Naringenin potentiates metformin action by upregulation of organic cation transporter 1 (OCT1) in vivo

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Metformin (dimethylbiguanidine) is the first choice oral anti-hyperglycemic drug for use as monotherapy in newly diagnosed T2DM patients. However, there is considerable variation in response to metformin at the individual level. Several mechanisms have been proposed to explain these variabilities including reduction in hepatic uptake of metformin. The preferential action of metformin in hepatocytes is due to the predominant expression of organic cation transporter 1 (OCT1). It is known that variabilities of OCT1 expression may affect response to cationic drugs such as metformin. Citrus fruit flavonoïd naringenin possesses wide biological and pharmacological properties. Recent reports have associated in vitro activity of naringenin with improved glucose uptake into target cells. This study aims to investigate the effects of naringenin on OCT1 expression in streptozotocin induced diabetic rats treated with metformin. Male Sprague-Dawley rats (200-300g) were randomly divided into 7 groups (n = 7). Group 1 animals were orally treated with 3.0 ml/kg Body weight (BW) of distilled water. Groups 3,5,7 were treated with 250 mg/kg BW of metformin while, groups 3,6 and 7 were similarly treated with 60.0 mg/kg BW of naringenin. Groups 4,5,6 and 7 were given 60.0 mg/kg BW intraperitoneal injections of streptozotocin. Fasting blood glucose and glucose tolerance tests were done. OCT1 expression was analysed by western blot in homogenized liver tissues. Naringenin treatment improves weight loss, polydipsia and significantly increased OCT1 expression in liver tissue homogenates compared to non-treated groups. Naringenin increased OCT1 expression in the liver. It could therefore improve hepatic uptake of metformin and potentiate its action.

Biography

Being a holder of a Master's degree in Biochemistry, Edith Pascale MOFO is a PhD student in pharmacology at university of Kwazulu Natal, South Africa. Her research work is mainly focused on genetic and pharmacogenomics of diabetes and metabolic disorders. She is author (co) of 6 publications in international peer review journals.

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