Correlation through Fruit Consumption with Low GI Diet in the Control of Glycemia and the Risk for CHD

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Introduction

The increase of sugar consumption, especially of fructose taken in the form of syrup from corns, has attracted the attention for its negative influence on health. Worries about this are increased in relation with the body weight, risk for diabetes and coronary diseases. Sugars and fruit are seen from a different viewpoint and it is recommended their consumption together with the egetables, corns, consumption in order to be healthy and avoid diseases as diabetes, coronary diseases and cancer. This looks contradictory in relation with the effects of sugar as part of fruit and fibers which limit the scale of absorbing on the gastrotestinal track resulting the change glycemia level. The consumption of the fruit as a whole it is accompanied with the change of the glycemia level compared to taking the concentrate of the fruit on the form of pure and even more when it is compared with the fruit juices.

Glycemic Index (GI)

Glycemic index is a new notion which fulfills the notion of quick and slow sugars. It is the answer given by food which contain 50 grams of carbohydrates after their consumption. (As a reference it is taken white bread GI=100). The higher the glycemic index of a food the higher is the level of glycemia after the food is consumed. The glycemic index changes from the type of the food. Food with high GI should be reduced or it should be taken at the end of the food.

Glycemic Index (GI)

Fruits in general have and glycemic index from 56-103 UI. The value under 55 UI it is considered as low, 55-69UI as medium and above 70 UI is high. Roasted potatoes> bread> rice and boiled maize >dower Glicemic index increases more when food is cooked (like pure > of potatoes)

Values of GI

Foods	Glycemic Index
Roasted potatoes	135
Bread	100
Sugar	87
Corns	72
Spaghetti	66
Orange juice	74
Beans	54

Ice cream   52
Milk   39

GI Cassification

Categories	Reference Glucose	Reference White bread
Low	**<55**	**<60**
Medium	**55-70**	**60-85**
high	**>70**	**>85**

Methods

In this study which intends the use of opportunities and evaluation in relation to fruit consumption with low GI in metabolic changes as part of the diet in general participated 210 people and it lasted May 2008 – December 2010. The participants were men, women in the period on menopause who suffered from diabetes type 2, taking peoral, and equilibrated diabetes in the last three months with values of HbA1C through 6.5-8%. No one suffered from cardiovascular, renal and hepatitis diseases clinically (ALT <3 times higher than the norm) and no one was treated for cancer. There were used two diets:

   a) Diet with fruits with low GI
   b) Diet with high cereal fibers

There were measured: Weight, PA (3 measurements in an interval of one minute), cholesterol, triglycerides, HDL-K, LDL-K. It was advised:

   ➢ Continuation of medical treatment
   ➢ Physical exercises
   ➢ Diet
   ➢ Reduction of the use of saturated fat, cholesterol,
   ➢ Consumption of fruits with low GI
   ➢ Cereals which contain an increased number of fibers.

84 % of the participants were overweight with BMI >25 kg/m2 and the other part were suffering from obesity with BMI >30 kg/m2 and all of them wanted to lose weight. Carbohydrates were taking 42-43 % of the daily calories. The diet with fibers: grain bread, cereals for breakfast, rice not boiled well, beans, barley, rye, tropical fruit (bananas, mango, watermelons, and melons). Diets with mild fruits: apples, pears, oranges, mandarins, citrus, fruits with small beans like blueberries, raspberries, raspberry cane, plums, peaches, nectars, dried plums. Mild fruits have GI<70UI, tropical fruits have GI>70UI.

Results

Out of 210 people only 150 of them finished the study completely. The consumption of the fruits with low GI was accompanied with the reduction of the arteries pressure, risk for CHD, HbA1C (%). Expressed in % of the total use of carbohydrates was found in negative relation with HbA1C and the risk for cardiovascular and positive relation with HDL-K. HbA1C was reduced – 0-8% in the group with the diet with low GI fruits and -0.3% in the group with the diet with high cereal fibers. HDK-L was increased -7.3% more in the group with the diet with low GI

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fruits PA systolic was decreased -4% more in the group with the diet with low GI fruits. The risk for cardiovascular diseases was decreased -13% more on the group with the diet with low GI fruits. Fruits with low GI and bread with low GI together or independently foresee changes in HbA1C.

