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PTY-2, a patented herbal formulation prevents progress of diabetic nephropathy by reducing the oxidative stress

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Uncontrolled diabetes leads to many micro and macro-vascular complications including diabetic nephropathy. Broadly, its pathogenesis involves oxidative stress, inflammation and cellular apoptosis in kidney. Current evidences indicate involvement of high endoplasmic reticulum (ER) stress and low autophagy also as some of the basic causes, justifying the multi-etiological nature of its pathogenesis. Thus, we hypothesized that multi-targeted drugs would be more suitable for its management. In case of Streptozotocin-induced diabetic nephropathy in rats, we have observed low MMP activity, low expression of nephrin, high expression of NFkB, IL-6 and HIF-1 in kidney tissue. These changes have been accompanied with high ECM accumulation, glomerulosclerosis and cellular apoptosis in histological sections with reduced renal function i.e., high serum urea and creatinine and urine protein. Earlier we have reported that PTY-2, a patented semi-purified patented fraction of tubers of *Pueraria tuberosa* (*fabiceae*), shows nephroprotection through activation of MMP-9, so here have we explored its role on the modulation of HIF-1 expression. The PTY-2 is a natural cocktail of many flavones and isoflavones with antioxidant potentials, so we hypothesized that it would reduce the oxidative stress by increasing the expression of antioxidant enzymes and thereafter reducing the raised expression of HIF-1. Interestingly, PTY-2 treatment significantly reduced the expression of HIF-1 and enhanced the expression of catalase and super oxide dismutase (SOD). The CoCl2 was used as positive control as it is a standard HIF-1 inducer. These changes were accompanied with enhanced SOD and catalase activity in kidney tissue and blood. Thus, it could be concluded that nephroprotective potential of PTY-2 also involves activation of antioxidant potential in target organ, in addition to MMP-9 activation, supporting multi-targeted action.

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