

The Association of Serum Uric Acid and Muscle Strength in Korean Adults: Data from 6th KNHANES

¹경상대학교 의과대학 내과학교실, ²경상대학교 병원 정형외과

*최정윤¹, 김민교¹, 이상일¹, 유준일², 천윤홍¹

Background/Aims: Previous studies indicated that uric acid (UA) may protect muscle function or relate with muscle strength loss. In this study, we determined the association of serum UA concentration with muscle strength in Korean adults. **Methods:** This study is a cross-sectional study using the data from the 6th Korean National Health and Nutrition Examination Survey. We enrolled participants who measured uric acid and hand grip strength (GS) which reflects the status of muscle strength, and excluded participants who had renal failure, malignancy, and were in bed ridden state. UA levels were divided into quartiles based on the distribution: Q1: <4.0 mg/dL (*n*=1,062), Q2: 4.0-4.9 mg/dL (*n*=1,340), Q3: 5.0-5.9 mg/dL (*n*=1,208), Q4: > 6.0 mg/dL (*n*=1,223). GS was measured three times for each dominant hand. **Results:** A total of 4,833 participants (male, *n*=2,229 and female, *n*=2,604) were finally selected (Figure 1). UA levels showed a linear trend with GS (Figure 2A). In the case of male participants, UA levels were positively correlated with muscle strength (mean GS and 95% CI: Q1, 34.6 [33.24-35.87]kg; Q2, 35.8 [34.78-36.75]kg, Q3, 36.8 [36.15-37.44]kg, Q4, 37.6 [37.03-38.09]kg, *P* <0.001) (Figure 2B). UA levels showed an inverted J-shaped association with grip strength in females (mean GS and 95% CI: Q1, 21.6 [21.17-21.95]kg; Q2, 22.1 [21.70-22.41]kg, Q3, 21.7 [21.15-22.20]kg, Q4, 20.6 [19.64 - 21.46]kg, *P* =0.011) (Figure 2C). After adjustment for potential confounders (age, gender, alcohol, smoking, body mass index, cholesterol, C-reactive protein, creatinine, intake of carbohydrate), the results data was analyzed and were as follows. **Conclusions:** Serum UA level (quartiles) showed a linear trend in men and an inverted J-shaped association in females in Korea. Further studies should be performed to clarify the reasoning of gender difference and the causality of the relationship between UA level and muscle strength.

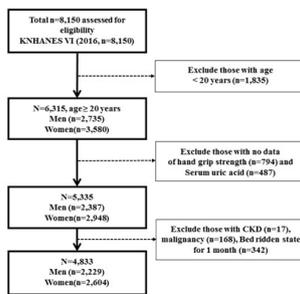


Figure 1. Flow sheet for Participant selection

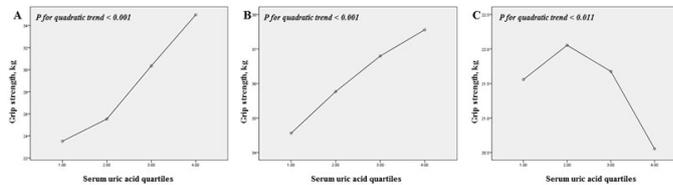


Figure 2 The association between serum uric acid and muscle strength. Serum uric acid levels were divided into quartiles based on the distribution: Q1: <4.0 mg/dL (*n*=1,062), Q2: 4.0-4.9 mg/dL (*n*=1,340), Q3: 5.0-5.9 mg/dL (*n*=1,208), Q4: > 6.0 mg/dL (*n*=1,223).