

## 제2형 당뇨병 환자에서 고정상 알부민뇨와 무증상 동맥경화증과의 관계

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### High Normal Albuminuria is associated with Arterial Stiffness and Carotid Atherosclerosis in Patients with Type 2 Diabetes

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**Background and aims:** Current evidence suggests that high normal albuminuria is significantly associated with increased cardiovascular risk. This study investigated the association between urine albumin-to-creatinine ratio (ACR) within the normal range and subclinical atherosclerosis in Korean patients with type 2 diabetes.

**Methods and results:** This cross-sectional study involved 521 type 2 diabetic patients with normoalbuminuria. Brachial-ankle pulse wave velocity (baPWV) measurement and ultrasound assessment of carotid atherosclerosis was done. Subclinical atherosclerosis was assessed by the presence of high baPWV (>1682 cm/s), carotid atherosclerosis (intima-media thickness >0.8 mm or the presence of plaques), and carotid stenosis (≥50% of luminal narrowing). The subjects were stratified into tertiles according to ACR, and the relation between ACR and subclinical atherosclerosis was analyzed. Across the tertiles of ACR, there was a trend for an increasing prevalence of high baPWV (16.8%, 20.0%, and 38.2%, p<0.001), carotid atherosclerosis (46.9%, 55.4%, and 64.7%, p<0.001), and carotid stenosis (12.7%, 16.0%, and 30.1%, p<0.001). In multivariate analysis, patients in the highest ACR tertile had an odds ratio of 2.05 (95% confidence interval [CI], 1.13-3.72, p=0.019) for high baPWV, 1.78 (95% CI, 1.08-2.93, p=0.024) for carotid atherosclerosis, and 2.72 (95% CI, 1.44-5.11, p=0.002) for carotid stenosis compared to those in the lowest tertile. The relation remained significant even in patients without diabetic retinopathy.

**Conclusion:** High normal albuminuria was significantly associated with atherosclerotic vascular changes, independent of retinopathy and other cardiovascular risk factors. High normal albuminuria may be an early marker for subclinical atherosclerosis in type 2 diabetes.

**Key Words:** 알부민뇨, 동맥경화증, 제2형 당뇨병  
Albuminuria, Atherosclerosis, type 2 diabetes