



Mini Review

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## Type 2 Diabetes Mellitus



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### Mini Review

The incidence of diabetes mellitus (DM) is increasing particularly in the developing nation. It is also one of the major global public health problems. The World Health Organization (WHO) predicts that over 330 million people worldwide will have DM and around 5-10% of national health care budget are estimated to be allocated for DM alone by 2030 WHO [1]. DM also is closely related to the increase of premature and preventable death. The number of death attributed directly or indirectly to DM has reached 3.7 million in 2012 WHO [2]. The chronic hyperglycaemia (an abnormally high amount of glucose level in blood) of diabetes is associated with long-term damage, dysfunction, and failure of various organs and other macro and microvascular diseases, such as end-stage renal failure, blindness, heart disease, stroke, dementia and leg amputation Cade [3]; WHO [2].

There are two types of DM namely Type 1 diabetes and Type 2 diabetes mellitus (T2DM). T2DM is a more prevalence type (85 % of people with DM) which causes by heterogeneous disorder involving progressive development of insulin resistance in liver and peripheral tissues accompanied by defective insulin secretion from pancreatic beta cells that leads to hyperglycemia. Despite the genetic predisposition, the risk of developing T2DM is increased with age, obesity and lack of physical activity.

90% of patients with T2DM are obese or overweight. This makes obesity and overweight the leading factor of the increase of T2DM WHO [4]. Obesity and overweight happen when the calories intake is higher than the calories expended. High fat diet which is energy dense easily caused overweight and obesity WHO [5]. T2DM patients can improve their outcomes through healthy living by combination of diet and physical activity. As we observed the eating habits of a group of diabetic patients, we found that although many of the patients was able to abide to a tight control on diet, many more do not many delicacies are with high fat content. However, the exact mechanism linking high fat diet and diabetes still remain on high debate especially with the

risen popularity of the low carbohydrate high fat diet Gunnarsson and Elam [6].

Metabolic profiling is able to give an instantaneous snapshot of the physiology of cell as metabolites are the end products of cellular processes Jordan et al. [7]. It is expected that diabetes will perturb several metabolic processes including energy metabolism and nucleotide metabolism. The end products, N-methylnicotinamide and N-methyl-2-pyridione-5-carboxamide (2PY) of nucleotide metabolism has been detected in great quantity in diabetic mouse, rat and human Salek et al. [8] N-methylnicotinamide has been implied to exert antithrombotic and anti-inflammatory effects through direct action on the endothelium which may induce vasorelaxation in human blood vessels Domaagala et al. [9]. On the other hand, 2PY has been suggested to be a uremic toxin that deteriorates kidney function Lenglet et al. [10]. Hence, the effect of these two compounds on human health is contradictory. Hence, the effect of changes of metabolites profile in diabetic patients is yet to be investigated.

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