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EDITORIAL

Diabetes: A Silent Killer

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You may be surprised to know that one in six Malaysian adults over 30 years old are diabetic and the more disturbing fact is diabetes records very high mortality rate where every ten seconds one person dies of diabetes and its consequences![1]. The World Health Organization (WHO) reports that 177 million people around the world are afflicted with this disorder of the metabolic and endocrine systems and predicts at least 300 million people worldwide will live with this disease by the year 2025[1]. It is time to revisit our approaches to target this silent killer by all possible means which include prevention, treatment, monitoring and management of the disease.

The main culprit that mediates diabetes-associated pathology is the chronic generation of free radicals that gradually and constantly damage the vital organs till lead to organ failure. Briefly, increased oxidative stress in cells and tissues by uncontrolled blood glucose in diabetes patients inhibits the activity of mitochondrial enzymes; escalates upstream metabolites products from glycolysis; thus, contributes to the pathogenesis of diabetic complications[2, 3].

Besides the conventional treatment of diabetes which mainly focuses on normalising blood glucose levels and pacifying the complications, a lot more innovative therapies are currently being investigated to manage or cure diabetes. Advances in transplantation procedures have improved cadaveric pancreatic islet cell implantations, indicating positive signs to restore the pancreas function in type I diabetes. However this effort is hindered by the availability of donors which drives the search for a substitute to transplant tissues. The continuous urge for finding an alternate source of pancreatic islets through animal and laboratory studies has led to consideration of stem cell therapy.

Recent scientific data, without any doubt, show that insulin-expressing cells can be derived from a number of different adult, perinatal and embryonic stem cell populations. Among all, bone marrow derived mesenchymal stem cells, liver progenitor cells, neural stem cells, pancreatic stem cells, induced pluripotent stem cells and embryonic stem cells have shown a great potential towards differentiating or trans-differentiating into beta cells[4]. However the major obstacle in consuming such stem cells mainly lies in lack of appropriate in vivo studies to monitor guided cell differentiation, ethical issue related to human embryonic stem cells, risk of tumour formation and immune rejection by recipients if stem cells were derived from an allogenic source. Nevertheless, human embryonic stem cells have been demonstrated to differentiate into insulin-producing beta cells within the pancreatic niche, hence validating the inherent ability of transplanted stem cells to response towards environmental signals[4]. However, one should bear in mind that rejuvenation or regeneration of pancreatic beta cells by stem cells still lacks long term stability and side effect analysis. Scientific evidence has recorded the formation of teratomas or inappropriate tissue growth in unexpected areas in immunodeficient mice with implanted embryonic stem cells[5]. Therefore, stem cells therapy that aims to restore pancreatic beta cells is still in need of appropriate pre-clinical studies and well designed clinical trials to consolidate its safety and efficacy prior to translating into human application.

Therapeutic approaches to manage the progression of diabetic complications are currently being undertaken by targeting the molecular pathogenesis of diabetic complications[6]. It is clearly understood that regiments that reduce free radicals is significantly beneficial in managing hyperglycaemia-induced complications. Besides that, it also necessitates continuous monitoring of chronic diabetes complications since the mortality rate among diabetes patients is closely proportioned to its complications. In this publication issue, the feasibility of monitoring Hb1Ac as an index of glycaemic control in Hb variants population has further delineated by S Intan Nureslyna and colleagues. This study was conducted in Hospital Kuala Lumpur and revealed that only 2.3% patients with Hb variants were detected during routine analysis. This finding may serve as useful information for clinicians as these variants may alter the actual HbA1c values and thus, not represent the true glycaemic control of patients with diabetes.

Diabetes is not only a health issue, but has become a tremendous economic burden to the government as large amounts of funds are continuously allocated to control this non communicable disease. It requires strong and strategic inter field collaboration amongst community based researchers to elicit awareness among high risked

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individuals and laboratory and clinical based interventions to revamp the current treatment for diabetes as these attempts will be the gateway to free our future generation from this silent killer.

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