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Editor

Komarytskyy M.L.

Ph.D. in Economics, Associate Professor

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e-mail: sweden@sci-conf.com.ua

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THE RISK OF STROKE DEVELOPMENT IN PATIENTS WITH DIABETES MELLITUS

Blahodyr Anhelika,

Student

Viun Tetiana,

Ph.D., Assistant,

Department of General Practice

Family Medicine and Internal Diseases

Kharkiv National Medical University

Introduction. Cardiovascular diseases, including stroke, are the most wide spread complications, which significantly increase mortality in patients with diabetes mellitus (DM) [1]. According to the International Diabetes Federation (IDF) data, in 2021 there were 573 million people in the world who lived with DM. This figure is expected to rise and it will have achieved 643 million by 2030 and 783 million by 2045. Additionally, in 2021 there were spent at least 966 billion dollars on DM, and over the last 15 years this number has been grown by 316% [2]. DM complications could lead not only to permanent disability, but also to death at young age which is a serious social and economic issue.

Aim. To investigate the primary prevention methods and stroke treatment in patients with DM.

Materials and methods. During the investigation there was conducted a retrospective analysis of literary sources, such as articles and conferences proceedings devoted to the problem.

Results and discussion. There are significant differences in stroke development among patients with DM and conditionally healthy people. Patients with DM have higher ischemic stroke percentage comparing to haemorrhagic and lacunar strokes due to microcirculation damage and associated arterial hypertension (AHT) in patients of this group [3-4].

AHT is serious risk factor which can be controlled, especially in patients with DM. Diabetes Control and Complications Trial//Epidemiology of Diabetes

Interventions and Complications (DCCT/EDIC) showed that the rise of glycated haemoglobin (HbA1c) increases the AHT risk by 25%. However, intensive correction of glycaemic index level reduces long-term AHT risk only by 24%. Consequently, standard cardiovascular risk factors are of greater importance on condition of improved glycemic control [5]. Pharmacotherapy should include a renin-angiotensin system antagonist, such as angiotensin-receptor blocker or ACE-inhibitor. Furthermore, antihypertensive agents include beta-blockers, calcium channel antagonists and diuretics [6-7].

Obesity is a critical problem around the world. According to the data in World Obesity Atlas 2023, over the next 12 years 51% world's population (more than 4 billion people) will be living with excess weight or obesity, if the prevention and treatment of DM isn't improved [8]. Obesity increases the risk of type 2 DM (T2DM) development, coronary heart disease and stroke. Moreover, obesity is associated with metabolic syndrome development, including dyslipidaemia, AHT, hyperinsulinaemia and insulin resistance, which carry significant cardiovascular risk. Weight reduction by 5% and more improves DM and AHT control, along with decreasing other metabolic risk factors [9]. The LOOK AHEAD research group explored the intensive life-style modification role, which involved healthy diet with caloric intake from 1200 kcal to 1800 kcal per day (<30% of calories from fat and >50% calories from protein) and at least 175 minutes of moderately intense physical activity per week. It has been found that the intensive life-style modification led to more persistent weight reduction than in control group. Nevertheless, such weight loss has not decreased the cardiovascular diseases and mortality level in overweight and obese adults with T2DM during 10-year observation [10].

Heart Protection Study and Collaborative Atorvastatin Diabetes Study have revealed that statins reduce cardiovascular risk in patients with DM through reducing low-density lipoproteins (LDL) level [11]. The stroke incidence was considerably higher in patients with DM and impaired fasting glucose, and dyslipidaemia treatment was more efficient for secondary prevention in these groups in comparison with patients with normal fasting glucose [12]. Statin therapy should be considered

routinely for all the patients with DM over 40 years and earlier in high-risk groups, regardless of cholesterol initial concentration [13].

Conclusion. Patients with DM have higher stroke development risk and death rate. Proper glycaemic control when first diagnosed DM, regardless of diabetes type, is essential for hyperglycaemia-induced pathogenic processes reduction, which are connected to atherosclerotic vascular disease. Moreover, long-term strict glycaemic control improves cardiovascular outcomes, therefore further correction of cardiovascular system's risk factors is essential.

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