



含鉻酵母、膳食纖維配方對於第2型糖尿病患營養及生理狀況的影響



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研究動機

近年來糖尿病的盛行率已逐漸提高，飲食控制對於糖尿病的治療上非常重要。研究指出膳食纖維可延緩血糖並改善血脂肪，鉻酵母也與調節血糖有關。本研究目的第2型糖尿病患的飲食中，以含有鉻酵母的配方，了解其生理狀況的變化。

材料與方法

受試者進行6個月的飲食介入，以3天之24小時飲食回憶紀錄評估受試者飲食。

研究共分為2個部份。第一部份，測量實驗配方的昇糖指數和第二部份，為期6個月的飲食介入實驗。

昇糖指數實驗中，受試者攝取相當於50公克糖類的葡萄糖水、白吐司、試驗配方，測量血糖及其含鉻配方之昇糖指數。第二部份共有受試者30名，每天持續服用藥物且不改變藥量，以每日攝取50公克共177大卡的含鉻營養品取代一般飲食熱量，其中含鉻200微克、膳食纖維7.2公克，為期24週，並於第0、1、3、6、7個月收集血液樣本分析，項目包括空腹血糖、糖化血色素、三酸甘油酯、總膽固醇、低密度脂蛋白膽固醇、高密度脂蛋白膽固醇、及營養狀況分析。

研究結果

含鉻酵母配方與白吐司及葡萄糖溶液比較昇糖指數分別為10.7、17.2，屬於低昇糖指數配方；而在6個月的飲食介入試驗中，在第0、1、3、6、7個月的空腹血糖濃度、糖化血色素、總膽固醇、低密度脂蛋白膽固醇、高密度脂蛋白膽固醇、皆無顯著差異。而對於血液尿素氮及肌酸酐的指數在第0、1、3、6、7個月亦無顯著差異。

Table 1. Change in body weight, body mass index, body fat of subjects¹

	Month 0	Month 1	Month 3	Month 6	Month 7
Body Weight (kg)	63.8 ± 10.3	63.6 ± 10.2	63.1 ± 9.7*	63.5 ± 9.5	63.7 ± 9.3
BMI (kg/m ²)	25.7 ± 4.2	25.6 ± 4.0	25.4 ± 3.9*	25.5 ± 3.9	25.7 ± 3.8
Body Fat (%/kg)	30.2 ± 10.2	29.9 ± 10.2	28.5 ± 10.0*	29.9 ± 10.7	30.8 ± 10.1*

¹ Values are mean ± SD

* In each row, values sharing different superscript letters are significantly different from one to Month 0 by t-test at p < 0.05

Table 2. Daily intake of energy, protein, fat and dietary fiber in subjects¹

	Month 0	Month 3	Month 6	Month 7
Calorie (Kcal)	1580.7 ± 345	1495.7 ± 316	1536.4 ± 336	1536.4 ± 315.9
Protein (g)	62.3 ± 13.4	64.3 ± 14.3	64.0 ± 13.9	61.7 ± 13.4
%en ²	16.2 ± 2.9	17.5 ± 2.2*	17.0 ± 2.6	16.6 ± 3.4
Fat (g)	58.3 ± 21.9	55.6 ± 18.4	59.0 ± 17.7	57.6 ± 15.5
%en	32.1 ± 7.4	32.9 ± 7.8	34.0 ± 6.1	33.1 ± 5.5
Carbohydrate (g)	202.3 ± 49.0	182.6 ± 45.8*	186.8 ± 49.7*	192.8 ± 43.7
%en	51.6 ± 7.6	49.6 ± 8.2	49.0 ± 7.1	51.5 ± 6.5
Dietary fiber (g)	11.5 ± 4.5	16.6 ± 5.0*	17.2 ± 4.3*	11.0 ± 4.3

¹ Values are mean ± SD

² en%, % of energy

* In each row, values sharing different superscript letters are significantly different from one to Month 0 by t-test at P < 0.05

Table 3. Serum lipid profile of study subjects^{1,2}

	Month 0	Month 1	Month 3	Month 6	Month 7
TC ² (mg/dL)	198.7 ± 38.9	211.4 ± 45.6*	217.5 ± 45.7*	217.7 ± 49.8*	213.4 ± 44.4*
TG ² (mg/dL)	130.1 ± 61.3	162.0 ± 125.8*	146.0 ± 83.3	133.6 ± 73.9	148.0 ± 83.6*
LDL-C ² (mg/dL)	128.0 ± 34.8	128.1 ± 39.5	134.0 ± 38.4	122.1 ± 40.9	121.0 ± 35.8
HDL-C ² (mg/dL)	51.1 ± 9.8	50.3 ± 9.6	49.0 ± 12.9	50.4 ± 9.4	50.7 ± 10.4

¹ Values are mean ± SD

² TC: Total cholesterol; HDL-C: High density lipoprotein cholesterol; TG: Triglyceride; LDL-C: Low density lipoprotein cholesterol

* In each row, values sharing different superscript letters are significantly different from one to Month 0 by t-test at P < 0.05

Table 4. Effect of chromium yeast formula on liver and renal status in subjects¹

	Month 0	Month 1	Month 3	Month 6	Month 7
AST ² (IU/L)	22.90 ± 11.00	22.10 ± 11.58	28.57 ± 22.63	25.56 ± 12.13	24.60 ± 14.94
ALT ² (IU/L)	22.73 ± 13.31	23.40 ± 12.42	30.47 ± 33.21	25.83 ± 19.07	26.90 ± 24.04
BUN ² (mg/dL)	16.28 ± 4.43	17.52 ± 7.55	18.24 ± 5.64*	17.72 ± 6.29	18.47 ± 7.63
Creatinine (mg/dL)	1.03 ± 0.23	1.07 ± 0.24	1.02 ± 0.21	1.08 ± 0.24	1.09 ± 0.31*
Uric acid (mg/dL)	5.26 ± 1.32	5.61 ± 1.75	5.36 ± 1.92	5.48 ± 1.76	5.62 ± 1.67

¹ Values are mean ± SD

² AST: Aspartate aminotransferase; ALT: Alanine aminotransferase; BUN: blood urea nitrogen

* In each row, values sharing different superscript letters are significantly different from one to another by t-test at P < 0.05

討論

由以上結果可知本實驗配方屬於低昇糖指數配方適合第2型糖尿病患作為營養補充品。