COMPARISON OF BODY WEIGHT IN STUDENTS WHO REGULARLY TAKE TEA WITH THOSE STUDENTS WHO DO NOT

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ABSTRACT

Objective: To evaluate the association of body weight with the tea consumption with or without addition of sugar.

Material and Methods: The students of KGMC were divided into two main groups. The students who were not taking tea were included in group NT. The group T students were taking tea (with or without sugar) which were further subdivided into two subgroups, TNS consisting of those students who were taking tea without sugar and TS consisting of students consuming tea with sugar.

Results: A total number of 111 medical students were included in which 12 (10.81%) were not taking tea while 99 (89.18%) students were regularly consuming tea. Among which only 8 (7.2%) students were not adding sugar to tea and remaining 91(81.81%) students were adding sugar to tea. As a whole the students without tea consumption were having less weight as compared to those consuming tea but the weight of students without consuming tea were significantly less than the students who were using tea even without sugar.

Conclusion: The mean body weight of students who were not consuming tea, were significantly less as compared to the students who were taking tea even without sugar. This may be due to increased plasma insulin level, following stimulation of pancreatic beta-cells by the phenolic compounds present in tea.

Key Words: Body weight, Female medical students, Tea with sugar, Tea without sugar, obesity.

INTRODUCTION

As a whole the body is composed of epithelial, connective, muscular and nervous tissues[1]. Adipose tissue is one of the specialized forms of connective tissue which is a very efficient storage tissue in the body and it represents about 25% of body weight in women. Subcutaneous layers of adipose tissue help to shape the surface of the body as well as a reach source of energy in starvation. It also acts as shock absorber, chiefly in the sole of foot and helps to keep the organs in place during different activities[2].

Numerous gastrointestinal cells secrete hormones which suppress hunger mainly through hindbrain circuits. The hypothalamus integrates adiposity signals, changes response of hindbrain to satiety hormones and also regulates sympathetic outflow which affect brown adipose tissue to generate energy, contributing to the pathogenesis of obesity[3]. Obesity is mainly related to the regulation of food intake and energy balance. The increase in type 2 diabetes is mainly due to increase in the incidence of obesity. As body weight increases, insulin resistance increases but with the reduction in weight insulin resistance is decreased[4]. Obesity is the most common nutritional disorder in which there is an excessive amount of fat in the body which could be caused by factors like age, heredity, endocrine hormones and drugs[5].

Some of the morphological findings observed in many organs of obese rats which showed many histopathological changes in organs like liver, kidney, brain, testis and ovary. In these rats the adipocytes also showed hyperplasia. It has also been noted in these rats that the volume and density of islet were significantly increased as compared to normal rats. All these findings were also associated with increase in weight of concerned organs[6].

Tea having antioxidative properties is a commonly used beverage, available in most part of the world[7]. Tea consumption may result in elevated insulin concentrations due to presence of phenolic compounds in the tea[8]. Previous studies have shown that tea increases insulin sensitivity in Sprague-Dawley rats which could be related to polyphenol, as one of the active components of tea[9]. It has been suggested by some investigators that theaflavins and catechins (polyphenolic compounds), which are present in green and black tea, are mainly responsible for most of the physiological effects of tea[10].

It has been observed that there is an increase in body weight during the first year of insulin treatment in

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most of the patients which reflect the idea that insulin is an anabolic hormone and is also associated with the increase in weight leading to obesity[11]. Many experiments show that elevation in insulin causes hunger and increased food intake leading to "overeating" which is caused by much complex biological, behavioral and environmental factors[12].

Obesity has serious health problems and its prevention is very important. Childhood obesity has increased dramatically since 1990 which need an effective intervention starting as early as possible[13]. The result of another study indicates that obese patients have low lumbar bone mineral density which can lead to easy bone fractures later in life, as a result of minor trauma[14].

As tea is the most common drink with 2-3 teaspoons of sugar per cup in most part of the world thus it is important to know its association with health and disease states[15]. The present study is aimed to know the association of body weight with the tea consumption with or without sugar, in the students of KGMC, Hayatabad Medical Complex Peshawar.

MATERIAL AND METHODS

This study was conducted on medical students of 1st year and 2nd year KGMC Peshawar, during January 2014 to July 2015. A total number of 111 volunteers were instructed to record their weight and tea consumption on observation sheets. After receiving the observation sheet filled by students, the students were divided into two main groups. The students who were not taking tea (black or green tea) were included in group NT. In group T those students were included who were taking tea (with or without sugar). The group T was further subdivided into two subgroups, the TNS consisting of those students who were taking tea without sugar and group TS consisting of students who were taking tea with sugar.

