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Editorial

Prevailing Commercialism in Diabetes Care, Is the Road to Diabetic Complications?

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EDITORIAL

Diabetes Mellitus (DM) or diabetes in layman's term affects people of all ages and races and has imposed a serious economic burden on the healthcare system mainly due to treatment of its complications. DM or diabetes is defined originally by Frederick Banting in his Nobel Prize speech on September 25, 1925 as a metabolic disorder due to deficiency of the internal secretion of the pancreas. Therefore the main principle of treatment is to correct the deficiency. If it is found that the patient is unable to keep sugar free on a diet that is compatible with an active, useful life, sufficient insulin is administered to meet this requirement.

Thus it is important to convey to the public that there is one diabetes and is defined by 2-h postprandial glucose (2h-PPG) ≥200mg /dl (≥ 11.1mmol) found in post challenge glucose or 4-h glucose tolerance test. 2-hPPG for the diagnosis of diabetes has 97% sensitivity, 100% specificity and 100 % positive predictive value [1].

World Health organization (WHO) stratified diabetes into Type 1 and Type2 diabetes; Type 1 DM seen in children is due to deficiency of insulin thus requiring insulin treatment to stay healthy. On the other hand, most adults have Type 2 DM which is insulin-resistant. thus generally not requiring insulin. Strangely enough, nowhere to be found how WHO developed this classification. This classification has deprived the adult population with overt diabetes of insulin therapy thus giving rise to disastrous complications and high mortality in adults with diabetes. Thus, the purpose of this editorial is to elaborate on the fundamental problems underlying serious complications seen in adult population with diabetes and how do these complications be prevented, thereby permitting the adults with diabetes to live a promising life. While uncontrolled hyperglycemia is associated with high risk of developing one or more microvascular complications, well controlled blood glucose levels with insulin therapy afford protection from these complications [2-4].

Evidence is subtle with regard to duration of diabetes giving rise to irreversible micro vascular diseases. Our laboratory research on cell culture studies is a replica of the mechanism of the diabetic micro vascular complications and the findings are comparable to duration of diabetes required to produce severe micro vascular disorders. In addition our research findings provide stimulating scientific evidence in support of prevention of micro vascular lesions [5,6].

Vascular endothelial cells (ECS) were treated with normal concentrations of glucose (90mg/dL) or high concentration of glucose (540mg/dL) with and without insulin and heparin for 2 days, 6 days or 10 days to answer severity of ECS damage and its relationship to duration of treatment and recommendation for the prevention of ECS damage. While high glucose treatment of ECS for 2 days produces apoptosis, high glucose treatment for 6 to 10 days produces partial or complete necrosis of ECS [5-6]. Shedding of ECS, associated with deposits of platelets and cholesterol forms micro thrombi with occlusion of arterioles and capillaries and giving rise to ischemic lesions. Example of ischemic lesions include foot ulcer, gangrene of toes and feet, nephropathy with proteinuria and renal failure, angina or myocardial infarction and stroke; ischemic autonomic neuropathy associated with urinary retention and sexual dysfunction. In fact DM, undiagnosed, untreated or inadequately treated is the most common cause of sexual dysfunction in men and women. Up to 75% of men with diabetes have a lifetime risk of developing erectile dysfunction [7]. Our cell culture studies have shown that glucose induced EC Injury can be ameliorated by the addition of insulin to ECS cultures with enhanced effects in the presence of heparin. It is also observed that insulin prevents glucose induced ECS injury without lowering the glucose level in the culture plate, suggesting that insulin has a vascular protection which appear to be independent of a glucose-lowering effect [6].

In the current practice of diabetes the most commonly prescribed drugs include metformin (antidiabetic agent) and angiotensin converting enzymes inhibitors (ACEI) or angiotensin receptor blocker (ARB). Thus the worst commercialism is attributed to connotation of every adult with diabetes as Type 2 DM and an automatic prescription of metformin and Lisinopril or enalapril (ACEI). Seldom does a provider discuss insulin treatment even though blood glucose level may be 300 to 400mg/dL or higher. For example a 75 year white male experienced difficulty in urination and went to a urologist for evaluation. A random renal function panel showed blood glucose of 400mg/dL (22.2 mmol/L). He didn't know that he has DM. Thus hewas sent to a primary care physician, who diagnosed him to have Type 2 DM. A nurse practitioner in the office prescribed him

metformin 500mg BID, enalapril 10mg BID, Glucotrol XL 10mg PO daily and furosemide 40mg daily. The physician or nurse practitioner didn't know what they did because they followed the guidelines for type 2 DM. His diabetes remained uncontrolled and he developed acute renal failure and was admitted into a local hospital. In the hospital, his random glucose was 207 mg/dL, serum creatinine 2.42mg/dL with eGFR of 28ml/min. All home medicines were discontinued and he was started on a combination of Glargine and regular insulin. His glucose control and renal function improved overtime. All these involve interest, time and education of professionals which are rare. Lack of knowledge of the professionals and overriding influence of the pharmaceutical industry to prescribe metformin and state and Federal regulations to prescribe ACEI/ARB for renal protection in Type 2 diabetes continue to victimize the adult patients with diabetes. Further failure to discontinue ACEI/ARB has resulted in high incidence of end stage renal disease (ESRD) and dialysis in diabetes. Dialysis business is thriving by leaps and bounds enriching the professionals and corporations. [8] What can be done to reverse the business enterprise in diabetes care. The first and foremost step will be to individualize diabetes care. To accomplish that goal the following measures are recommended.

1. The rubber stamp policy of labeling adults with diabetes as Type 2 diabetes and handing over prescription of metformin and ACEI/ARB drugs must be abandoned
2. Order fasting and 2hPP basic metabolic panels which provide glucose levels, BUN, serum creatinine and eGFR and electrolytes.
3. 2hPPG above 200mg/dL with dglucose above 50mg/dL must be treated with a combination of Glargine (Lantus ®) or detemir insulin (Levemir ®) and regular insulin. Glycemic control with intensive insulin therapy is fundamental to renal preservation in diabetes [9]

We have shown that dglucose (2hPPG-FBG) per 100mg/dL or more in those with 2hPPG above 200mg/dL increases serum creatinine by 0.11 mg/dL which is significant. In general, renal function remains essentially unchanged in those with 2hPPG of less than 200mg/dL [10]

4. Blood pressure (BP) control less than 130/80 adds to renal preservation and can be accomplished with beta blockers, calcium channel blockers, a combination of both, sympathetic inhibitor and chlorthalidone in resistant hypertension. The goal is BP control not the type of agents used [10].

Finally, ACEI/ARB drugs must be excluded in diabetes care to prevent dialysis and permit diabetes patients live a complication free life.

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