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Correlation between treatment of diabetes mellitus and development cancer

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Date of submission : 9/3/2020

Abstract: Diabetes and cancer are two heterogeneous, multifactorial, severe, and chronic diseases. Because of their frequency, reciprocal influences – even minor influences – may have a major impact. Epidemiological studies clearly indicate that the risk of several types of cancer (including pancreas, liver, breast, colorectal, urinary tract, and female reproductive organs) is increased in diabetic patients Mortality is also moderately increased. Several confounding factors, having general or site-specific relevance, make it difficult to accurately assess cancer risk in diabetic patients. These factors include diabetes duration, varying levels of metabolic control, different drugs used for therapy, and the possible presence of chronic complications... While anti-diabetic drugs have a minor influence on cancer risk (except the metformin that apparently reduces the risk), umerous studies have identified an increased risk of cancer in type 2 diabetes.

Introduction

Diabetes Mellitus ：(glucose) levels are abnormally high because the body does not produce enough insulin to meet its needs. Urination and thirst are increased, and people may lose weight even if they are not trying to. Diabetes damages the nerves and causes problems with sensation,Type one diabetes**:** characterized by an absolute deficiency of insulin secretion caused by pancreatic beta cells destruction Pathogeneses : three mechanisms are responsible for its pathogeneses 1_autoimmunity : the fundamental immune abnormity in type1 diabetes is failure of self tolerance in Tcells specific for beta cell 2_genetic susceptibility :HLA DR3, DR4 individuals 3_enviromental :viral infection " mumps, coxsaxie B viral "Diabetes type 2 : combination of peripheral resistance to insulin action and an inadequate compensatory responses of insulin secretion by the pancreatic beta cells Pathogeneses : there is correlation between the disease and increasing in age (possibly related to loss beta cell function Sedentary life style and dietary habits, as will become evident when the association with obesity is considered _ genetic factor : associated with transcription factor 7_like2 (TCF7L2) on chromosome 10q

Cancer : the uncontrolled of abnormal cells in the body Pathogeneses: Mutation inactivates tumor suppressor gene >>> cells proliferate >>> mutation inactivates DNA repair gene >>> mutation of proto-oncogene >>> mutation inactivates several more tumor suppressor genes >>> cancer Main factor causes cancer: Diabetes (primarily type 2) is associated with increased risk for some cancers (liver, pancreas, endometrium, colon and rectum, breast, bladder) Overweight, Obesity, and Weight Change,dite, Physical Activity (1)

The association between cancer and diabetes has been investigated extensively and most, but not all studies, found that DM is associated with an increased risk of several types of cancer. Most published data, however, requires reinterpretation because DM is not a single disease, but rather a group of metabolic disorders characterized by hyperglycemia. Within this general context, each type of diabetes has additional metabolic and hormonal abnormalities that differently affect diabetic patients. It is therefore inappropriate to consider diabetic patients as a homogeneous cohort. In addition, a series of potential confounders directly related to the disease (obesity,

quality of metabolic control, drugs employed for treatment, diet, etc.) and present in diabetic patients may influence the association between diabetes and cancer. (2)

Aim of study :to know if the diabetes increase the risk factor of cancer and if the metaformen reduce the causes of cancer and insulin increase the causes of cancer

Method and material:

A literature search was performed to discover studies reviewing the correlation between diabetes mellitus and cancer , online sites and databases included in this report are pubmed database , and the American society of clinical oncology for relevant reports . search terms included "diabetes and cancer" "how diabetes mellitus increase risk factor of cancer " " Correlation between diabetes mellitus and development cancer "

Result:

As a result of this study, the team monitored 8,485 cases of cancer among the participants, but the quality of cancer differed in men compared to women. Among the type 2 diabetes patients, the researchers found, men were 34% more likely to develop cancer than their healthy peers, while the rate increased to 62% among women. Males with diabetes were more likely to develop 11 different types of cancer, while females were more likely to have 13 different forms of cancer. In this study, the researchers emphasized that hyperglycemia, hyperinsulinemia are the two main causes of cancer, so people with type 2 diabetes are more likely to develop cancer than healthy people.

