

Reference range (% of total hemoglobin):

Microalbumin 0-3 mg/dl

Albumin Creatinine Ratio (ACR) 0-30 mg/gm CR

Methodology:

Immuno-turbidimetric

Specimen required:

Urine

Stability:

28 days

Background

The National Kidney Foundation estimates that over 26 million individuals currently have chronic kidney disease (CKD). High risk groups include those with diabetes, hypertension and family history of kidney failure. Persistent proteinuria, or protein in the urine, is an indicator that CKD is present.

Microalbumin Defined

Albumin represents 55-65% of the total plasma proteins. Normally, most of the albumin in the glomerular filtrate is resorbed; however, small amounts may be found in the urine.

Excretion increases with altered glomerular pore size, charge selectivity, and/or tubular impairment. In glomerular disease far larger amounts of albumin may be secreted than in tubular disease. Urinary albumin is the most important marker for glomerular dysfunction. In the early stages of renal vascular disease, albumin usually precedes frank proteinuria. Slightly elevated albumin excretion in urine is called microalbuminuria. In spite of the name, the albumin is identical to serum albumin. It is of particular importance in the early diagnosis of diabetic nephropathy that develops in nearly 40% of diabetics. Microalbuminuria is also the harbinger of renal failure in hypertension and polycystic kidney disease.

Correlation and Study Results

In patients with diabetes or hypertension, elevated albuminuria is independently associated with an increased risk of all mortality, cardiovascular morbidity and mortality, and renal insufficiency.⁽¹⁾

The Kidney Disease: Improving Global Outcomes (KDIGO) 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease (CKD) recommend that CKD is classified based on cause, GFR category, and albuminuria. They highly recommend that albuminuria be reported as urine albumin-to-creatinine ratio (ACR) for greater accuracy.

Recommended Testing Guidelines

Applicants between the ages of 12 and 70 with Type 1 and Type 2 diabetes should have a urine test completed at least once per year for albuminuria. Current guidelines recommend screening for albuminuria in individuals with the following CKD risk factors:

- Diabetes
- High blood pressure
- Systemic illness
- Age of greater than 60 years
- Family history of kidney failure

References

- (1) Yuyan, M et al; Microalbuminuria independently predicts all-cause and cardiovascular mortality in a British population: The European Prospective Investigation into Cancer in Norfolk (EPIC-Norfolk) population study; [International Journal of Epidemiology](#), Volume 33, Issue 1; Pp. 189-198.