Lack of Independent Relationship between Normal Aging-Related Kidney and Cardiac Diastolic Function Declines in a Healthy Chinese Population

Objectives
Decline of normal, aging-related kidney function is an independent predictor for cardiovascular events and death. However, the relationship between normal aging-related kidney function decline within the normal range and cardiac diastolic function in healthy Chinese populations is unknown.

Methods
We evaluated the relationships between estimated glomerular filtration rate (eGFR) as well as serum cystatin C (CYSC) and cardiac systolic and diastolic function in a population-based, cross-sectional sample of 852 adults (free from cardiovascular disease with eGFR >60 ml/min/1.73 m²) aged 30–98 years from Shenyang, Dalian and Beijing in China. eGFR was estimated using the modification of diet in renal disease (MDRD) equation. All subjects were divided into four groups according to the quartiles of CYSC. Cardiac diastolic function was measured by ratio of peak velocity of early filling to peak velocity of atrial filling (E/A), which was derived by B-mode echocardiography. In the present study, lower E/A was defined as measures under the 25th percentile of sample distribution (0.784).

Results
Both eGFR and CYSC were significantly correlated with age (eGFR: r = −0.102, p < 0.01; CYSC: r = 0.544, p < 0.01). Age was significantly associated with E/A (r = −0.381, p < 0.01). Binary logistic regression analysis revealed that second, third and fourth quartile groups of CYSC were associated with lower E/A in an unadjusted model with ORs of 2.49 (1.403–4.419), 4.177 (2.368–7.37), and 7.614 (4.387–13.217), respectively. However, this association was lost after full adjustment. eGFR was only associated with lower E/A in group IV (fourth quartile; 2.058, 95% CI 1.3 to 3.258) in an unadjusted model, and this association was lost after age adjustment.

Conclusions
We conclude that aging is a major factor contributing to declines in kidney and cardiac diastolic function in a healthy population but there is no independent relationship between normal aging-related kidney and cardiac diastolic function declines.