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REVIEW

Microalbuminuria, renal disease, metabolic syndrome and risks in diabetes

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Abstract Microalbuminuria was identified as an important predictor of renal disease as well as of cardiovascular disease about 20 years ago. This concept has been confirmed in many studies, and it has been shown that microalbuminuria is associated to the metabolic syndrome. Microalbuminuria is an important risk marker along with a series of other markers and factors. It is associated to a structural damage in the kidney, and a loss of auto-regulation and inflammation.

It is a predictor of proteinuria, low GFR and cardiovascular events as well as of end-stage renal disease and mortality, including cardiovascular mortality.

Microalbuminuria is an important goal for intervention. Several studies have shown that reduction of microalbuminuria indicates a better prognosis. The reason is not clear but may be associated to less structural damage in patients that show regression in microalbuminuria. It is recommended to screen for microalbuminuria in diabetic patients with hypertension and may be in the population, although this is less clarified.

Contents

Background

Diabetic patients are at considerable risk of either having or developing renal disease and/or related cardiovascular diseases, usually starting with microalbuminuria often related to insulin resistance (or metabolic syndrome) [1–3]. In most cases, glomerular filtration rate (GFR) is well preserved in such patients, but according to recent reports GFR may also be decreased even in patients with normoalbuminuria, especially in type 2 dia-

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betes microalbuminuria remains, however, an important risk factor and a signal for intervention, which is not documented for patients with isolated reduced GFR in diabetes [4]. Yuyun et al. [2] reviewed and confirmed the evidence that microalbuminuria is a predictor of cardiovascular disease and mortality. It may be proposed that in the future, risk factor prediction charts for heart disease and cardiovascular events should include microalbuminuria as a risk factor being modifiable by intensive multifactorial intervention, also related to metabolic syndrome. This means that the department of diabetes, internal medicine, and cardiology should screen for microalbuminuria [4,5]. In addition, however, the suggestion has been put forward recently that future screening for renal disease in diabetes should also include screening for reduced GFR. From a practical point of view, large-scale screening is only possible by screening for serum creatinine and derived parameters, and intervention strategies are not by any means established. Clearly, antiglycemic treatment is essential, since hyperglycaemia is a key factor in the genesis of complication.

As shown in the DIGAMI 2 study [6] in high-risk patients (with myocardial infarction), it is BG-lowering that is of importance; e.g. patients treated with SU seemed to have a lower risk than patients on insulin.

Microalbuminuria/proteinuria: screening, pathophysiology and predictive studies

Adler et al. recently confirmed that microalbuminuria strongly predicts early mortality in diabetes, and proteinuria is clearly associated with even greater risk very much in agreement with my original observation from 1984 [4,7]. Microalbuminuria is as well associated with abnormalities and risk factors connected to the metabolic syn-

Table 1