

職場男性員工吸菸和飲用咖啡與心血管疾病危險性之相關性研究

Cardiovascular risk of male workers:relationship with smoking and coffee consumption.

中文摘要

本研究目的為探討纖維蛋白溶酶原活化物第一型抑制物 (plasminogen activator inhibitor type-1, PAI-1) 及砷甲基化代謝能力與高血壓的相關性。研究對象選自民國 91 年 8 月參加嘉義縣衛生局於布袋鎮舉辦的複合式成人健康檢查的居民。由接受過標準化問卷訓練的訪員利用結構式問卷訪視每位研究對象,問卷內容包括基本人口學資料、抽菸和喝酒習慣、疾病史、居住史及飲水史等項目。本研究選取 300 位有完整問卷資料、脂質檢驗值及血液和尿液檢體的民眾來進行實驗分析。白血球萃取之 DNA 利用聚合酶鏈鎖反應分析纖維蛋白溶酶原活化物第一型抑制物 4G/5G 基因多形性。以酵素連結免疫吸附分析法測定血漿中 PAI-1 的濃度。利用高效能液相層析儀分離尿液砷物種,三價砷、五價砷、單甲基砷酸及雙甲基砷酸,並經由氫化式原子吸收光譜儀測量濃度。調整年齡和性別後,身體質量指數、血壓、三酸甘油酯、總膽固醇和低密度脂蛋白與高血壓顯著相關。調整年齡和性別後,PAI-1 為 4G4G 或 4G5G 基因型者,罹患高血壓的危險性較基因型為 5G5G 者小,危險對比值為 0.70 (95%信賴區間為 0.39~1.25)。三酸甘油酯異常、身體質量指數過重、總膽固醇異常且帶 5G5G 基因型者,罹患高血壓的危險性較基因型為 4G4G 或 4G5G 者高。有高血壓家族史者罹患高血壓的危險性為無家族史者的 2.31 倍,基因型為 5G5G 且有高血壓家族史者,罹患高血壓的危險性較基因型為 4G4G 或 4G5G 者高。調整 PAI-1 基因型及其它因子後,女性血漿中 PAI-1 濃度顯著高於男性。隨著單甲基砷酸百分比的增加,PAI-1 濃度會隨之增加,而隨著高密度脂蛋白或雙甲基砷酸百分比的增加,PAI-1 濃度卻會隨之遞減。尿液甲基化物種百分比與高血壓間無顯著相關性。本研究與過去非烏腳病盛行地區的高血壓盛行率相比,可發現烏腳病盛行地區的高血壓盛行率高於非烏腳病盛行地區。身體質量指數與脂質對高血壓的影響很深,若先天具易感性基因型的人,後天又暴露於高危險性的環境,罹患疾病的危險性將增加。

關鍵字：砷、纖維蛋白溶酶原活化物第一型抑制物、高血壓

英文摘要

To examine the relationship among plasminogen activator inhibitor type-1 (PAI-1), arsenic methylation capability and hypertension. The study subjects were recruited from community health examination of Budai Township of Chayi County in southwestern Taiwan. A standardized personal interview based on a structural questionnaire was carried out by the well-trained interviewers. Information obtained from interview included demographic characteristics, cigarette smoking and alcohol

drinking, residential history, history of well water consumption , personal and family disease history. There are 300 study subjects who gave their consent were recruited for blood and urine samples. DNA was extracted from buffy coat to analyze the PAI-1 4G/5G polymorphism utilizing polymerase chain reaction (PCR). PAI-1 antigen was assayed by enzyme-linked immunosorbent assays (ELISA). Urine samples of these subjects were examined by high-performance liquid chromatography to separate arsenite (AsIII), arsenate(AsV), monomethylarsonic acid (MMA), and dimethylarsinic acid (DMA) and then quantified by hydride generator combined with atomic absorption spectrometry. Body mass index, blood pressure, triglyceride, low-density lipoprotein and total cholesterol levels were all significantly associated with hypertension after adjusting for age and sex. The subjects with 4G4G or 4G5G genotypes had lower risk of hypertension than whom with 5G5G genotype and the odds ratio was 0.70 after age and sex adjustment. No matter triglyceride ≥ 200 mg/dL or BMI ≥ 24 kg/m² or cholesterol ≥ 240 mg/dL , subjects with 5G5G genotype, the risk of hypertension was higher than that of 4G4G or 4G5G genotypes. Subjects with family history of hypertension had higher risk of hypertension than those without history. After adjusting PAI-1 genotype and other factors, women had significantly higher plasma PAI-1 level than men. PAI-1 level was positively associated with MMA percentage, but negatively associated with DMA percentage and HDL. The arsenic species in urine were not associated with hypertension. The prevalence of hypertension in this study was higher than non-arseniasis-hyperendemic area, that was consistent with our former study. BMI and lipid were significant portion of risk factors of hypertension in this study. It suggested that the subjects with susceptible gene of hypertension and exposed acquired environment factors might increase the risk of hypertension.

Keywords : Arsenic, Plasminogen activator inhibitor type-1, Hypertension