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Effectiveness of Metformin as dual application in treating obesity and diabetes in mouse model

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Overweight and obesity is the fifth leading risk factors for mortality, accounting for approximately 2.8 million adult deaths globally each year. Overweight and obesity are defined as abnormal fat accumulation that may impair health. Consumption of high-fat diet (HFD) or high-sucrose diet (HSD) intake was shown to contribute to complications such as hyperlipidemia and glucose intolerance. Metformin is widely used as treatment and prevention of obesity as well as for the extension of healthy lifespan. Our objective was to establish and standardize a model of high fat diet induced obesity and high sucrose induced diabetic models and to test the dual application of metformin treatment for obesity and diabetes. Six weeks old male Wister rats were fed with HFD, HSD or both and treated with metformin. The duration of the study was 180 days. Increased levels of blood glucose (>11.0 mmol/L); ($p<0.01$), were observed in mice fed with HFD, HSD and combination of HFD & HSD. Lipid profile parameters were significantly ($p<0.01$) increased in the HFD group. After 10 weeks of metformin therapy, blood glucose levels and lipid profiles of mice in HFD and HSD+metformin groups was significantly lower ($p<0.01$) in comparison to the control group. Blood glucose level of HSD+metformin group was also significantly lower ($p<0.01$) in comparison to the HSD group. Our findings showed metformin is effective in treating diabetes and obesity in a mouse model. We also performed histological procedures to examine the effects of metformin treatment on pancreas and brain tissues.

Biography

Christina Gertrude Yap has obtained her PhD from Monash University in 2012. During her PhD research project, she explored candidate early predictors for diabetic nephropathy. Her hypothetical candidate early predictor for diabetic nephropathy risk is CYP2E1. Following that in her Post-doctoral projects, she developed a targeted proteomic approach to quantitate CYP2E1 from human blood samples validated and assessed the applicability of this analytical method in clinical practice. Her research interest includes early biomolecules in the development of metabolic syndromes. Currently, she is a Senior Lecturer (Metabolic Medicine) at the School of Medicine, Monash University Malaysia in Kuala Lumpur, Malaysia.

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