中文題目：重金屬與蛋白尿和慢性腎臟病的關係

英文題目：Association of Heavy Metals with Proteinuria and Chronic Kidney Disease

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Background: The prevalence chronic kidney disease (CKD) is increasing annually in Taiwan. In spite of traditional risk factors, heavy metals contribute to the development of CKD. The aim of this study is to investigate the relationship between heavy metals, with proteinuria and CKD in the general population in Southern Taiwan. The interaction and synergetic effects among these heavy metals on proteinuria are also explored.

Materials and Methods: We conduct a survey for general population health who lived in Southern Taiwan between June 2016 and September 2018. A total of 7 heavy metals are measured: blood lead (Pb), urine nickel (Ni), urine chromium (Cr), urine manganese (Mn), urine arsenic (As), urine copper (Cu), and urine cadmium (Cd). Proteinuria was examined using dip-sticks test. CKD was defined as having estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73 m^2.

Results: The mean age of the 2,447 participants was 55.1 ± 13.2 years, and included 977 males and 1,470 females. Participants with high blood Pb, high urine Ni, high urine Mn, high urine Cu, and high urine Cd were significantly associated with proteinuria. The interaction between blood Pb and urine Cr, and urine Cd and Cu on proteinuria were statistically significant. Participants with high blood Pb, and high urine Cu were significantly associated with eGFR < 60 mL/min/1.73 m^2.

Conclusions: High blood Pb and high urine Cu were associated with increased risk of proteinuria and eGFR < 60 mL/min/1.73 m^2. High urine Ni, Mn and Cd were significantly associated with proteinuria. Co-exposure to Cd and Cu, and Pb and Cr, may have synergistic effects on proteinuria.

Key words: heavy metals, proteinuria, chronic kidney disease