Table No 1

HbA$_{1c}$	r	−0.135	−0.219	−0.228	0.121	−0.073	−0.218
	p	0.096	0.007	0.005	0.136	0.372	0.007
Glucose	r	−0.125	−0.008	−0.167	−0.014	−0.030	−0.141
	p	0.124	0.918	0.040	0.863	0.715	0.083
Weight	r	−0.016	0.112	−0.096	0.123	−0.136	−0.014
	p	0.846	0.170	0.239	0.132	0.095	0.865
Total cholesterol	r	−0.098	−0.001	0.019	−0.052	0.103	−0.020
	p	0.228	0.990	0.813	0.522	0.208	0.804
LDL-cholesterol	r	0.013	−0.007	−0.070	−0.009	0.059	0.007
	p	0.872	0.928	0.395	0.911	0.473	0.930
HDL-cholesterol	r	0.223	0.156	−0.105	0.098	0.060	0.216
	p	0.006	0.055	0.199	0.231	0.459	0.008
TG	r	−0.210	−0.069	0.233	−0.090	0.103	−0.070
	p	0.009	0.396	0.004	0.268	0.208	0.394
C-reactive protein	r	0.031	−0.004	−0.071	0.151	0.050	0.065
	p	0.716	0.960	0.403	0.075	0.559	0.443
Systolic blood pressure	r	−0.017	−0.006	−0.302	−0.035	−0.034	−0.122
	p	0.839	0.940	0.000	0.666	0.682	0.134
Diastolic blood pressure	r	−0.017	−0.140	−0.162	0.035	0.069	−0.067
	p	0.833	0.086	0.046	0.667	0.400	0.410
CHD risk	r	−0.211	−0.089	−0.067	−0.099	0.039	−0.192
	p	0.009	0.274	0.409	0.223	0.635	0.018

Discussion

The consumption of the fruits with low GI was accompanied with a significant benefit on the control of glycemia, fat, arterial pressure, micro and macro vascular complications of diabetes the treatment of which is a major therapeutic goal for diabetes type 2. The consumption of small quantities of fructose influences on the metabolism of glucose, reduction of postprandial glycemia, increase of 3 times of glycogen synthesis on the liver, lowers the production of glucoses from the liver in db. Type 2 (increasing fructose 1 phosphate). The consumption of the fruits with low GI including here the consumption of fructose 7-10 gr. It has a wide effect on the reduction of postprandial glycemia. The consumption of fructose in big quantities is accompanied with the increase of Tg. LDL-K, especially at men, the increase of fat organs and damaged tolerance of glucose as a result of risk increase for cardiovascular diseases. Fruits in general are sources of fibers, minerals, antioxidants which reduce the % of lipids, oxidative damages, decrease PA, improve the control of diabetes and decrease the risk of sem. C/v. The selection of fruits with low GI is accompanied with decrease of HbA1C. The consumption of small fruits influences negatively at PA but positively at Tg. The apple ha a negative rapport with Tg. Kol. Total/LDL-K and positively in HDL-K There were not identified significant changes on the consumption of pear and plums. There were no significant changes in the two groups related with BMI and body weight.

This suggests that the effect of fruits with low GI on the decrease of the level of HbA1C is widely related independent with the lost of body weight.

Table No2

Table   Regression analysis of total fruit, fibre and key low GI diet components against change in HbA_{1c}

Key diet components[a]	Adjusted r	Regression model, p value	Key component, p value
Low GI fruit	−0.233	0.011	0.0017
Low GI bread	−0.228	0.012	0.002
Parboiled rice	−0.069	0.299	0.124
Legumes	−0.047	0.346	0.157
Low GI cereal	−0.032	0.372	0.176
Pasta	−0.050	0.456	0.252
Bulgar	−0.052	0.462	0.258
Barley	−0.101	0.689	0.672

Conclusions

The consumption of the fruits with low GI is accompanied:

A) Decrease of the level of HbA1C, PA, HDL-K and the risk for cardiovascular diseases.

B) Fruits with low GI play an important role in the management of diabetes type 2.

Reference

D.J.A.Jenkins; K.Srichaikul; C.W.C Kendall; J.L. Sievenpiper; S.Abdulnour; A. Mirrahimi; C.Meneses; S.Nishi; X.He; S.Lee; Y.T.So; A.Esfahani; S.Mitchell; T.L. Parker; E. Vidgen; R.G.Josse; L.A.Leiter.

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