

## 第 2 型糖尿病患者攝取高量膳食纖維對其血脂肪的影響

### Effects of high dietary fiber intake on plasma lipid profile in type 2 diabetic patients

#### 中文摘要

由於第 2 型糖尿病患者罹患冠心症的比例較一般健康者高，其原因與糖尿病患者的血脂質容易異常有非常大的關係。而膳食纖維在許多研究中已被指出，具有延緩第 2 型糖尿病患者血糖上升、改善血脂質的效果，進而可以有預防或治療冠心症的發生。因此美國糖尿病協會（American Diabetes Association；ADA）建議糖尿病患者每日應攝取 20-35 公克的膳食纖維，尤其是全穀類、蔬菜類及水果類等複雜型碳水化合物的食物來源。然而隨著飲食習慣與型態的改變，國人的膳食纖維攝取量普遍低於建議量(平均每日粗纖維攝取量為 6.1 公克，約等於 18 公克的膳食纖維)。

研究目的以飲食中添加米麩的方式，增加第 2 型糖尿病患者膳食纖維的攝取量，進而了解其對患者血脂質的影響。本研究共分為 2 個部分，為期 4 週（第一部分）和為期 12 週（第二部分）的飲食介入實驗，受試者在實驗期間每日增加食用 20 公克米麩，且每天仍持續服用藥物且不改變藥量。結果共分別招募 11 位、6 位的第 2 型糖尿病的受試者。收集受試者第 0 週、第 4 週（第一部分）及第 12 週（第二部分）之空腹靜脈血及餐後第 30、60、90、120 及 180 分鐘餐後靜脈血。研究顯示：受試者在攝取米麩後，第一部分（為期 4 週）男性受試者血漿中總膽固醇、三酸甘油酯、低密度脂蛋白膽固醇、apo A1 及 apo B 皆有下降的趨勢，分別下降 3.2%、17.8%、3.8%、17.0% 及 8.0%；而女性受試者血漿中低密度脂蛋白膽固醇、apo A1 及 apo B 也有下降的趨勢，分別下降 5.2%、25.2% 及 22.9%，其中 apo A1 在實驗前後有統計上的差異（ $p < 0.05$ ）。第二部分（為期 12 週）不論男女性受試者血漿中總膽固醇、三酸甘油酯、高密度脂蛋白膽固醇、低密度脂蛋白膽固醇、apo A1 及 apo B 皆有下降的趨勢，分別下降 2.5%、4.5%、12%、15.5%、8.1 及 17.7%。由以上結果可知，增加第 2 型糖尿病患者膳食纖維的攝取，確實會使血漿中的血脂質有下降的趨勢，進而達到降低冠心症的發生率。

#### 英文摘要

Type 2 diabetic patients are at higher risk of coronary heart disease than health people, because of their abnormal blood lipids. Many studies have shown a beneficial effect of dietary fiber from delaying glycemic raise and improving blood lipids in type 2 diabetic patients, furthermore preventing and treating the coronary heart disease. Therefore the American Diabetes Association (ADA) recommends diabetic patients to intake 20 to 35 grams dietary fiber per day, especially increasing consuming the complex carbohydrate source from whole grains, vegetables and fruits. However,

following the change of dietary habit and lifestyle, the really dietary fiber consumption in Taiwan is lower than recommend, the average crude fiber consumption is only 6.1 g/day (it is about 18 gram of dietary fiber).

The aims of the study were to investigate the effect of rice bran intake on plasma lipid profile in type 2 diabetic patients. Study was divided into two parts-4 weeks dietary intervention (the first part) and 12 weeks dietary intervention (the second part), subjects were given 20 grams of rice bran per day and would not change the medicine doses in this period. A total of 11 (the first part) and 6 (the second part) subjects, venous blood samples were collected from subjects during the fasting and the time point of 30, 60, 90, 120 and 180 minutes after breakfast at week 0, 4 (the first part) and at week 0, 12 (the second part). The levels of plasma total cholesterol, triglyceride, low-density lipoprotein cholesterol (LDL-C), apolipoprotein AI (apo AI) and apolipoprotein B (apo B) in first part male subjects had decreased by 3.2%, 17.8%, 3.8%, 17.0% and 8.0%. And the levels of plasma LDL-C, apo AI, apo B in female subjects had decreased by 5.2%、25.2% and 22.9% respectively. Apo AI was significantly decrease ( $p < 0.05$ ). The levels of plasma total cholesterol, triglyceride, HDL-C, LDL-C, apo AI and apo B levels in all second part subjects had decreased by 2.5%, 4.5%, 12%, 15.5%, 8.1% and 17.7% respectively. As the results that increased consumption of dietary fiber in type 2 diabetic patients could decrease the plasma lipid profile, with a risk reduction for coronary heart disease.