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Effect of smoking on fasting blood glucose level

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ABSTRACT

Objective: it is well known that smoking increases the risk of developing diabetes and induces increases on blood glucose level, so when people stop smoking we would expect better state. The present study was aimed to investigate the effect of smoking on the human blood glucose level of smokers and ex-smokers diabetic patients.

Research design: This experiment was conducted on diabetic center on Libya included 80 healthy chronic smokers and 80 healthy ex-smokers people. Fasting blood sugar test performed on each subject.

Results: Smoking acutely induces Fasting blood glucose level: the fasting glucose level of smokers was 127 ± 3.36 mg/dl (mean ± STD) during the smoking and 109 ± 6.4 mg/dl in the ex-smokers ($P < 0.05$).

Conclusion: Smoking acutely increases blood glucose level These findings support the pathogenetic role of cigarette smoking on cardiovascular risk factors of diabetic patient.

Key word: Fasting Blood sugar test, glucose level, smokers, ex-smokers.

1. INTRODUCTION

The main source of energy in the body is glucose. The brain cells and the nervous system not only depends on the level of blood sugar to produce energy but also can't finalized their function without the specified levels of glucose in the blood (1). Measurement of fasting blood sugar used to diagnose and evaluate diabetes, which is the most common disorders in our country. Most studies show the normal levels of fasting blood sugar from 90 to 130 mg/dl (2). The information that presents smoking as very bad for us is everywhere, but for diabetics, smoking can be even worse. Smoking is now proven to be an independent risk factor for diabetes, and amongst diabetics it increases the risk of complications. Diabetes complications already include heart disease, stroke and circulation problems (3). Smoking adds to the risk of developing all of these things. In some cases, smoking can double the likelihood of these conditions, as well as doubling the chances of suffering from kidney problems and erectile dysfunction. Smoking and diabetes both increase the risk of heart disease in very similar ways, and so when combined, they greatly exacerbate the chances of suffering a heart related condition such as a heart attack or stroke (4). Both high levels of glucose in the blood and smoking damage the walls of the arteries in such a way that fatty deposits can build up much easier. As this occurs, the blood vessels narrow and make circulating blood much harder. When this happens to the coronary arteries (the arteries that supply the heart muscle with blood and therefore oxygen) a heart attack can occur. Similarly, a stroke is when not enough blood can get to the brain, and so anything that may limit blood flow increases the risks of a stroke. High blood glucose levels also have this effect on the blood vessels and blood flow, so if you smoke when you have diabetes, you are putting yourself at a much greater risk of suffering a heart attack or stroke (5).

Smoking is also proven to be a risk factor for insulin resistance. Patients who are insulin resistant cannot use their bodily insulin properly. Together with genetics and obesity, smoking is one of the risk factors for insulin resistance. Insulin resistance often leads to diabetes. Smokers are 30–40% more likely to develop type 2 diabetes than nonsmokers. And people with diabetes who smoke are more likely than nonsmokers to have trouble with insulin dosing and with controlling their disease. The more cigarettes you smoke, the higher your risk for type 2 diabetes. No matter what type of diabetes you have, smoking makes your diabetes harder to control. If you have diabetes and you smoke, you are more likely to have serious health problems from diabetes (6). Glucose can be measured in whole blood or serum (ie, plasma). Earlier blood glucose was measured in whole blood. Nowadays serum is extracted from blood and glucose is measured in the serum. Whole blood and serum blood glucose is often different. Red blood cells have higher concentration of protein than serum and serum has higher water content and more dissolved glucose than whole blood (7).

METHODS

This study was conducted on 80 Libyan diabetic patients Aged between 25 to 40 years old during 2019. The cases were divided into 2 groups of 80 case each. Group A and B were the experimental groups (A group is 80 smokers people, B group is the same 80 ex-smokers), whereas the standard normal level of blood sugar served as a control. In the experimental groups there were cases of smokers healthy people. All groups A and B were males. All groups whom their clinical and laboratory investigations did not demonstrated Diabetic or any other disease. Our data, including: age, sex, nationality, height and weight were recorded. Blood samples were collected from peripheral blood (blood drops) and collected from each case three times, and we used the same machine. Fasting blood sugar was measured by (Blood Glucose Meter [Accu-Chek machine]). The statistical analysis was performed using Tukey post-hoc and correlation coefficient. The data were expressed as mean and standard error of mean (Mean± STD), and P value < 0.05 was considered as significant.

