Clinical Value of the Urinary Albumin-to-Creatinine Ratio Measured Using a Strip Test in Prediabetes

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Introduction: Albuminuria is generally known to be a sensitive marker of renal and cardiovascular dysfunction. It provides a clue for helping to predict the occurrence of nephropathy and cardiovascular disorders in diabetes. Individuals with prediabetes have been reported to have a tendency to develop macrovascular and microvascular pathology, resulting in an increased risk of retinopathy, cardiovascular disease, and chronic renal disease. This study was performed to evaluate the clinical value of a strip test for measuring the urinary albumin-to-creatinine ratio (ACR) in prediabetes.

Methods: Spot urine samples were obtained from 226 prediabetic and 275 diabetic subjects during routine health checkups. The urinary ACR was measured using strip and laboratory quantitative tests.

Results: The prevalence rates of albuminuria in this study as measured using the ACR strip test were 15.5% (microalbuminuria, 14.6%; macroalbuminuria, 0.9%) and 30.5% (microalbuminuria, 25.1%; macroalbuminuria, 5.5%) in prediabetes and diabetes, respectively. In the cases with prediabetes, the sensitivity, specificity, and accuracy of the ACR strip test for detecting albuminuria were 92.0%, 94.0%, and 93.8%, respectively. The positive and negative predictive values of the strip test were 65.7% and 99.0%, respectively. The median [25th–75th percentiles] ACR values in the strip tests for measurement ranges of <30, 30–300, and >300 mg/g were 9.44 [6.27–15.45], 46.94 [26.49–87.68], and 368.79 [296.23–575.24] mg/g, respectively when using the laboratory method.

Conclusion: The ACR strip test had a high sensitivity, specificity and, negative predictive value, which suggests that the test can be used for screening albuminuria in cases of prediabetes.

Keywords: Albuminuria, Albumin-to-creatinine ratio, Prediabetes, Strip test