Microalbumin (Albumin), Urine

Analyte: Albumin

Specimen Type: Urine (unpreserved)

Optimum Volume: 0.5 mL

2-8°C	-20°C	-70°C
1 month	6 months	1 year

Reporting units: mg/L; ug/mg (normalized)

Method: Immunoturbidimetric

Biological or Clinical Significance:

Albumin is a non-glycosylated protein with a molecular weight of 66,000 daltons. It is synthesized in liver parenchymal cells at a rate of 14 g/day. Quantitatively, albumin is the most important protein component (over 50%) in plasma, CSF and urine. A small, but abnormal albumin excretion in urine is known as microalbuminuria. Causes of microalbuminuria can be glomerular (e.g. due to diabetic microangiopathy, hypertension, minor glomerular lesion), tubular (inhibition of reabsorption) or postrenal. Albumin is also a marker protein for various forms of proteinuria. In selective glomerular proteinuria, 100-3000 mg albumin/g creatinine is excreted. Non-selective glomerular proteinuria is characterized by elevated excretion of high-molecular weight proteins (IgG more than 10% of the albumin value). Prerenal proteinuria is recognized by a discrepancy between albumin and total protein (albumin accounting for less than 30%). Simultaneous elevation of albumin and microproteins is found in glomerulotubular proteinuria occurring due to overloading of tubular reabsorption in glomerulopathy (e.g. nephrotic syndrome), combined glomerular tubulointerstitial nephropathy or in renal failure following diabetic nephropathy or other causes (overflow proteinuria). Albumin has two main functions in plasma: maintaining the oncotic pressure (80% due to albumin in plasma) and transport. It is the most important transport protein for substances having low water solubility (such as free fatty acids, bilirubin, metal ions, hormones and pharmaceuticals). Decreased albumin levels are caused by hyperhydration, hepatocellular synthesis insufficiency, secretion disorders in the intravascular space, abnormal distribution between the intravascular and extravascular space, catabolism and loss of albumin, acute phase reactions, and congenital analbuminemia. Since urinary albumin excretion is affected by factors such as erect posture, exercise, and acute dieresis, the method of sample collection should be standardized when screening and monitoring patients. The determination of the urinary albumin to urinary creatinine ratio is a more accurate measurement of albumin excretion, since it corrects for variations in urine volume. This measurement can be performed on a single random urine sample and has shown a strong correlation with the 24 h urinary albumin loss.

Principle of Test Method:

The urine albumin assay is an automated immunoturbidimetric assay. Microalbumin is reported as a normalized ratio to urinary creatinine in order to account for variations in urine flow rate. Therefore microalbumin and urine creatinine are preferably tested from the same aliquot.