SUMMARY

Epidemiology of glucose metabolism disorders and their role in the pathogenesis of atherosclerosis.

INTRODUCTION: Diabetes remains a major public health priority due to its steadily increasing prevalence and serious health and social consequences. Diabetes mellitus type 2 (DMt2) affects more than 6% of the global population, equivalent to approximately 537 million people. Prediabetes is an intermediate state with elevated blood glucose parameters above normal, but below the threshold for DMt2. Prediabetes includes impaired fasting glycaemia (IFG) or impaired glucose tolerance (IGT). This condition is classified as dysglycaemia and is a prelude to DMt2. The early diagnosis of a prediabetes is of crucial clinical importance - indicating the possibility of providing early intervention in patients with an increased risk of cardiovascular disease.

THE AIM: The aim of the study was to assess the prevalence of DMt2 and prediabetes in a population of patients with chronic coronary syndrome (CCS) as well as in the general population. Additionally, the underlying determinants of the presence of impaired glucose metabolism in the mentioned populations were identified.

MATERIALS AND METHODS: Two populations were included in the study. The population of the multicentre cross-sectional POLASPIRE study, which consisted of patients with CCS - who were examined between 6 and 18 months after acute coronary syndrome, unstable angina, percutaneous coronary intervention or coronary artery bypass surgery. The second group consisted of subjects randomly selected from the general population of Bialystok residents as part of the BIAŁYSTOK PLUS cohort project.

RESULTS: In the first analysis, a total of 1233 patients with CCS were enrolled, the mean age was 69.9 ± 8.4 years and 71% of participants were male. DMt2 was diagnosed in 479 (43.1%) before hospitalization based on medical records. On the basis of the OGTT performed, 28 new diagnoses of DMt2 were made in 546 patients (5.1%), of whom 21 (75%) were men. Prediabetes in the study population was found in 395 (72.3%) cases - isolated IFG in 234 (42.9%) and IGT in 161 (29.5%). Subjects with fasting glucose within normal limits or with isolated IFG alone who were diagnosed with DMt2 accounted for 3.11% (n = 17). Similarly, participants with a diagnosis of IGT with fasting blood glucose below 125 mg/dl represented 24.7% (n = 135). The groups with and without DMt2 differed significantly in terms of lifestyle changes after the hospitalisation. Specifically, more people with previously diagnosed DMt2

chose to reduce their fat intake (p<0.01), as well as sugar (p<0.01) and alcohol (p=0.03) in the last year. Multinomial logistic regression analyses were performed to estimate possible predictors of the development of dysglycaemia in the period after a cardiovascular event. The multivariate model showed that the odds of prediabetes compared with normoglycaemia were 1.123 (CI): 1.042-1.209) times higher for each unit of BMI measured during hospitalisation. The model with independent variables HDL-C and BMI indicated that the odds of prediabetes multiplied by 1.114 (CI: 1.035-1.198) for each increase of BMI units; the odds of DM were lower among patients with higher HDL-C levels compared with normoglycaemia (OR = 0.145, CI: 0.038-0.546). ROC curve analysis confirmed that BMI during hospitalisation was a predictor of developing dysglycaemia (AUC = 0.63; CI: 0.563-0.704).

Another analysis included 1051 participants included in the Bialystok PLUS cohort study. Medical history data revealed 75 cases of DMt2, representing 7.14% of the total. On the basis of laboratory tests, we found that prediabetes was present in 410 subjects (approximately 40%). We identified a population group without impaired glucose metabolism, which represented 47.1% (n = 495). Participants with IFG represented 22.93% (n = 241) and those with IGT 16.1% (n = 169). Among these patients, we detected 104 patients with both IGT and IFG (25.37% of all those with a prediabetes). In addition, DMt2 was diagnosed in 6.76% (n = 71) of individuals based on OGTT. Among this group, 62% (n = 44) had a fasting blood glucose below 126 mg/dl, suggesting that the OGTT should be performed routinely for the diagnosis of glucose metabolism disorders. We have extracted parameters by analysing the available data, which may help to differentiate the newly diagnosed DMt2 from the population without impaired glucose metabolism. BMI can be used as an indicator to differentiate the group with DMt2 from patients without impaired glucose metabolism (p<0.01). The ratio of total lean mass to fat mass was significantly different between the group with newly diagnosed DMt2 and the group of patients without impaired glucose metabolism (p<0.05).

CONCLUSIONS: The findings indicate a very high prevalence of impaired glucose metabolism, both in the general population and in CCS patients. Our results suggest that OGTT should be considered in all patients with CCS. The factors that indicate predisposition to develop DMt2 in patients with CCS are high BMI and reduced HDL-C levels.

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