ABSTRACT

Diabetic nephropathy (DNP) is a chronic kidney disease caused by diabetes that leads to end stage renal diseases. The disease is being diagnosed clinically by using microalbuminuria test, which is highly non specific. So there is a need for alternate biomarker which could specifically diagnose DNP at an early stage. In search of a novel biomarker, CD36 was identified. Since CD36 has been proven to be involved in the pathophysiology of DNP and is also upregulated with the increase in the ligand concentration, this study was designed to analyze the expression level of CD36 in both rats and humans to check if it could be used as a biomarker for DNP.

A rat model for DNP was standardized with an optimum dose of Streptozotocin without the use of insulin injection. DNP in rats were manifested histologically by the thickening of the glomerular basement membrane, mesangial expansion, macrophage infiltration, glomerulosclerosis and tubular changes such as glycosuria and proteinuria. Using Real-time PCR, increased m-RNA expression of CD36 was observed in the kidney of diabetic rats progressing to DNP. The increased m-RNA expression was further substantiated by increased CD36 protein expression in western blot and immunohistochemistry. Further, significant increase in the level of soluble CD36 in both plasma and urine was observed in diabetic rats progressing to DNP. This was further confirmed in human samples, wherein, an increased level of soluble CD36 was observed in diabetic patients with micro- and macroalbuminuria. From the results, it was concluded that CD36 could possibly be considered as a prognostic marker for DNP. In addition, aged garlic extract was identified as a novel treatment regimen and it showed significant effect on CD36 expression in preventing the progression of DNP. This further confirmed the pathological importance of CD36 in mediating the progression of DNP.