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Rosmarinic acid mediates glucose transporter protein (GLUT-4) by upregulating C-peptide and insulin in diabetic rats

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The study aimed to investigate the potential role of Rosmarinic acid (RA) in the management of diabetes. RA is an ester of caffeic acid found in various plants which have reflected beneficial effects on different disorders. In our study design, the normal rats were treated with different doses of RA to evaluate acute toxicity. Further on the basis of acute toxicity results, two doses of RA were selected for antidiabetic study on STZ-nicotinamide induced diabetic rats. Diabetic rats were fed 50 and 100 mg/kg body weight of RA daily for 90 days and weekly measured with certain biochemical parameters, blood glucose, insulin, C-peptide, lipid profiles and body weight. At the end of the study period, all the group animals were sacrificed and the blood glucose, insulin, C-peptide, and HbA1c levels were determined in the serum of rats. In addition, histology of pancreas and the expression of glucose transporters (GLUT 1, 2 and 4) proteins were assessed in skeletal muscles and pancreatic tissues. The overall study result demonstrated that RA has potentially normalized the elevated blood glucose levels and significantly improved serum insulin, C-peptide and HbA1c levels thereby reducing cholesterol and bad lipids. Furthermore, the histology result reported recovery in the structural degeneration in the pancreatic tissues, and the western blot analysis showed the significant increase in the GLUT-2 and GLUT-4 protein expression in the skeletal and pancreatic tissues. Altogether, we may postulate that the translocation of glucose transporter proteins (GLUT-4) accelerates the insulin-mediated glucose uptake in muscle and adipose tissue. Thus, we may conclude that RA could be the potential targets for the management of diabetic complications and needs further in depth mechanistic studies at molecular level.

Biography

Aditya Arya is a Senior Lecturer of Pharmacology at Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia. He has received PhD in Pharmacology from the University of Malaya and have published over 30 peer-reviewed papers in reputed Journals. He has been serving as a reviewer for many ISI Journals including editorial board member. His research emphasizes on cellular and molecular Pharmacology, specifically to evaluate the co-relationship between inflammation, cancer and diabetes. He is expert in designing, development and mechanistic prediction of drug molecules on the living system and their role on G-protein-coupled receptors in islet function and stimulus-response coupling in mouse and human islet β -cells. Moreover, to detect and identify novel insulin secretagogues.

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