糖尿病患者血液中三價鉻與葡萄糖及脂質濃度之相關性

Correlation Between Blood Chromium (III) Level, Blood Glucose and Lipid Concentrations in Diabetes

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摘要

本研究主要目的評估人體血液中微量礦物質－三價鉻含量與血糖、糖化血色素、胰島素及血脂質濃度的關係。研究對象乃篩選成年男女共 84 人(年齡在 40~70 歲，男 41 人，女 43 人)，依據其血糖濃度分成三組，正常血糖組(空腹血糖濃度值小於 7.0 mmol/L，n=22)，輕度高血糖組(空腹血糖濃度值介於 7.0 至 8.3 mmol/L，n=24)，重度高血糖組(空腹血糖濃度值大於 8.3 mmol/L，n=38)。分析三組血液中的血糖、糖化血色素，胰島素及血脂質之濃度以及鉻之含量，以探討和醣類及脂質代謝有關之微量元素鉻在醣類及脂質代謝上是否有影響。結果顯示：重度高血糖組及輕度高血糖組的血液中鉻含量比正常血糖組低，有統計上之差異($p<0.05$)；三酸甘油酯、總膽固醇與高密度脂蛋白膽固醇比值、低密度脂蛋白膽固醇與高密度脂蛋白膽固醇比值以重度高血糖組顯著高於正常血糖組，且有統計上之差異($p<0.05$)。血液中的鉻含量與空腹血糖及胰島素濃度量呈顯著負相關($r=-0.9931$； -0.9529)，血液中鉻含量與低密度脂蛋白膽固醇及三酸甘油酯濃度也呈極顯著負相關($r=-0.8504$； -0.9894)。隨著糖尿病患者血糖濃度增加，血液中鉻含量會顯著降低，造成胰島素功能不良，進而引起脂質的代謝異常，顯示糖尿病患微量礦物質鉻之營養狀況較正常血糖者差。

Abstract

This study investigated the correlation between blood chromium (III) concentrations n normal, mild hyperglycemia and severe hyperglycemia for hemoglobin A1c (HbA1c), serum insulin and serum lipid concentrations. Eighty-four elderly subjects (aged 40~70 years; 41 male and 43 female) were divided into three groups: severe hyperglycemia group (fasting glucose > 8.3 mol/L, n = 38), mild hyperglycemia group (fasting glucose = 7.0~8.3 mol/L, n = 24) and normal group (fasting glucose < 7.0 mol/L, n = 24). The fasting glucose, postprandial glucose and hemoglobin A1c concentrations were higher ($p < 0.05$) in the mild hyperglycemia group and severe hyperglycemia group than the normal group. The blood chromium (III) concentration was lower ($p < 0.05$) in the severe hyperglycemia group and mild hyperglycemia group than the normal group. Triglyceride concentration, ratios of total cholesterol to HDL-cholesterol and LDL-cholesterol to HDL-cholesterol were higher in the severe hyperglycemia group and mild hyperglycemia group than the normal group. There was s significant negative correlation ($r = -0.9931$; -0.9529) between blood chromium level and fasting glucose or fasting insulin concentration. There was a significant negative correlation ($r = -0.8504$; -0.9894) between blood chromium level and LDL-cholesterol or triglyceride concentration. These results suggest that the blood chromium (III)

concentration decreased with increasing blood glucose concentration and serum lipids in diabetes.