RESULTS

A total of 80 cases were evaluated in two groups. In each experimental group there were 80 Libyan. The youngest case was 25 years old and oldest was 40. The level of fasting blood sugar of cases is presented in Figure (1). The average blood glucose level was stated in blood from the group A 127 ± 3.36 mg/dl (mean ± STD). this was more than that the average fasting blood glucose of group b 109 ± 6.4 mg/dl in the ex-smokers (P < 0.05).

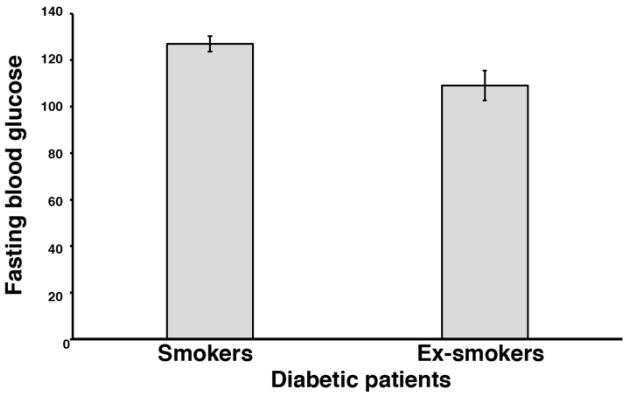

Figure.1. Fasting blood glucose level of each group

DISCUSSION

Smokers with diabetes have worse glycemic (blood sugar) control than nonsmokers, even with optimal self-monitoring. High blood sugar contributes to countless other health problems (8). In our study, we get the smokers have higher blood sugar than ex-smokers. On the positive side, studies have shown that the health benefits for people with diabetes who stop smoking begin immediately. These benefits continue to increase with the length of time a person remains smoke-free. Also, in our search, the levels of blood sugar became in the normal range when the cases stopped smoke. There have been many studies showings that smoking has harmful effects on patients with diabetes. Smoking increases diabetic incidence and aggravates glucose homeostasis and chronic diabetic complications.

Compared to non-smokers with diabetes, people with diabetes who smoke have twice the risk of premature death. Furthermore, the risk of complications associated with tobacco use and diabetes in combination is nearly 14 times higher than the risk of either smoking or diabetes alone (9). Smoking is associated with multiple complications of diabetes. Nephropathy (kidney disease) has been shown to be common in Type 1 diabetic patients who smoke and smoking increases the risk of albuminuria in both types of diabetes. (Albuminuria refers to the presence of protein in the urine and can indicate signs of kidney disease.) Another small study of 33 people with Type 2 diabetes with kidney disease found that smokers' kidney function declined more rapidly than that of non-smokers, despite drug treatment, suggesting that smoking cessation could slow the progression of kidney disease in people with diabetes who use ACE inhibitors. The relationship between cigarette smoking and retinopathy (disorders of the retina) is less well defined than that of other microvascular complications of diabetes. However, some studies have found an association between smoking and diabetic retinopathy. Smoking is also a documented risk factor for both the development and progression of various types of neuropathy (damage to the peripheral nervous system). A more recent prospective study found that cigarette smoking was associated with a 2-fold increase in risk (10).

CONCLUSION AND RECOMMENDATION

However, smoking prevention and smoking cessation may not be emphasized enough in diabetic clinics. Thus, educating patients on the importance of not smoking and engaging in smoking cessation programs are important strategies for the management of diabetes. People should be encouraged to regularly monitoring of blood glucose level. This will ensure that the treatment is working properly and will help prevent or delay the onset of complications. Regular monitoring of blood glucose levels need not be a hassle and plays an active part in your ability to maintain a happy, enjoyable life. Keeping on asking questions about blood glucose testing and keep practicing blood testing until patients feel confident and comfortable about tests technique. Several factors – including equipment faults and human error – may influence the reliability of glucose monitoring test results. That is why the results should be recorded in a record book and should be taken to diabetes advisers on each visit.

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