high doses of fructose consumption^{8,30}.

Other honey antioxidants reduce weight and ameliorate the abnormalities of lipids. Similarly, reduced weight gain and anti-lipidemic effect has been demonstrated for honey in rats, diabetic human subjects or no change in body weight in obese subjects^{4,15,28,32}.

In healthy subjects as well as in patients with hyperlipidemia, honey consumption reduced TC, LDL cholesterol and increased HDL cholesterol^{1,4}. Similarly, honey supplementation in type 2 diabetic for 8 weeks significantly reduced TG, TC, LDL cholesterol, LDL/HDL ratio and increased HDL cholesterol compared with baseline data^{1,4,5}.

Findings from recent studies suggest that honey might reduce weight gain via modulation of appetite-regulating hormones such as leptin, ghrelin and peptide YY^{26,28}. Fructose and oligosaccharides might also contribute to reduced body weight and food intake in honey-fed rats^{2,8,26}. The antioxidant effect of honey might also contribute to reduced weight gain^{10,12,17,29}. Warm water hastens gastric emptying and thus may decrease intestinal absorption of nutrients³⁴.

Conclusion: - The present study concluded that honey in warm water can suppress the appetite and subsequently reduce the weight significantly in obese individual. The pre-

sent study should have included other parameters such as body fat analysis, lipid profile, serum levels of leptin, insulin, cortisol and gut peptides (ghrelin, peptide YY (PYY) & cholecystokinin).

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