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Insulin Resistance: A Short Review

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Abstract:
Insulin resistance is a metabolic disorder whereby the cells of the body become unresponsive to the effect of insulin leading to the inability to take in glucose and to have elevated blood glucose. It is regarded as one of the significant causes of the emergence of type 2 diabetes mellitus, obesity, metabolic syndrome, and cardiovascular diseases. Resistance to insulin arises when the body fails to respond adequately to insulin receptors in the muscle, fat, and liver cells which results in high production of insulin by the pancreas to have normal level of sugar in the blood. Unhealthy diet, sedentary lifestyle, obesity and genetic predisposition as well as hormonal imbalance are some of the factors leading to insulin resistance. Metabolic disorders have complications that should be avoided by early detection and management. Lifestyle changes such as physical exercise, maintenance of weight and proper diets contribute largely to the enhancement of the insulin sensitivity. It is significant that healthcare professionals, specifically nurses, contribute to the education of patients, screening of patients in an early stage, and patients' management at risk. The concept of insulin resistance and the risk factors that relate to its occurrence is important to prevent the advancement of type 2 diabetes and improve the overall state of the metabolism.

Key words: Insulin Resistance, Type 2 Diabetes Mellitus, Metabolic Syndrome, Blood Glucose, Insulin Sensitivity.

INTRODUCTION

Insulin resistance is a medical condition whereby the cells in the body are not responsive to the hormone insulin. Insulin plays the role of maintaining the levels of blood glucose by enhancing the uptake of the glucose into the cell to generate energy. When insulin resistance occurs, the muscles, liver, and fat tissue cells fail to respond to insulin causing a rise of blood glucose. In response, the pancreas secretes more insulin resulting in hyperinsulinemia. Constant insulin resistance is viewed as the significant factor contributing to the development of type 2 diabetes mellitus and other disorders of the metabolism [1].

INSULIN RESISTANCE PATHOPHYSIOLOGY.

Diabetes is caused by insulin resistance which is the result of poor insulin receptor in target tissues like skeletal muscles, liver and adipose tissue. In the usual state of affairs, insulin attaches to receptors on cell membranes and triggers the mechanism of signaling glucose into the cells. In insulin resistance, however, such signaling pathways are less efficient leading to decreased glucose uptake and elevated glucose concentrations in the blood. Obesity and especially abdominal obesity is one of the contributing factors to insulin resistance as the fatty acids and inflammatory mediators become more prevalent in the body [2].

RISK FACTORS OF INSULIN RESISTANCE.

Resistance to insulin is developed in several factors. These are obesity, lack of physical activity, poor nutrition, genetic factors, old age, and hormonal disorders. The surplus body fat, in particular, visceral fat disrupts the action of insulin and encourages metabolic changes. Unhealthy conditions of sedentary lifestyle and diets with high calorie content and a large proportion of refined carbohydrates and saturated fats increase the risks of insulin resistance and associated metabolic disorders [3].

CLINICAL SIGNIFICANCE

Resistance to insulin is critical to the occurrence of various chronic diseases. It has a close linkage with type 2 diabetes mellitus, metabolic syndrome, high blood pressure, and heart diseases. Insulin resistance can also lead to dyslipidemia, which involves an elevated level of triglycerides and the low level of high-density lipoproteins (HDL). Insulin resistance is a condition that should be detected early on to prevent the development of diabetes and other complications [4].

MANAGEMENT AND PREVENTION

The major strategy in insulin resistance management is through the lifestyle modification. Exercise enhances sensitivity to insulin through augmenting muscle uptake of glucose. Balanced dieting with whole grains, fruits, vegetables and fiber also maintains control of the level of blood glucose. Loss of weight, stress management and proper sleep continue to enhance better metabolic wellness. In other instances, insulin sensitizing drugs could be given to supplement lifestyle modifications [1].

CONCLUSION

Insulin resistance refers to a serious metabolic disorder, which leads to the occurrence of type 2 diabetes and other chronic illnesses. Prevention strategies should be put in place to mitigate its effects on the health of the population by identification of the risk factors at an early stage. Healthy lifestyle, including good diet, physical activity, weight control, etc., are important to enhance insulin sensitivity and avoid metabolic complications.

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