Confidentiality of students was ensured by keeping questionnaires anonymous and without class numbers. Informed consent of students was taken for this study. The Student's t-test was applied for quantitative data. A p-value of ≤ 0.05 was taken significant.

RESULTS

A total number of 111 female medical students were included in this study. Most of the students were taking tea with sugar. The numbers of students in group NT were 12 (10.81%) while numbers of students in group T were 99 (89.18%). The numbers of students in group TNS were 8 (7.20%) and the number of students in group TS were 91(81.98%).

The mean body weight of students in group NT was lesser than the mean weight of students in group T, but this difference was not significant. The mean body weight of students in group NT was significantly

Table 1: Comparison of students taking tea with or without sugar (T), tea with sugar (TS), tea without sugar (TNS) and students without tea consumption (NT)

Groups	N	Weight(kg)	P value
		Mean ± SE	
NT	12	51.37± 1.83	0.30
T	99	53.52 ±0.83	
NT	12	51.37± 1.83	0.04*
TNS	8	60.50 ±3.46	
NT	12	51.37±1.83	0.45
TS	91	52.91 ± 0.83	
TNS	8	60.50 ±3.46	0.06
TS	91	52.91 ±0.83	

(p=0.04) lesser than the student in group TNS. No significant difference were noted when mean body weight of student in group NT were compared with students in group TS.

The mean body weight of students in group TNS was more (p=0.06) than the students in group TS. A combined result of all groups in summarized form is given in Table 1.

DISCUSSION

We observed that a large number of students (89.18%) were taking tea regularly. These finding are consistent with observations of Khan and Mukhtar who suggested that tea is the most widely consumed beverage in the world[10]. Tea beverage consumption is increasing because it has been observed by some investigators that it has a role in decreasing body weight[16] and risk of certain conditions, like breast cancer[17]. The numbers of students in group TNS were 8 (7.20%) which shows that most of the female students use sugar in tea and they don't like the taste of tea without sugar. Those students who were not using sugar with tea were having more weight which could be presumed that they might wanted to reduce their weight by avoiding sugar in tea but this is also in accordance with the result of a study that sugar intake in tea is inversely associated with obesity and small amount of sucrose several times a day has weight reducing effect[18]. Drinking green tea may be weakly associated with a decreased risk of breast cancer.Drinking green tea may be weakly associated with a decreased risk of breast cancer.

The mean body weight of students in group NT (No tea drinking) was lesser as compared to students in group T (Tea user with or without sugar). Although this difference was not significant (p=0.30) but it has certainly give us an idea to investigate further into this matter and find out some association of tea with increased body weight.

The mean body weight of students in group NT (No tea) was significantly (p=0.04) lesser than the student in group TNS (Tea with no sugar). Similarly the finding of another study demonstrated that 1.0g tea drink increased plasma insulin levels following stimulation of pancreatic beta-cells due to the presence of phenolic compounds in the tea[8]. Insulin is the major regulator of glucose and fatty acid metabolism. High insulin levels after meals promote triglyceride accumulation leading to increase in weight. But low insulin level during starvation leads to weight reduction due to lipolysis[19].

No significant (p=0.45) difference were noted when mean body weight of student in group NT (No tea) were compared with students in group TS (Tea with sugar). However the mean weight of students using sugar with tea (TS) was more as compared to those who don't take tea (NT).

The mean body weight of students in group TNS (Tea with no sugar) was even more (p=0.06) than the student in group TS (Tea with sugar). This effect of tea may be mainly due to its local chemical action on gastric mucosa. Tea without milk and sugar may result in a higher acid response by the stomach mucosa which can be reduced by adding milk and sugar[20]. It could be presumed that the students using tea without sugar may have more insulin release secondarily due to profound gastric effects, like certain drugs[21], and ultimately more insulin would lead to more weight gain. It has been observed that some other factors besides nutrients may be involved in insulin release after food ingestion[22].

CONCLUSION

Excessive body weight gain is mainly due to increased fat deposition in adipose tissues of the body. The environmental factors like diet and exercise may play some role in this increase in body weight leading to obesity and associated problems. Tea is the most widely and regularly consumed beverage among the students. The mean body weight of students who were not taking tea, were significantly less than the students who were taking tea even without sugar. This may be the result of increased plasma insulin levels following stimulation of pancreatic beta-cells by the phenolic compounds, present in tea. High insulin level promotes hunger and high triglyceride accumulation in fat cells which may be the cause of weight gain.

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