CD36 EXPRESSION LEVEL IN STREPTOZOTOCIN INDUCED DIABETIC RATS PROGRESSING TO NEPHROPATHY

Shiju Thomas Michael¹, Krishna Kanth Batchu¹, Rajesh Nachiappa Ganesh² and Pragasam Viswanathan¹

¹VIT University, Bio-Medical Research Centre, Vellore, India, ²Jawaharlal Institute of Postgraduate Medical Education Research, Department of Pathology, Puducherry, India

Introduction and Aims: The scavenger receptor CD36 has an ability to bind with advanced glycation end products (AGE) and the in-vitro studies has proven that, with the increase in AGE level there is an increased expression of CD36. Further, the involvement of CD36 in mediating the progression of diabetic nephropathy (DNP) has been well documented. But the level of expression of CD36 in kidney and the level of soluble CD36 (sCD36) in plasma and urine of diabetic rats, in different pathological stages of DNP has not yet been predicted. The aim of this study is to analyse the expression level of CD36 in kidney and to analyse the level of soluble CD36 in plasma and urine of diabetic rats progressing to nephropathy, to predict if it could be used as a prognostic marker for nephropathy.

Methods: Diabetes was induced by a single intra-peritoneal injection of Streptozotocin (45 mg/kg body weight) and the diabetic rats were allowed to progress to nephropathy for a period of nine months. At the end of every month, both serum and urine biochemical changes were analysed and the kidney histological examination was performed on H&E and PAS stained sections. CD36 protein expression in kidney was observed using immunohistochemistry and the level of expression was estimated using Western blotting. The m-RNA expression level of CD36 in the rat kidneys were analysed using Real-time PCR and the level of sCD36 in both plasma and urine was found using Sandwich ELISA.

Results: Significant change in urine and serum biochemistry such as albumin (P<0.001), protein (P<0.001), urea (P<0.001) and creatinine (P<0.001) evinced that the diabetic rats encountered kidney damage. Kidney histological examination revealed evidence for nodular glomerulosclerosis, macrophage infiltration, interstitial fibrosis and tubular changes such as glycosuria and proteinuria in diabetic rats. Though there was increased expression of CD36 in the initial stages of nephropathy, there was a drastic decrease in the expression level of CD36 in the final stages of DNP, which is attributed to the increased tubular damage. Increased level of plasma soluble CD36 with an increased expression of CD36 gene (Tenfold) was observed in the final stages of nephropathy which is accounted by the increased infiltration of macrophages. This study has reported the presence of CD36 in urine for the first time and it was observed that there was an increasing trend in the level of CD36 in urine with the severity of nephropathy.

Conclusions: Decreased expression level of CD36 in the kidney with an increased level of soluble CD36 in plasma and urine of diabetic rats progressing to nephropathy indicates that it could possibly be considered as prognostic marker for DNP.