

RETINOL BINDING PROTEIN (RBP4) AS A URINARY MARKER OF SEVERITY IN CKD-u OF SRI LANKA

B. Fernando, T Hettiarachchi, C Ratnayake, N Kumarasena, R Hemade, Z Badurdeen, N Nanayakkara

¹Centre for Education, Research and Training on Kidney Diseases (CERTKiD), Faculty of Medicine, University of Peradeniya, Sri Lanka

²Nephrology and Transplant Unit, Teaching Hospital, Kandy, Sri Lanka

Introduction

Chronic Kidney Disease (CKD) is an increasing cause of morbidity and mortality worldwide. Chronic Kidney Disease of Unknown etiology (CKD-u), a tubular interstitial nephropathy, is an emerging epidemic among farmers in north central region of Sri Lanka. Serum creatinine remains unchallenged, as the marker of renal function and most appropriate test for screening. One major disadvantage of creatinine is that it remains within normal range even with 50% loss of renal function. Due to limitations of serum creatinine and other available biomarkers of CKD there is a huge demand for novel validated markers in screening and clinical care. Different urinary and serum proteins have been rigorously investigated over the past decade as possible biomarkers for early detection, diagnosis, disease progression and risk categorization and to identify complications. Retinol binding protein 4 (RBP4) is a low molecular weight protein, which is mainly synthesized in the liver belonging to the lipocalin super family. Its main function is to transport retinol (vitamin A). The role of urinary RBP4 as a biomarker of CKD in proximal tubular diseases, glomerulopathies and in transplantation is well established. Beyond the typical proximal tubulopathies, it has been shown that urinary RBP4 is associated with the risk of CKD progression in some other conditions. The aim of this study was to determine the level of urinary RBP4 as a marker of disease severity in CKD-u patients in Girandurukotte and Wilgamuwa area in Sri Lanka.

Method

Thirty nine biopsy proven CKD-u patients from Girandurukotte and Wilgamuwa renal clinics were studied. Blood and random urine samples were collected from participants and centrifuged for 15 minutes at 4000rpm. Centrifuged urine samples were frozen at -80°C until assay. RBP4 level was measured in urine by MILLIPLEX MAG CERTKD panel 05 in a Luminex MAGPIX platform. All procedures were performed in accordance with the manufacturer's instructions. Separated serum was used to measure serum creatinine and estimated glomerular filtration rate (eGFR) was calculated. The disease was categorized into five clinical stages, according to the Kidney Disease Outcomes Quality Initiative (KDOQI) criteria based on the estimated glomerular filtration rate. Data was analyzed using R statistical software.

Results

Out of 39 patients, 6 were in CKD stage 1, 12 were in stage 2, 15 and 6 were in stage 3 and 4 respectively. The median urinary RBP4 levels were stage 1- 2762.5 pg/ml, stage 2- 7238.5 pg/ml, stage 3- 50003 pg/ml and stage 4- 61198.5 pg/ml. Thus, the median urinary RBP4 levels gradually increased with the advancing clinical stage of CKD and there was a negative correlation between the eGFR and the urinary RBP4 level (-0.5362).

Conclusion

Our results suggest that urinary RBP4 could be a marker of disease severity in CKD-u patients in Sri Lanka. However, a larger control study would be needed to validate these findings.

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Keywords: Retinol Binding Protein, CKD-u, Biomarker, eGFR