We identified 10,309 new users of metformin or sulfonylureas or insulin ,4.9% for sulfonylurea monotherapy users, 3.5% for metformin users, and 5.8% for subjects who used insulin. After multivariate adjustment, the sulfonylurea cohort had greater cancer-related mortality compared with the insulin

During 2.3 million person-years of follow-up, we identified 6,220 women with type 2 diabetes and 5,189 incident cases of invasive breast cancer. Women with type 2 diabetes had a modestly elevated incidence of breast cancer compared with women without diabetes, independent of age, obesity, family history of breast cancer, history of benign breast disease, reproductive factors, physical activity, and alcohol consumption. This association was apparent among postmenopausal women but not premenopausal women, The association was predominant among women with estrogen receptor-positive breast cancer

Discution

Diabetics have a 2.5-fold greater risk for developing some types of cancer, and these 1c&include ovarian, breast, kidney and other cancers, and as diabetes continues to rise and blood levels rise, the incidence of cancer is also likely to increase. A number of factors have been proposed to contribute to the increased risk of cancer development These include, hyperglycemia, increased insulin-like growth factor-1 (IGF-1) levels, hyperglycemia: High blood sugar levels damage DNA, which increases the risk of cancer. And increased insulin-like growth factor-1 (IGF-1) levels: IGF-1 is known to promote cancer development by inhibiting apoptosis and stimulating cancer cell proliferation

In this study it was confirmed that type 2 diabetes is linked to an increased risk of various types of cancer in men and women, To uncover the relationship between diabetes and cancer, the team followed up the cases of 410,191 men and women with type 2 diabetes, between the ages of 20 and 99 years, At the beginning of the study, which continued from 2013 to 2017, none of the participants had any cancer, but at the end of the study the team followed the participants to find out who had cancer and what type of cancer the doctors diagnosed., the team monitored 8,485 cases of cancer among the participants, but the quality of cancer differed in men compared to women.Among the type 2 diabetes patients, the researchers found, men were 34% more likely to develop cancer than their healthy peers, while the rate increased to 62% among women.Males with diabetes were more likely to develop 11 different types of cancer, while females were more likely to have 13 different forms of cancer. More specifically, the risk of prostate cancer increased by 86% in males with type 2 diabetes compared to their healthy counterparts, and they also had a high risk of developing cancers of blood, skin, thyroid, lymph nodes, kidneys, liver, pancreas, lung, colon, and stomach. The second type, they were more at risk of developing breast and uterine cancer, pharynx, in addition to cancers of the gallbladder, liver, esophagus, thyroid gland, lung, pancreas, lymph nodes, colon, blood, breast, and stomach.(4)

This study is the effects of anti-diabetes drugs on T2DM cancer is associated with an increased risk and greater mortality from many cancer types. Metformin use has been associated with a decrease in cancer incidence and mortality, and insulin associated with increase in cancer incidence and mortality.(5)

Insulin may promote mammary carcinogenesis .insulin has been linked to an increased risk of breast cancer and is also characteristic of type 2 diabetes. thes study association between type 2 diabetes and invasive breast cancer incidence, A total of 116,488 female nurses ncreased local production of estrogen may occur as a result of increased expression of aromatase, activating estrogen receptor α in tumor cells. Inflammation in the tissue microenvironment may also be increased by insulin , which leads to local cytokine production and activation the Jak-Stat signaling pathway in the tumor. Erk, extracellular regulated kina

who were 30–55 years old and free of cancer in 1976 were followed through 1996 for the occurrence of type 2 diabetes and through 1998 for incident invasive breast cancer.(6)

conclusion: People with type 2 diabetes are 2.5 times more likely to develop cancer than healthy people, due to a number of factors, including hyperglycemia and increased insulin-like growth factor-1 (IGF-1) levels, And that anti-diabetic drugs, some of which reduce cancer, such as, Metformin and some of them increase cancer, such as insulin.

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