Association of Muscle Quality and Prevalence of Diabetes in Older Adults

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Purpose: Diabetes is often related to the skeletal muscle; however, studies investigating individual muscle characteristics like strength or mass on diabetes have produced mixed findings. The purpose of this study was to evaluate the association of muscle quality (MQ), a metric that reflects both muscle strength and mass, with diabetes in older adults.

Methods: This cross-sectional study included 468 older adults aged ≥65 years (mean age 72 years; 55% women) enrolled in the Physical Activity and Aging Study (PAAS). Participants were excluded if they had heart attack, stroke, or cancer in the past 5 years. MQ was defined as the ratio of the combined left and right handgrip strength maximums divided by the combined lean mass of the left and right arms (measured by DEXA). Diabetes was defined by self-report, fasting glucose ≥126 mg/dl, or taking insulin, or other diabetes medications. Logistic regression was used to calculate the odds ratios (ORs) and 95% confidence intervals (CIs) of diabetes among sex-specific tertiles (thirds) of MQ. Covariates included sex, age, smoking, heavy alcohol consumption, body fat percentage, hypertension, hypercholesterolemia, and physical activity (daily steps).

Results: Forty-five (9.6%) participants had diabetes. Compared to the lower third of MQ, the middle and upper thirds had 0.53 (026-1.07) and 0.25 (0.11-0.61) times lower odds of diabetes after adjusting for age and sex (model 1); 0.58 (0.28-1.21) and 0.26 (0.11-0.66) times lower odds of diabetes after adjusting for body fat percentage, smoking, heavy alcohol consumption, and physical activity (model 2); and 0.60 (0.28-1.25) and 0.28 (0.11-0.71) times lower odds of diabetes after adjusting for all confounders including hypertension and hypercholesterolemia (model 3). There was an inverse linear trend between MQ tertiles and diabetes (p=0.02).

Conclusions: Higher MQ was associated with a reduced likelihood of diabetes in older adults. MQ could be an indicator of diabetes, but future prospective studies are needed.