

Neglected Factor during Cancer Progression by Hyperglycemia

Laura Soysal*

Department of Internal Medicine, University of Katip Celebi and Atatürk Research and Training Hospital, Turkey

Abstract

Recent data from sizable cohort studies shows that persons with type 2 diabetes have a greater cancer incidence. The probable causes of this relationship are yet unknown, though, as of this writing. These glucose-hungry cells may get extra glucose from hyperglycemia, the most significant aspect of diabetes, which also leads to oncogenesis, apoptosis resistance, and chemotherapy-resistant tumour cells [1]. The impact of hyperglycemia on the advancement of cancer in cancer patients with abnormal blood glucose levels should not be disregarded given the link between diabetes and malignancies [2]. In this article, we discuss the role that hyperglycemia plays in the development of cancer and its management, as well as how it might influence the phenotypic of cancer cells and promote drug resistance. Consequently, managing hyperglycemia may Hyperglycemia, also known as high blood glucose, is a condition that occurs when there is either an insufficient quantity of insulin in the body or when the body is unable to properly utilise the insulin that is present [3].

Keywords: Hyperglycemia; Diabetes Mellitus; Obesity; Oancreatitis

Introduction

Hyperglycemia can be brought on by a variety of illnesses, such as diabetes mellitus, obesity, pancreatitis, chronic stress, and cancer [4]. It is interesting to note that the epidemiological data now available suggests that all of these hyperglycemia-related disorders are probably linked to carcinogenesis or tumour growth. The effects of hyperglycemia on the heart, kidneys, nerves, and eyes are now the primary areas of investigation; the effects of hyperglycemia on cancer have received minimal attention [5]. The link between hyperglycemia and cancer should get considerable attention given the frequency of hyperglycemia-related disorders found in cancer patients. The DM is the most typical medical disorders that cause hyperglycemia [6].

Discussion

Blood sugar levels rise in people with diabetes mellitus either as a result of low insulin levels or poor insulin utilisation [7]. 347 million people worldwide now have diabetes mellitus, and this figure is expected to rise. Epidemiologic research has previously indicated that patients with diabetes have a greatly increased chance of developing a variety of cancers. Diabetes has been linked to the emergence of solid organ malignancies, such as liver, pancreas, colorectal, breast, endometrial, and bladder cancers [8]. Liver cancer and pancreatic cancer among them have the highest correlation with DM2. 23 articles from a recent meta-analysis showed a 41% rise in cancer mortality as a result of Compared to people without diabetes, patients with pre-existing diabetes had higher rates of endometrial, breast, and colorectal cancer [9]. As a result, there is strong evidence from several researches linking diabetes to a higher chance of developing cancer[10]. Contrarily, diabetes is more common among cancer patients than in the general population; as a result, newly developed diabetes may be a precursor to subclinical cancer. Following the discovery of hyperglycemia in cancer patients in 1885, Warburg et al. in the journal Cancer Research revealed that tumour tissues sustained greater rates of glucose consumption than normal cells. Various cancer patients have been studied in several clinical investigations to look for evidence of changes in carbohydrate metabolism. The clinical findings suggested a link between neoplasia and concurrent glucose problems. Metabolism additionally, other groups have revealed particular molecular pathways linked to the absorption of glucose in cancerous cells. Fludeoxyglucose absorption is elevated in the majority of malignant tissues and is accompanied by

accelerated glycolysis and glucose transport. The proliferative activity of malignant tissue and the quantity of live tumour cells are complexly connected to the rise in 18F-FDG absorption seen in malignant tissue.

Conclusion

A growing body of data points to a strong connection between diabetes and a number of cancers, but the underlying biological mechanisms are still poorly understood. It is not difficult to imagine that hyperglycemia may play a significant role during the progression of cancer in cancer patients with DM given that hyperglycemia is the most significant biological feature of DM and cancer, both of which are composed of cells that crave glucose. Here, we examine the evidence for the association between hyperglycemia and many biological traits of cancer. It suggests that cancer cells' malignant phenotype, which includes proliferation, apoptosis inhibition, metastasis, perineural invasion, chemotherapy resistance, and treatment intolerance, may be influenced by hyperglycemia. Controlling blood glucose and insulin levels at the proper level would be advantageous in cancer patients who have DM since high glucose and high insulin can both promote cancer cell proliferation through many pathways. Studies have revealed increased expression of the collagen receptor as well as other kinases that control a wide range of cellular functions, such as growth and proliferation, under hyperglycaemic circumstances. There is some evidence to suggest that diabetes may encourage PC cell growth.

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*Corresponding author: Laura Soysal, Department of Internal Medicine, University of Katip Celebi and Atatürk Research and Training Hospital, Turkey, E-mail: LauraSoysal90@gmail.com

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Conflict of Interest

None

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