



Unfavorable serum uric acid level change is associated with the progression of cardiometabolic multimorbidity among Chinese middle-aged and elderly adults

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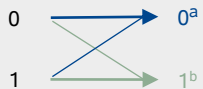
Introduction

- **Cardiometabolic multimorbidity (CMM)** is the co-existence of more than one of diabetes (DM), heart disease, and stroke.
- The relationship between serum uric acid (SUA) level and risk for heart disease and stroke (CVD) is controversial.
- Far less is known about the roles of SUA level change in the progression of CMM.
- **Objectives:** To investigate the association of SUA level change and the progression of CMM.
- Data is from the China Health and Retirement Longitudinal Study (**CHARLS**).

Methods

Statistical analysis: multivariable logistic regression

SUA level change



1: High SUA (HUA)
0: Non-HUA
a: favorable change
b: unfavorable change

Incidence of individual cardiometabolic disease

- **Progression of CMM**
Progression: 0-2 0-3 1-2 1-3 2-3
Non-progression: 0-0 0-1 1-1 2-2 3-3
0 1 2 3: number of conditions

Progressions of different CMM combination

Exposure (SUA level change) → Outcome

2011 2015 2018

17708
participants
from CHARLS
followed from
2011 to 2018

Results

	No. and % of case	Model 1 ^a	Model 2 ^b
Individual cardiometabolic diseases			
DM	237 (4.9)	2.19 (1.54,3.14)	1.87 (1.22,2.85)
Heart disease	324 (6.7)	1.40 (0.98,2.00)	1.32 (0.87,2.00)
Stroke	296 (5.6)	1.77 (1.26,2.49)	1.42 (0.95,2.14)
Cardiometabolic multimorbidity			
Progression	311 (6.5)	1.76 (1.27,2.45)	1.61 (1.11,2.34)
Different CMM combination			
DM only	237 (4.9)	2.19 (1.54,3.14)	1.87 (1.22,2.85)
CVD only	477 (9.9)	1.18 (0.88,1.59)	1.10 (0.78,1.53)
DM to CVD	306 (6.3)	2.10 (1.52,2.92)	1.68 (1.05,2.69)
CVD to DM	76 (1.6)	1.60 (0.83,3.08)	1.41 (0.66,3.00)

^a Adjust for age and sex.

^b Adjust for demographic and socioeconomic factors, health behaviors, history of chronic conditions, and physiological biomarkers.

Incidence of individual cardiometabolic diseases

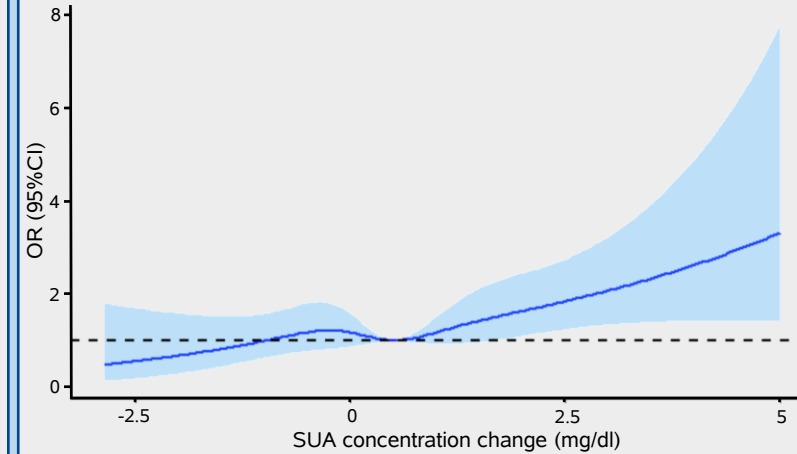
Unfavorable SUA level change was associated with increased odds of individual cardiometabolic diseases. Particularly, the odds for incidence of **diabetes** was **1.87** (95% CI: 1.22, 2.85) compared with participants with favorable change in fully adjusted model.

Progression of CMM

The odds for progression of **CMM** was **1.61** (95% CI: 1.11, 2.34) among individuals with Unfavorable SUA level change, compared with participants with favorable change of SUA level.

Progressions of different CMM combinations

Unfavorable SUA level change was associated with increased odds for all CMM combinations. Particularly, the odds for pattern of **diabetes only** and **CVD followed-by diabetes** were **1.87** (95% CI: 1.22,2.85) and **1.68** (95% CI: 1.05,2.69).



Progression of CMM

Restricted cubic splines showed a **linear relationship** between progression of CMM and SUA level change on a **continuous scale**, and increase in SUA level was associated with an **increased odds** of progression of CMM at concentration change > 0.5 mg/dl.

Conclusion

- Unfavorable serum uric acid level change is associated with the progression of cardiometabolic multimorbidity among Chinese middle-aged and elderly adults.
- Further studies on the mechanisms for diabetes in the progression of CMM are needed.



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