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### THE JOINT EFFECT OF INSULIN SENSITIVITY AND PHYSICAL ACTIVITY ON THE SKELETAL MUSCLE MASS AND PERFORMANCE

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**Purpose:** European working group on sarcopenia in 2010 recommended that using gait speed, grip strength and muscle mass for diagnosis of sarcopenia. There are many well-known risk factors may lead to the occurrence of sarcopenia, such as inactivity, nutrition deficiency, neurodegenerative diseases, cachexia and endocrine disorders. But their combined effects on sarcopenia components still remain unclear. Therefore, this study aimed to explore the joint effect of physical activity and insulin sensitivity associated with skeletal muscle mass and performance in Taiwanese metropolitan elders.

**Methods:** A community-based cross-sectional survey of a sample of 1,347 elders was conducted in Taichung City, Taiwan in 2009. Among them, 844 elders with complete examination of dual energy X-ray absorptiometry, fasting blood glucose, and serum insulin level were included. Insulin sensitivity was estimated with Homeostasis Model Assessment (HOMA-IR) equation. Elders were classified into 3 groups according to tertiles of insulin sensitivity. Physical performance was assessed according to grip strength and walking speed. Physical activity status was assessed by self-reported questionnaire. Chi-square test, Student's test, and general linear model were applied for statistical analysis.

**Results:** Elders with the highest tertile of insulin sensitivity had the highest mean weight, BMI, and waist circumference; and the lowest mean weight-adjusted skeletal muscle index (SMI) than the other two groups. After multivariate adjustment, the mean height- and weight-adjusted SMI for elders in the highest tertile of insulin sensitivity were 6.7 kg/m<sup>2</sup> and 27.9%, respectively, which were significantly lower than those of elders in the lowest tertile of insulin sensitivity. Compared to physically active elders with the lowest tertile of insulin sensitivity, physically inactive elders with the highest tertile of insulin sensitivity had a significantly lower means in height-adjusted SMI, weight-adjusted SMI, gait speed, and grip strength by 0.48 kg/m<sup>2</sup>, 1.99%, 0.25 m/s, and 2.4 kg, respectively.

**Conclusion:** Our study identified significantly joint effect of physical inactiveness and low level of insulin sensitivity on decreased SMI, gait speed, and grip strength. These results suggest that physical inactiveness and insulin insensitivity potentially enhance the risk of sarcopenia in Taiwanese metropolitan elders.

**Key words:** insulin sensitivity, physical activity, sarcopenia

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### HIGH URIC ACID CORRELATED WITH HIGH BONE MINERAL DENSITY IN OLDER ADULTS

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**Objectives:** The effect of uric acid of on bone mineral density was not consistent in previous study. The purpose of the study was to examine the relationship between serum uric acid and bone mineral density in Chinese elders.

**Methods:** A total of 1,382 older adults aged 65 years and over was recruited in a community-based cross-sectional study in Taichung City, Taiwan from 2010 to 2012. Among them, 833 older adults who completed serum biomarker examination and dual energy X-ray absorptiometry (DXA) examination were enrolled in this study. Bone mineral density is measured by DXA (GE-LUNAR DPX PRO, Lunar Corporation, Madison, WI, USA) for central sites (total hip, lumbar spine, femoral neck, trochanter, and Ward's triangle). Serum uric acid concentration was analyzed by a biochemical autoanalyzer and high uric acid was defined as either having gout / hyperuricemia history or uric acid >6 mg/dl in women and >7 mg/dl in men (402 elders as normal uric acid and 431 elders as high uric acid). The information of weight, body mass index (BMI), waist, estimated glomerular filtration rate (eGFR), blood pressure, health behaviors, and comorbidities were measured.

**Results:** Elders with high uric acid had higher level of weight, BMI, waist circumference, and eGFR, and higher proportion of hypertension, gout, and hyperuricemia than those with normal uric acid. Elders with high uric acid had higher bone density in total body and femoral neck, after adjustment of age, sex, BMI, eGFR, blood pressure, medication for uric acid, and comorbidity of hypertension, hyperuricemia, and gout. The odd ratio of osteopenia was 0.70 in elders with high uric acid compared with those with normal uric acid ( $p < 0.05$ ) after adjustment of age, sex, BMI, eGFR, and blood pressure. However, after comorbidities was added into model, the effect of uric acid on bone density was disappear.

**Conclusion:** Our study demonstrates that higher uric acid is correlated with higher bone mineral density, but the effect of uric acid on osteoporosis is not observed. The longitudinal effect of uric acid on bone mineral density should be studied in future.

**Key words:** uric acid, bone mineral density