高血膽固醇者的飲食型態以及血中銅、鋅的濃度和相關抗氧化酵素的探討

The characteristics of dietary pattern and copper／ zinc level 、copper related antioxidant enzymes in hypercholesterolemic subjects.

中文摘要

本研究主要的目的是藉著生化指標來評估人體微量礦物質－銅、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 240 mg/dl n＝23)，邊緣性高血膽固醇組 (總膽固醇值介於 200 至 240 mg/dl n＝31)及正常膽固醇組 (總膽固醇值小於 200 mg/dl n＝25)。分析三組血中的脂質，銅、鋅值以及 Ceruloplasmin、SOD 及 GSHPx 酵素的活性，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。另一方面，由於影響血膽固醇的因素甚多，因此本研究亦對受試者進行飲食問卷的評估，以了解受試者飲食之狀況和血膽固醇的關係。結果顯示：高血膽固醇組的三酸甘油酯、低密度膽固醇與正常組比較時有明顯較高 ($p<0.05$)，GSHPx 在三組之間有統計上的差異 ($p<0.05$)，高血膽固醇組最低，正常血膽固醇組最高。高血膽固醇組血漿銅濃度比正常膽固醇組低，且有統計上之差異 ($p<0.05$)，但在 Ceruloplasmin、SOD 方面則無統計差異。在飲食問卷方面，國人一般主要膽固醇、脂質食物來源的攝取上：三層肉類的攝取在高血膽固醇組與正常組之間有統計上的差異，即前者攝取三層肉類頻率較高 ($p<0 .05$)，在粗纖維的攝取上：水果類和葉菜類食物在此二組之間也有統計上的差異 ($p<0.05$)。在飲食行爲上三組間無統計上的差異；與脂質有關的營養認知上，三組在總得分上有統計上的差異 ($p<0.05$)，即對高血膽固醇組受試者的營養教育上應多加強。

英文摘要

Hypercholesterolemia has been shown to be a consequ- ence of dietary copper (Cu) deficiency in experime- ntal animals. There are several biochemical changes in Cu deficiency. We examined the lipid level, sup- eroxide dismutase (SOD), glutathione peroxidase (GSHPx), ceruloplasmin (Cp) and plasma Cu and Zn levels in hyperchoesterolemic subjects (N=23, TC>240 mg/dl) borderline-hypercholesterolemic subjects (N=31, 200 ≦TC< 240mg/dl) and control subjects (N=25, TC<200mg/dl). Total cholesterol、TG and LDL-C levels appeared to be higher than normal in hypercholesterolemic pa- tients (p<0.05). However, the SOD、Cp and Zn levels in hypercholesterolemic subjects didn't significantly differ from control. Hypercholesterolemic subjects had lower Cu level than control's ($p<0.05$). As a result, lipids levels were not related to plasma Cu 、SOD and Cp among the three groups. Plasma GSHPx levels was positively correlated with SOD 、Cp value in control subjects ($r=0.40$, $r=0.45$ $p<0.05$), but no correlation in hypercholesterolemic subjects was found. Results of semiquantitative food frequency questio-nnaire (FFQ) showed that intake of fatty meat was higher in hypercholesterolemic subjects than control, but the intake of crude fiber of fruits and leafly -vegetable had significant reverse relationship ($p<0.05$). The score test of nutritional knowledge in hypercholesterolemic subjects were lower than the other two groups ($p<0.05$).