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The effects of total extract and its different fractions of Iranian black orthodox tea on weight, food intake and blood sugar in type I diabetic rats

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Objectives: Diabetes is one of the most common endocrine disorders, obesity, improper nutrition, and inactivity was considered as proposing factors. Historically plant extracts are used for diabetes control. This study was implemented to determine the effect of total and different fraction of Iranian black orthodox tea on weight, food intake and blood sugar in type I diabetic rats. **Methods:** This study was conducted on 56 rats which were randomly divided in to 8 groups (7 rats in each group). The weight of rats was 200 – 250 gr. Group 1 and 2 was non-diabetic, groups 3 – 8 were diabetic, and diabetes was induced with intraperitoneal injection of streptozotocin 60mg/kg. Group 1 to 8 received carrier, total extract, carrier, total extract, methanol fractions of 20%, 40%, 60% and 80% plus 100% respectively. Blood sugar was measured beginning and end of intervention, weight and food intake was measured each week during intervention (5 times). Data was analyzed by using one and two ways ANOVA, repeated measure and nested variance. **Results:** Food intake and weight was reduced, in 40% fraction received group, significantly more than other groups ($p=0.000$). also total extract decreased food intake significantly ($p=0.000$). There were no significant differences between other groups. Change in Mean blood sugar between groups during intervention was not found statistically significant. **Conclusion:** It can be concluded that injection of total extract and 40% fraction of black tea had positive effect on decreasing of food intake in diabetic rats and prevention of obesity. Therefore consumption of black tea might prevent from diabetes and its complications.

Keywords: Black tea, Diabetes, Rat.

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7- References:

1. www.worlddiabetesday.org/go/wdd2006.
2. British Medical Association, Diabetes Mellitus—an update for healthcare professionals. BMA Board of Science and Education, 2004, 6.
3. Wilds Roglic G., Green A., Sicree R., Hilary K. Global prevalence of diabetes. *Diabetes care.*, 2004, 27(5): 1046-52.
4. Raynuld B., Jun Y., John W. PPAR Agonism prevents the onset of type2 Diabetes in ZDF rats. *Endocrinology.*, 2006, 10 : 1210.
5. Arulozhi D.K., Veeranjanyulu A., Bodhankars L. Neonatal streptozotocin – induced rat model of type2 diabetes mellitus. *Indian jurnal of pharmacology*, 2004,36 (4):217-221.
6. Vanessa C., Gary W. Areview of the health effects of green tea catechins in invivo animalmodels. *J.nutr*, 2004,134: 3431s-3440s.
7. Sabu M., Smitha K., Ramadasan K. Anti – diabetic activity of green tea polyphenols and their role in reducing oxidative stress in experimental diabetes. *Journal of Ethno pharmacology*,2002, 83(1-2): 109-116.
8. Han Lk.,Takoku T., Kimura Y., Okuda H. Anti-obesity of Oolong tea. *Int J obes Relat Metab Disord*, 1999, 23(1): 98-105.
9. Jen-Kun L., Shoel Y.Mechamisms of hypolipidemic and anti- obesity effects of tea and tea polyphenols. *Mol. Nutr. Food Res*, 2006, 50:211-217.
- 10- swen w.,Ying W.,Frank T. Anti-obesity effects of green tea: from beside to bench. *Mole.Nutr. Food Research*, 2006,50(2): 176-187.
11. Gupta S.,saha B.,Giri A.K.comparative antimutagenic and anticlastogenic effects of green tea and black tea. *Mutation Reaserch*, 2002,512 :37-65.
13. Amitabye TR., Theeshan B., Alan C., Vivginia Z. Characterizatin of the antioxidant function of flavonoids and proantho cyanidins in Mauritian black teas. *Food. Research International* , 2005, 38: 357-367.
14. Yung H., Hsin H. Tea, Obesity ,and diabetes. *Mol. Nutr. Food Res*, 2006, 50,188-210.
15. Kuan L., Meng S., Chun T.Comparative Studies on the hypolipidemic and growth suppressive effects of Oolong, Black,Pu-erh, and green tea leaves in rats.*J.Agric.Food Chem*,2005,53:480-489.
16. Anton R. Sheil W. Antioxidant effects of tea: Evidence from human Clinical trials. *J. Nutr.* 2003, 133: 3285s – 3292s.
17. Balz F., Jane V. Antioxidant activity of tea polyphenols in vivo: evidence from animal studies. *J. Nutr*, 2003,133: 3275s – 3284s.
18. Pon V., Kuruvimalai E., Chennam S. Therapeutic effect of green tea extract on advanced glycation and cross effect of green tea extract on advanced glycation and cross – linking of collagen in the aorta of streptozotocin glycation and cross – Linking of collagen in the aorta of streptozocin diabetic rats. *Clinical and Experimental pharmacology and physiology*, 2006, 33: 351 – 357.
19. Pon V., Kuruvimalai E., Chennam S. Therapeutic effect of green tea extract on oxidative stress in aorta and heart of streptozotocin diabetic rats. *Chemico – Biological Interactions*, 2006, 162: 114 – 120.
20. Baydas G., Nedzvetskii V.S., Nerush P.A., Kirichenko S.V. Altered expression of NCAM in hippocampus and cortex may underlie memory and learning deficits in rats with streptozocin – induced diabetes mellitus. *Life science*, 2003, 73 : 1907-16.
21. Changrani N.R., Chonkar A., Adeghate E., Singh J. Effects of streptozotocin-induced type 1 diabetes mellitus on total protein concentrations and cation contents in the isolated pancreas,parotid,submandibular,and lacrimal glands of rats.*Ann N Y Acad Sci*, 2006 ,1084:503-19.
22. Joe A., Yousef A. Effect of green and black tea supplementation on lipids, lipid oxidation and fibrinogen in the hamster: me chanisms for the epidemiological benefits of tea drinking. *FEBS Letters*, 1998, 433:44 – 46.
23. Noboru H., Norihiro Y., Midori M. Powdered green tea has antilipogenic effect on zucker rats fed a high fat diet. *Phytother. Res*, 2003, 17: 477 – 480.
24. Yung K.,Richardo H.,Shutsung L. Modulation of endocrine systems and food in take by green tea

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- epigallocatechin gallate. *Endocrinology*, 2000, 141(3): 980-987.
25. Jonathan M., Hodgson B., Gerald F., Watts J. Regular ingestion of black tea improves brachial artery vasodilator function. *Clinical Science*, 2001, 102:195-201
26. Ming Y., Cheng W., Hsiao C. Green, Oolong and black tea extracts modulate lipid metabolism in hyperlipidemia rats fed high -sucrose diet. *The Journal of Nutritional Biochemistry*, 2001, 12:14-20.
27. Yoko k., Miho S., Hideo S., Soichi A., Yukihiko H., Koichi S. Green tea polyphenols innibit the sodium- dependent Glucose Transporter of intestinal epithelial cells by a compititive mechanism. *J.Agric.Food Chem*, 2000, 48(11):5618-5623.
28. Vinson A., Zhang J. Black and green teas equally inhibit diabetic cataracts in a streptozotocin-induced rat model of diabetes. *J.Agric. Food Chem*, 2005, 53 (9): 3710-3713.

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