高血膽固醇者血中銅鋅值及銅相關抗氧化酵素活性的探討
Blood Copper and Zinc Levels and Copper-related Antioxidant Enzyme Activities in Hypercholesterolemic Subjects

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摘要

本研究主要的目地是藉著生化指標來評估人體微量礦物質－銅和鋅的營養狀況與血膽固醇之關係。研究對象乃篩選成年男女共 79 人（平均年齡約 55 歲，男 35 人，女 44 人），依據血膽固醇值分成三族群，高血膽固醇組（總膽固醇值大於 240mg/dL，n=23），邊緣性高血膽固醇組（總膽固醇值介於 200 至 240mg/dL，n=31）及正常血膽固醇組（總膽固醇值小於 200mg/dL，n=25）。分析三組血中的脂質，銅、鋅值以及藍胞漿素(Ceruloplasmin; Cp)、SOD(superoxide dismutase)、GSHPx(glutathione peroxidase)，以探討和銅相關的一些因子是否在膽固醇代謝上占一角色。結果顯示：高血膽固醇的血漿膽固醇、三酸甘油酯、低密度膽固醇濃度與正常組的比較時顯著較高($p<0.05$)，高血膽固醇組血漿銅濃度比正常血膽固醇組低，且有統計上這差異($p<0.05$)，三組間的 Cp、SOD 和 Zn 值則無統計上之差異。相關係數分析血中的脂質和銅、SOD、Cp 值間無相關性，但正常組血中 GSHPx 和 SOD、Cp 值間有正相關性($r=0.4$, $r=0.45$, $p<0.05$)而高血膽固醇組卻無此關係存在。

Abstract

Hypercholesterolemia has been shown to be a consequence of dietary copper (Cu) deficiency in experimental animals. There are several biochemical changes induced by Cu deficiency. We examined the lipid level, superoxide dismutase (SOD), glutathione peroxidase (GSHPx), ceruloplasmin (Cp) and plasma Cu and Zn levels in hypercholesterolemic subjects (N=23, total cholesterol (TC)≥240mg/dL); borderline hypercholesterolemic subjects (N=3l, 200≤TC<240mg/dL) and control subjects (N=25, TC<200mg/dL). Total cholesterol, triglyceride (TG), and low density lipoprotein (LDL-C) levels were higher in hypercholesterolemic subjects than in the normal subjects ($p<0.05$). Hypercholesterolemic subjects had lower Cu levels than the control subjects ($p<0.05$). The SOD, Cp, and Zn levels in the hypercholesterolemic subjects did not significantly differ from those in the control group. Lipid levels were not related to plasma Cu, SOD, and Cp among the three groups. Plasma GSHPx levels were positively correlated with SOD and Cp values in the control subjects ($r=0.40$, $r=0.45$, $p<0.05$), but the relationship was not found in hypercholesterolemic subjects.