Pitfalls of the Urinary Albumin Creatinine Ratio in Detection of Early Diabetic Kidney Disease

Abstract:
Diabetic Kidney Disease (DKD) is the leading cause of kidney disease worldwide, for which albuminuria is the currently accepted biomarker. Despite the increased use of glucose-lowering medications and renin-angiotensin-aldosterone system (RAAS) inhibitors, prevalence of DKD continues to rise in proportion to the prevalence of diabetes. Development of chronic kidney disease in patients with diabetes is associated with a significant morbidity and mortality, as well as healthcare costs, even before the development of end stage renal failure (ESRF), and its onset can be clinically silent. Microalbuminuria (MA) was established as the primary predictor of risk for the advanced stages of DKD based on three renal biopsy. They may also have a reduced GFR, and this can be associated with more advanced glomerular lesions despite long-standing normal urinary albumin excretion, have well established pathological changes of DKD shown by level of the individual patient, a fact that should be considered in day to day clinical practice. T1DM patients, while microalbuminuria reliably reflects DKD across the disease population this does not necessarily hold true at the level of the individual patient, and should be considered in the context of the natural history of MA. It is important to be aware of the limitations of using uACR in predicting development and progression of DN, particularly as our understanding of the natural history of microalbuminuria has evolved. Since the risk of remission of MA outweighs the risk of progression, MA can no longer be seen as the independent predictive marker for DN. This new model of DN demands that emphasis be placed on research into better biomarkers that could identify those at risk of DKD prior to its development. Such biomarkers could enhance the prediction of the conventional markers for early nephropathy and chronic kidney disease by inclusion in a multi-variate assessment tool, or replace them. Biomarkers should be detected using an accurate, comparable and precise test with a standardised approach, which is currently not the case for uACR. Current research areas include urinary proteins, measurements of tubular function and identification of genetic markers associated with increased or decreased risk of development of DN. Although research is rapidly evolving, current progress suggests that at a clinical level we will be using uACR for some time yet and therefore efforts are required to be consistent in sample collection, analytical measurements and methods, and units and cut-offs for reporting.

A Garrahy1, W P Tormey2
1Diabetes Day Centre, Galway University Hospital, Newcastle Rd, Galway
2Department of Chemical Pathology, Beaumont Hospital, Dublin 9
Email: aolfe.garrahy@gmail.com

References
6. Perkins BA, Ficociello LH, Roshan B, Warram JH, Krolewski AS. In patients with type 1 diabetes and new-onset microalbuminuria the development of advanced chronic kidney disease may not require progression to proteinuria. Kidney international. 2010;77:57-64.