染料廠員工血漿中微量營養素與脫落泌尿上皮細胞週期之相關研究

A Study on the Association of Plasma Micronutrients and the Exfoliated Urothelial Cell Cycle in Dye Workers

中文摘要

台灣染料的製造已有三十年以上的歷史，過去染料製造的主要原料或其中間物質多以聯苯胺爲主。研究顯示暴露於聯苯胺下可能導致系統性健康的危害，甚至有致癌的危險。目前已被 EPA、IARC 等機構列爲致癌物質，而膀胱癌則爲目前所知聯苯胺最易誘發之癌症，其潛伏期約爲 18 至 25 年之久。微量營養素如維生素 A、維生素 E、α—胡蘿蔔素、β—胡蘿蔔素及蕃茄紅素與微量元素如硒等已被認爲與癌症的預防有關，其抑制機轉可能與其抗氧化能力、抑制細胞增生及促進細胞分化等功能有關。又由以往本實驗室研究顯示，膀胱癌患者或泌尿上皮系統病變者其泌尿上皮細胞中屬非倍數者之比例確有偏高之現象，且顯示出與染料製造廠員工之職業暴露程度亦有相關，故本研究測定染料廠員工血漿中微量營養素，以瞭解其對職業暴露所產生之泌尿上皮細胞非倍數體百分比的增加是否具有修飾作用，並據此作爲未來高危險職業暴露者預防膀胱癌發生的參考。研究結果發現在微量營養素與研究個案 G0G1 異常值的比較方面，發現血漿中硒濃度較高之一組(≧120μg/L)似乎比濃度較低之一組有較少之異常值，維生素 A、維生素 E 及β-胡蘿蔔素亦然，但都未達統計上顯著差異。而在與 S 值比較方面，亦同樣有此趨勢存在。在高暴露組方面，則以硒及α-胡蘿蔔素對其 G0G1 值有保護作用存在，且兩者間具交互作用，並達顯著意義。

英文摘要

In Taiwan, the dye manufacturing industry has been developed for thirty years, and benzidine-based dyes were one of the major products prior to 1992. Previous studies have shown that exposure to benzidine might affect human health, particularly might further induce bladder cancer. Therefore, benzidine has been classified as human carcinogen by IARC and EPA.Several studies have presented that some micronutrients, such as Vitamin A, Vitamin E, α-carotene, β-carotene and lycopene, have been identified as anticancer agents. Their known functions including antioxidation, inhibition of cell proliferation, and promotion of cell differentiation, might play a important role on carcinogenicity as well as another one trace element, selenium. Our previous data have shown that patients with bladder cancer or urogenital system diseases have highly abnormal proportion of aneuploidy in their urothelial cells. In addition, we also found that occupational exposure level of dye workers was positively associated with analysis on their urinary epithelium cell cycle.Based on our previous data, we further investigated their plasma micronutrients levels were associated with abnormal aneuploidy proportion of urothelial cells in dye manufacturing

workers in our current study. The results showed that individuals with higher selenium level ($\geqq$120 μg/l) had lower abnormal G0G1 proportion than those with lower selenium level. The similar results on individuals with higher Vitamin A, or Vitamin E, or β-carotene were also observed. Although they were not reached statistical significance, when replaced G0G1 phase levels by S phase level ,the similar trends still were observed. Besides, there were a significantly protective association between selenium and α-carotene on G0G1 level. We concluded that selenium and micronutrients in plasma might be able to modify the carcinogenicity in dye -manufacturing workers.