

中文題目：3D 體型測量與慢性腎病的風險：配對族群的研究

英文題目：Three-dimensional (3D) body surface measurements associated with Chronic Kidney Disease: a matched cohort study.

作者：柯佳君<sup>1</sup> 丁明國<sup>2</sup> 李進昌<sup>1,3</sup> 陳永昌<sup>1,3</sup> 許光宏<sup>3</sup> 吳逸文<sup>1,3</sup>

服務單位：基隆長庚醫院腎臟科<sup>1</sup>，基隆長庚醫院新陳代謝科<sup>2</sup>，長庚大學醫學院<sup>3</sup>

**Background:** Although a known association exists between metabolic disorders and body measurements, such as waist circumference and BMI, an accurate and comprehensive method for determining such a relationship has not yet been described. This study examines three-dimensional (3D) body surface measurements associated with Chronic Kidney Disease (CKD) in a matched cohort.

**Methods:** The study enrolled 109 CKD patients from Department of Nephrology, Chang Gung Memorial Hospital, Keelung, Taiwan. Non-CKD controls (n=126) were recruited from Department of Health Promotion and Examination. At recruitment, participants completed a questionnaire related to basic demographics, lifestyle variables, personal disease history, and family disease history. 3D body surface scanning was used to obtain 35 anatomical measurements from four body regions: the head and neck, trunk, upper limbs, and hip lower limbs. Regression analysis and Receiver Operating Characteristics (ROC) Curves were conducted to determine the best body estimate associated with CKD.

**Results:** The ROC curve discriminated: both arm and leg lengths, waist to thorax ratio, trunk surface area and head circumference were sensitive estimated for CKD diagnosis, being the trunk surface area, the best predictor for CKD phenotype (AUC: 0.789, 95% CI: 0.730-0.848, p <0.001). Consistently, high waist to thorax ratio, high trunk surface area and head circumference were associated with CKD. On the other hand, lower left arm length, right arm length, left leg length and right leg length were associated with risk of CKD.

**Conclusions:** From all different sensitivity analysis, we identified the 3D body shape phenotype associated with CKD. The findings provide insight for further search of possible biological mechanism undergoing in the anthropometric phenotype modification of CKD patients. Although, the results could not be interpreted in causal terms, we open a new horizon to design physical or therapeutic intervention to modify abnormal anthropometrics parameter of CKD patients to improve their detrimental metabolic dysregulation.

**Keywords:** Chronic Kidney Disease, community, education, metabolic syndrome, multidisciplinary, obesity.