

Title	Albumin (or protein) to creatinine ratios in the diagnosis of chronic kidney disease in adults
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Aim

The objective of this study was to compare the diagnostic performance of albumin creatinine ratio (ACR) (or protein creatinine ration (PCR)) from a spot urine sample with albuminuria (or proteinuria) and from a 24-hour urine collection in the detection of significant albuminuria (or proteinuria), and to determine whether urine spot samples could replace 24-hour urine collection to detect albuminuria or proteinuria for early diagnosis of chronic kidney disease (CKD) in adult patients at increased risk of kidney disease.

Conclusions and results

The identified guideline National Institute for Health and Care Excellence (NICE) recommends detection of urinary protein excretion rate with ACR or PCR using a spot urine sample instead of 24-hour urine collection. The literature identified in this report does not invalidate the NICE conclusion. Correlation of ACR and PCR from (spot) urine samples with 24-hour albuminuria or proteinuria was high for CKD patients. The areas under the ROC curve, always close to 1, demonstrate the excellent discriminatory power of ACR or PCR in the detection of albuminuria or proteinuria.

The PCR sensitivity in the detection of proteinuria above 500 mg/24 h was at least 91% with specificities greater than 85%. The positive likelihood ratios were higher than 6.

The sensitivity of ACR in the detection of albuminuria above 300 mg/24 h was 100% (ACR threshold: 30 mg/mmol) with at least a 78% specificity (ACR threshold: 70 mg/mmol). The positive likelihood ratios were higher than 15.

In patients with diabetes, the ACR sensitivity in the detection of microalbuminuria was at least 88% (ACR threshold less than 2.25 mg/mmol).

Literature data conclusions:

For screening, ACR and the PCR on spot urine sample showed sufficient diagnostic performance and may replace 24-hour urine collection.

Recommendations

For screening (patients at increased risk)

- The urinary albumin (or protein) excretion rate should be investigated using a random spot urine sample (very

good diagnostic performance and can replace 24-hour urine collection);

- 24-hour urine collection is unnecessary.

The result must be expressed

- as protein to creatinine or albumin to creatinine ratio; and
- using SI units.

Methods

Critical analysis of published data from 01/2000 to 09/2011 was carried out, after querying the Medline, Pascal and Cochrane Library databases. One guideline meeting the AGREE methodological criteria and three studies were analyzed. The results of this analysis were discussed by a multidisciplinary working group comprising four nephrologists, four clinical pathologists, two geriatricians, one endocrinologist, one radiologist, one anesthetist, one engineer, one cardiologist and one generalist physician. Conclusions have been reviewed by the National Committee for the Assessment of Medical Devices and Health Technologies, the HAS specialised appraisal committee.

Further research/reviews required

It would be useful to clarify the respective roles of ACR and PCR in non-diabetic patients.

Written by

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