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Histopathological study and immunohistochemical expression of TGF-β in the role of 4′,5′,7′ trihydroxyflavone in acute renal failure

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Acute renal failure is a major health complication today. Rhabdomyolysis is one of its etiologies and accounts for 10–15% of all acute renal failure cases. Oxidative stress is related in the pathogenesis of rhabdomyolytic acute renal failure but there is no research about the role of nitrosative stress yet. Apigenin, a bioflavonoid with strong antioxidant properties, was used in this study to investigate its effect against nitrosative stress in acute renal failure.

Adult male Sprague Dawley rats received an intramuscular injection of glycerol (10ml/kg, in saline) or vehicle for the induction of acute renal failure and treated with apigenin (30mg/kg, orally) or the vehicle.Renal dysfunction was assessed by measuring the blood urea and creatinine. Oxidative stress was measured by antioxidants, superoxide dismutase, glutathione and lipid hydroperoxide levels. Reactive nitrogen compounds, e.g. nitric oxide, nitrate-nitrite and enzyme activity of iNOS (inducible nitric oxide synthase) were measured to assess nitrosative stress.

The processed renal tissue was stained by haematoxylin and eosin (H&E) and immunohistochemistry, for estimation of Transforming Growth Factor (TGF-β) expression, a marker for renal cell injury. Glycerol administration resulted in marked oxidative and nitrosative stress ($p<0.05$). Histopathology analysis showed that histological damage and TGF- β expression were greatest in acute renal failure rats ($p<0.01$).Apigenin showed to significantly improve the oxidative and nitrosative stress and histological changes seen in the acute renal failure rats. In conclusion, the study proves that apigenin has nephroprotective effect on nitrosative stress in rhabdomyolysis-induced acute renal failure.

Biography

Associate Professor Dr Srikumar Chakravarthi is the Associate Dean of Medical Sciences in the International Medical University, Malaysia. He has 15 years of experience in academic pathology teaching and with extensive laboratory work and vast clinical experience in histopathology, haematology and clinical pathology. He has supervised numerous research projects and has published 46 full length research papers in indexed peer reviewed journals (as of Feb 2012).

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