

IS THERE A LINK BETWEEN DIABETES AND PANCREATIC CANCER?

The pancreas' main function is to produce pancreatic endocrine hormones (insulin and glucagon) and pancreatic digestive enzymes that help breakdown carbohydrates, fats, and proteins. Diabetics have a malfunctioning pancreas that introduces problems digesting proteins, fats, and carbohydrates that may lead to pancreatic cancer. Pancreatic cancer is a malignant tumor of the pancreas that affects the cells accountable for insulin and glucagon production. Therefore, it might be assumed that diabetes is a causative agent of developing pancreatic cancer.

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INTRODUCTION

The islets of Langerhans or the β cells are found in the pancreas where they produce and release insulin, a hormone that controls the levels of glucose in the blood. Individuals diagnosed with type 2 diabetes have a condition where the digestion and absorption of the digestive tract do not properly maintain their balance of processing victuals and abnormally high blood sugar (hyperglycemia) due to inadequate amount of insulin. When diabetes is developed, the body's immune system begins to destroy the β cells of the pancreas. Over time, the β cells fail to produce enough insulin. Type 2 diabetes is recognized by insulin resistance in targeted tissues, needing abnormally high amounts of insulin. Insulin resistance (IR) is a condition where normal amounts of insulin are insufficient to produce a normal insulin response from muscle, fat, and liver cells. The cells' DNA is damaged due to the cells' characteristics of being insulin resistant and causes pancreatic tissues cells to grow uncontrollably developing malignant tumors. Exposure to first- and second-hand smoking has been linked to causing the cells to become insulin resistant.

Cancer of the exocrine pancreas is adenocarcinomas that begin in the ducts of the pancreas, affecting the glands, which secrete molecules. The exocrine glands produce pancreatic fluid that is released into the intestines. This fluid contains enzymes that help digest fats, proteins, and carbohydrates. However, cancer prevents pancreatic enzymes from being released into the intestine making it difficult to digest foods. Having this condition can lead to absorption and digestion complications.

Furthermore, insulin resistant cells might be the cause of diabetes developing pancreatic cancer.

METHODOLOGY

Medical data from two different resources were used to study the relationship between patients with type 2 diabetes and pancreatic cancer. From the city of Laredo Health Department "Buena Vida" program, 30 diabetic patients who smoked and were at a greater risk of complications and 30 non-smoking diabetics were selected at random. Each client's medical history was analyzed along with the program's assessment tool. We studied each patient's previous or current history of pancreatic cancer, any other type of cancer and triglycerides, high density levels (HDL), low density levels (LDL), hemoglobin, and glucose. Additionally, Doctors Hospital's Cancer Center had five patients with pancreatic cancer from January through May 2008. The five patients' medical history was studied to determine if any previous diagnosis had been made for these patients prior to having pancreatic cancer. Additional data were gathered from journals, clinics, and other studies.

RESULTS

Of the 60 diabetic patients from the "Buena Vida" program, none had any previous or current medical history of having pancreatic cancer or any other type of cancer. However, 20 of the 60 diabetics had family history of having some type of cancer. Additionally, both previous (3/60) and current smokers (1/60) had inflammation of the lining of

Table 1. Average triglyceride HDL and LDL levels for persons with diabetes

Age Group	Smokers' Triglycerides	Non Smokers' Triglycerides	Smokers' HDL	Non Smokers' HDL	Smokers' LDL	Non Smokers' LDL
18-30	247	N/a	31	N/a	130	N/a
31-50	242.2	159.6	46	61	143	133

the bronchial tubes (bronchitis). Moreover, using the "Buena Vida" program's assessment tool, the majority of the diabetics had above normal levels of triglycerides, LDL, hemoglobin, glucose and low levels of HDL. Two of the smoking diabetics and one non-smoking diabetic had high triglycerides levels (Table 1). According to the assessment tool used on these patients, 41 of 60 diabetics were physically inactive and overweight. Being inactive can result in having excessive amount of adipose tissue, increasing BMI. All 60 diabetics, including smokers, had a BMI of ≥ 23 . Non-smoking diabetics had a high glucose level (avg 165) while smoking diabetics had an average of 175.

Based on Doctors Hospital Cancer Center, none of the pancreatic cancer

patients had diabetes. Moreover, according to the studies of the National Cancer Institute, the risk factors include: being aged >60 years, cigarette smokers, sedentary lifestyles, diabetics, being male, family history and having inflammation of the pancreas.

DISCUSSION

The hypothesis of the relationship between diabetics and pancreatic cancer was proven false when data on 60 patients were analyzed. Of the 60 diabetics, 20 patients had a mother, father, or even a sibling that had some type of cancer. Smoking itself is known for its effect on insulin resistance. With that in mind, diabetics who smoke

decrease their chances of controlling health complications such as trouble breathing and tightness in chest. Three of the diabetics, both smokers and non smokers, had bronchitis. Because high triglycerides are often linked to diabetes, one way to control high levels of LDL is to exercise weekly. However, our community residents do not engage in physical activity as much as they should.

Finally, pancreatic cancer is a disease that is rarely found early because it carries no symptoms early on. The majority of the population diagnosed with pancreatic cancer does not live longer than five months. It is our hope that diseases like pancreatic cancer will some day be linked to risk factors that can be modified for improved health.