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Title **Systematic Review on Urine Albumin Testing for Early Detection of Diabetic Complications**

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Aim

To assess the evidence on microalbuminuria (MA) as an independent prognostic factor for diabetic complications in patients with type 1 or type 2 diabetes mellitus (DM); and, in subjects with type 1 or type 2 DM and MA, assess whether improved control of glycemia or blood pressure influences diabetic complications more than in patients without MA.

Conclusions and results

The complications assessed were: mortality, the development and progression of retinopathy, and development of renal failure. Patients with type 1 or type 2 DM and MA have a relative risk (RR) of all-cause mortality of 1.8 (see report for confidence intervals) and 1.9 respectively. Similar RR's were found for other mortality endpoints, with age of cohort being inversely related to the RR in type 2 DM. In patients with type 1 DM, there is evidence that MA or raised albumin excretion rate has only weak, if any, independent prognostic significance for the incidence of retinopathy and no evidence that it predicts progression of retinopathy, although evidence is strong for the independent prognostic significance of MA or raised albumin excretion rate in the development of proliferative retinopathy. For type 2 DM, there is no evidence of any independent prognostic significance for the incidence of retinopathy and little, if any, prognostic relationship between MA and the progression of retinopathy or development of proliferative retinopathy. In patients with type 1 DM and MA there is an RR of developing end-stage renal disease (ESRD) of 4.8 and a higher RR (7.5) of developing clinical proteinuria, with a significantly greater fall in glomerular filtration rate (GFR) in patients with MA. In patients with type 2 DM, similar RR's were observed. In adults with type 1 or type 2 DM and MA at baseline, the numbers progressing to clinical proteinuria and those regressing to normoalbuminuria did not differ significantly. In children with type 1 DM, regression was significantly more frequent than progression. In patients with type 1 or type 2 DM and MA, there is scarce evidence as to whether improved glycemic control has any effect on the incidence of cardiovascular disease (CVD), the incidence or progression of retinopathy, or the development of renal complications. However, among patients not stratified by albuminuria, improved glycemic control benefits retinal and renal complications and may benefit CVD. In the effects of angiotensin-converting enzyme (ACE) inhibitors on GFR in normotensive MA patients with type 1 DM, there was no evidence of a consistent treatment effect. There is strong evidence from 11 trials in normotensive type 1 patients with MA of a beneficial effect of ACE inhibitor treatment on the risk of developing clinical proteinuria and on the risk of regression to normoalbuminuria. Patients with type 2 DM and MA may gain additional cardiovascular benefit from an ACE inhibitor, and there may be a beneficial effect on the development of retinopathy in normotensive patients irrespective of albuminuria. (See full report for additional findings.)

Recommendations

See Executive Summary link above.

Methods

See Executive Summary link above.

Further research/reviews required

Recommendations for microalbuminuria research include: determining rate and predictors of development and factors involved in regression; carrying out economic evaluations of different screening strategies; investigating the effects of screening on patients; standardizing screening tests to enable use of common reference ranges; evaluating the effects of lipid-lowering therapy; and using to modulate antihypertensive therapy.

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