



Ramipril blunts glycerol-induced acute renal failure in rats through its anti-apoptosis, anti-inflammatory, anti-oxidant, and renin-inhibiting properties

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Abstract:

Acute Kidney Injury (AKI) is a sudden episode of kidney failure or kidney damage that happens within a few hours or a few days and causes a buildup of waste products in the blood making it hard for the kidney to keep the right balance of fluid in the body. It affects other organs such as the heart, brain and lungs [1]. Renal tubular damage is a pathological characteristic of AKI. Currently, animal models of glycerol-induced AKI are widely used [2]. Glycerol injection into the muscle causes the release of myoglobin and other muscle contents into the circulation, ultimately resulting in AKI. Studies have demonstrated that the pathogenesis of glycerol-induced AKI involves myoglobin toxicity [3, 4], reactive oxygen species (ROS) [5], inflammation [6], apoptosis [7] and redox-active iron [5].

In this study ramipril and pioglitazone (reference drug) were evaluated for their potential therapy in glycerol-induced AKI in rats. Twenty animals divided into four groups of five animals per group were used. Group I served as control while group II received glycerol on day 8 only. Groups III and IV were administered with pioglitazone and ramipril for 7 days respectively and on day 8 received glycerol. On day 9 blood samples were collected for serum biochemical analysis of markers of oxidative stress, enzymatic and non-enzymatic antioxidants, creatinine and blood urea nitrogen. Animals were sacrificed thereafter; and kidney tissues were harvested for histopathology and immunohistochemistry. Expression of caspase 3, renin receptor, NK-KB, and KIM-1 were carried out.

Biography

Professor Adeolu Alex Adedapo, DVM, MSc, PhD FIIA FACN is of the Department of Veterinary Pharmacology and Toxicology, University of Ibadan. He has additional specialist training in the role of biotechnology in Medic-



inal Plants at the International Institute of Tropical Agriculture, Ibadan, Nigeria (2003), Advanced Leadership Training at the Haggai Institute of Leadership, Singapore (2007), Advanced Training in Renal pathophysiology techniques at the Center of Cardiovascular Diseases, Texas Southern University, Houston, TX, USA (2009-2010) and IUTOX training on environmental risk analysis with focus on water, air quality and hazardous chemical wastes in 2012. He has published in both national and international journals with over 180 publications to his credit. He is a recipient of Bassir-Thomas Biomedical Foundation award (1998); OMPADEC postgraduate award (2000); National Research Foundation of South Africa (2006-2007); UNESCO award (2008); Senior Fulbright Scholarship (2009-2010); International Union of Toxicology award (2012); University revitalization grant (2015); TETFUND NRF (2015) and many national and global conference travel supports. He belongs to many learned societies such as: Nigerian Veterinary Medical Association, Society of Toxicology (SOT); American Society of Pharmacology and Experimental Therapeutics (ASPET); Society of Medicinal Plant and Economic Development (SOMPED); Physiological Society, London; British Pharmacological Society; American College of Toxicology.

Publication of speakers:

1. Wu J, Pan X, Fu H, Zheng Y, Dai Y, Yin Y, Chen Q, Hao Q, Bao D, Hou, D. Effect of curcumin on glycerol-induced acute kidney injury in rats. *Scientific Reports* 2017; 7: 1–11. <https://doi.org/10.1038/s41598-017-10693-4>

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