

Essay on diabetes type 2

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Introduction

Diabetes mellitus is chronic metabolic disorder characterized by elevated blood glucose levels as a result of a dysfunction in the hormonal regulation of blood glucose. The dysfunction of blood glucose regulation occurs due to deficiency of insulin, the resistance of target cells to insulin thus resulting to elevated levels of blood glucose (hyperglycemia). Based on the mechanism resulting in elevated blood sugar there are basically two types of Diabetes: Type I diabetes (insulin-dependent diabetes mellitus (IDDM)) emanates from insufficient insulin due to inability of pancreatic beta cells to produce enough insulin. On the other hand Type II diabetes, (non- insulin-dependent diabetes mellitus (NIDDM)) occurs when insulin has no effect on the target cells due resistance. In both types of diabetes the metabolism of carbohydrates, fats and protein is affected in one way or the other. While the carbohydrates (glucose) are minimally utilized in a diabetic person, proteins and fats are over utilized as they become the primary source of energy. Suffice to say that in Type II diabetes, which is the focus of this paper, the body is producing insulin but due to resistance to insulin the levels of glucose are elevated . In order to understand the Type II diabetes it is vital to understand the hormonal regulation of blood sugar.

The Role of Insulin and glucagon in regulating blood sugar

Two Pancreatic hormones are responsible for the regulation of the blood glucose which normally occurs in the liver. Insulin a small protein hormone is usually produced by Islets of Langerhans cells in the pancreases. The hormone is produced in response of high levels of circulating glucose in the

blood in order to down regulate the glucose levels. The liver and muscle cells are stimulated by insulin to take up glucose in the blood and converted into glycogen which is the storage form of glucose. This result in the storage of a soluble nutrient (glucose) absorbed in intestines into insoluble product (glycogen). Other cells of islets secrete glucagon a protein hormone that primarily acts on the liver cells. Glucagon secretion is triggered by low glucose levels in blood circulation and inhibited by high levels so as to increase the level of blood glucose level. The secreted glucagon results in the conversion of glycogen stored in the liver and muscle cells into glucose which is then deposited into the blood. Thus the physiological function of insulin and glucagon is maintaining a stable blood sugar levels.

Diabetes type 2 and its management

As earlier stated Type 2 Diabetes results from the cells (mainly in the muscles, adipose and in the liver) to the secreted insulin so that the glucose in the blood is not utilized (converted to energy and the excess to glycogen). The insulin resistance is thought to be as a result of a genetic defect affecting the insulin receptors on the cells. This eventually leads to the accumulation of sugar in the blood (hyperglycemia). This type of diabetes is associated with increased urination and thirst, blurred vision, hunger, fatigue, weight loss, acanthosis nigricans (dark patches on the skin), frequent infections and slow wound healing. If not treated and well managed Type 2 diabetes can fatal. Unfortunately there is no known cure for Type 2 diabetes but it can be prevented and managed through diet and exercise.

Diabetes type 2 maintenance is mainly by strategies that lower the blood sugar levels. Unlike type 1 Diabetes type 2 Diabetes is not managed by insulin injection because the cells do not respond to insulin. The most important strategy is Dietary management of diabetes type 2 which mainly involves doing away with sugary foods and especially those with refined sugar that enters the blood directly without going through much metabolism. Diabetics are therefore advised to take well balanced diet that is low in simple sugars and fat (especially cholesterol). Exercise and weight reduction help in controlling the blood sugar by increasing sensitivity of cells to insulin. Stress management is also helpful in preventing over secretion of cortisol which aggravates diabetes.

The doctor may recommend drugs for the management of diabetes. Sulfonylureas such as chlorpropamide, glipizide, tolbutamide, glyburide and glimepiride increase insulin output thus reducing the sugar blood level. Thiazolidinediones such as rosiglitazone and pioglitazone increase sensitivity of cells to the production of insulin. Biguanide such as glucophage (metformin) treat type 2 diabetes by decreasing glucose production by the liver. Precose is another drug used and it works by decreasing the absorption of carbohydrates from the intestines to the blood circulation.

Cortisol and its effect

Cortisol is an important glucocorticoid produced by the adrenal cortex gland in responses to stress, thus is also called the stress hormone. The primary result of cortisol secretion is the relaxation of the body. Its release also results to a quick burst of energy for survival, low sensitivity to pain and

heightened memory function. Cortisol enhances proper glucose metabolism among other functions. With regard to glucose metabolism cortisol increases the blood sugar level by a process called gluconeogenesis which involves the production of glucose from non-carbohydrate molecules such as glycerol, proteins and lactate. Stress is therefore likely to complicate diabetes because it results in increase of the blood sugar level due to the release of cortisol in a person with a dysfunctional glucose regulation mechanism.

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