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HISTOLOGICAL FEATURES OF VASCULAR COMPLICATIONS OF THE LOWER EXTREMITIES IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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OBJECTIVES

The aim of the work was to investigate histological features of vascular complications of the lower extremity in patients with type 2 diabetes mellitus.

METHODOLOGY

We studied macroscopic and microscopic changes of lower extremity tissues of 7 cases of diabetic gangrene. We used common histological methods of staining with hematoxylin and eosin, Masson's trichrome and Hart's elastin stain.

RESULTS

The main histological features of the vascular complications of lower extremity in patients with type 2 diabetes mellitus were: atherosclerosis arteries and thrombus formation; calcification of the middle tunica of arteria, including large areas of calcification and many small areas and proliferation of endothelium; thinning of the epidermis; thickening and fragmentation of fibrous structures in the dermis; reduction in skin appendage; hyalinosis and vascular thrombosis. In diabetic gangrene, skin defects of various depths and areas are determined with microcirculatory disorders, stasis, thrombus formation, wall hyalinosis, accumulation of purulent exudate and tissue detritus in the interstitial tissue. Pathomorphological criteria for the viability of the lower extremity tissues in diabetic foot and gangrene are the patency of large vessels, the integrity and clear differentiation of tissue structures, the arterioles wall thickness in the range $18.5 \pm 1.5 \mu\text{m}$, the diameter – $29.7 \pm 0.8 \mu\text{m}$, Kernogan index – 0.67 ± 0.08 .

CONCLUSION

The main cause of disability and mortality in patients with diabetes mellitus is late vascular complications, including diabetic micro- and macroangiopathy of the lower extremities. Timely diagnosis of and adequate treatment can prevent the development of diabetic foot syndrome.

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EFFECT OF DIET ON CONTINUOUS GLUCOSE PROFILE OF HEALTHY INDIVIDUALS WITHOUT DIABETES

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OBJECTIVES

It is essential to understand continuous glucose monitoring (CGM) data in healthy subjects without diabetes which could serve as useful reference for interpretations of glucose measurements in diabetic patients. However, little is known about dietary impact on CGM data in studies of CGM in healthy individuals. We aim to characterise the effect of diet on interstitial glucose levels in healthy individuals without diabetes.

METHODOLOGY

We conducted a cross-sectional on 95 healthy volunteers without diabetes (mean age 34.9 ± 10.0 years) who underwent flash glucose monitoring using Freestyle Libre. Nutrient data collected from a food diary were analysed using FoodWorks Professional nutrient analysis software. Linear regression was performed to examine association between nutrient contents with peak glucose and 4-hr post-absorptive glucose levels, adjusting for demographics, body mass index, fasting plasma glucose and exercise.

RESULTS

The mean peak glucose and 4-hr post-absorptive glucose levels were 6.9 ± 1.7 and 4.6 ± 1.0 mmol/l. Higher levels of calorie, fat, carbohydrates and starch intake were associated with peak glucose levels in crude and fully adjusted analyses with adjusted coefficients 0.39 (95% CI 0.26-0.51; $p < 0.001$), 0.21 (95% CI 0.08-0.34; $p = 0.001$), 0.39 (95% CI 0.26-0.51; $p < 0.001$) and 0.41 (95% CI 0.12-0.38; $p < 0.001$) respectively. Higher levels of calorie, carbohydrates and sugar were associated with 4-hr post-absorptive glucose levels in crude and fully adjusted analyses with adjusted coefficients 0.13 (95% CI 0.06-0.21; $p = 0.001$), 0.12 (95% CI 0.04-0.20; $p = 0.002$) and 0.10 (95% CI 0.02-0.17; $p = 0.012$) respectively.

CONCLUSION

Meals with higher calorie, fat, carbohydrates and starch intake induced higher peak glucose levels. Meals with higher levels of calorie, carbohydrates and sugar intake induced higher post-absorptive glucose levels.