Laboratory medicine in diabetic kidney disease: challenges and perspectives

Diabetic kidney disease (DKD) is the leading cause of chronic kidney disease (CKD) and end-stage kidney disease worldwide (1). The pathogenesis is complex and involves hemodynamic, metabolic, and inflammatory pathways (2). Its diagnosis is based on increased urinary albumin and decreased glomerular filtration rate. In this context, investigations involving laboratory markers are relevant for diagnosing and monitoring patients with diabetes and DKD.

This special series on "Laboratory Medicine in Diabetic Kidney Disease" consists of three review articles, each with a different approach, but both with aspects related to the investigation of DKD. Résimont and collaborators (3) reviewed the use of urinary albumin, especially addressing preanalytical and analytical aspects related to the heterogeneity of laboratory methods, in addition to considerations about the expression of albuminuria results and their clinical relevance. The authors presented some preanalytical conditions that may contribute to increased urinary albumin excretion, including exercise, posture, pregnancy, and fever, in addition to positive urine sediment for hematuria and/or leukocyturia. Furthermore, using timed 24-hour urine samples and quantification by liquid chromatography with tandem mass spectrometry remains the gold standard for albumin quantification. However, numerous international guidelines have recommended the measurement of urine albumin to creatine ratio on a spot sample as an alternative. Immunoassays are the most used method for measuring albuminuria in clinical laboratories due to their ease of execution in daily clinical practice.

The review carried out by Poloni and Rotta (4) aimed to identify the urinalysis parameters with the potential to contribute to the diagnosis of DKD. Although patients with DKD may have alterations such as glycosuria and proteinuria, these findings are not specific for diagnostic purposes. Acanthocytes and podocytes in the urinary sediment can provide important information in investigating DKD. However, there is no evidence to demonstrate the association between DKD and the presence of any particular structure in the urinary sediment. The evolution and improvement of laboratory technologies focused on identifying different types of cells in the urinary sediment may produce information that may contribute to diagnosing DKD in the future. The other review in this series investigated the usefulness and limitations of glycated albumin (GA) derived from non-enzymatic glycation between albumin and glucose as a glycaemic marker in diabetic patients with DKD (5). Chume and colleagues present evidence supporting GA as a useful glycemic marker and prognostic factor in CKD patients. However, the results of this marker should be carefully evaluated in the presence of massive proteinuria and hypoalbuminemia. In addition, there is still a need for an international consensus on the clinical and laboratory aspects related to the use of GA in clinical practice.

In summary, this series presented an overview of the use of urinary albumin in clinical practice and the main current challenges and prospects for the use of urinalysis parameters with the potential to contribute to the diagnosis of DKD, in addition to addressing aspects related to the usefulness and limitations of GA as a glycaemic marker in diabetic patients.

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