

Chronic Kidney Disease after Urolithiasis Treated Successfully by Shock Wave Lithotripsy Is Strong Risk Factor for Cardiovascular Disease

Introduction and Objective: We have reported that urolithiasis even treated by Shock wave lithotripsy (SWL) caused chronic kidney disease (CKD) after long follow-up. CKD is now well known as a strong risk factor of cardiovascular disease (CVD), but it is still unclear whether the CKD caused by urolithiasis associate with CVD. Therefore, we investigated the estimated GFR of patients treated by SWL after long-term follow-up and the association between CKD caused by urolithiasis and CVD.

Materials and Methods: Two hundred and one patients with urolithiasis (renal calculi: n=102, ureteral calculi: n=99) were treated by SWL with MPL-9000 or Lithotripter D (Dornier Medical Systems) between 1994 and 2005. They were followed up by consistent laboratory examination even after being stone-free and investigated their CVD-related health history such as myocardial infarction (MI), angina pectoris (AP) and hypertension (HT). Estimated GFR was calculated by the formula specified for Japanese by Japanese Society of Nephrology in 2008.

Results: Mean age at SWL was 56.4 ± 11.3 years old. During a mean of 9.8 ± 3.8 years of follow-up, eGFR was significantly reduced (75.9 ± 19.6 to 63.8 ± 21.6) and the mean annual change in eGFR of the patients was -1.21 ± 1.91 mL/min/1.73 m²/year, which is much larger than Japanese standard change in eGFR (-0.4 mL/min/1.73 m²/year). The ratio of CKD stage more than 3 is 46%, which is approximately 2.5-fold higher than that of standard adult Japanese (19%). CVD-related health history was found in 12 of AP/MI and 69 of HT. The eGFR of AP/MI (+) was lower than eGFR of AP/MI (-) (49.8 ± 6.5 vs 63.7 ± 1.5 , $p < 0.05$) and the eGFR of HT (+) was also lower than that of HT (-) (54.7 ± 2.3 vs 67.1 ± 1.9 , $p < 0.01$). AP/MI was more prevalent in CKD (+) than in CKD (-) (OR 6.96; 95% CI: 1.48 - 32.6) and HT was also more prevalent in CKD (+) (OR 6.05; 95% CI: 3.18 - 11.5).

Conclusions: Our findings suggest that urolithiasis even treated successfully by SWL caused CKD, which is strong risk factor for CVD and HT.