УДК 616.12-008.313.2:616.379-008.64-06

C. Uzomefuna, C. Uzomefuna

Scientific supervisor: T. A. Kurman

Educational Establishment
"Gomel State Medical University"
Gomel, Republic of Belarus

COMPLICATIONS OF DIABETES MELLITUS

Introduction

The prevalence of diabetes mellitus has reached epidemic proportions worldwide, making it one of the biggest global health challenges of the twenty-first century. The International Diabetes Federation estimates that 537 million adults had diabetes in 2021and by 2045, that figure is expected to increase to 783 million [1]. Diabetes's chronic consequences, which gradually impact several organ systems, are the main cause of its clinical relevance, which goes well beyond the metabolic disorder itself. These complications can be broadly divided into two categories: macrovascular complications, which include peripheral artery disease, coronary artery disease, and cerebrovascular disease, and microvascular complications, which include diabetic nephropathy, retinopathy, and neuropathy [2]. Chronic hyperglycemia, oxidative stress, accumulation of advanced glycation end products, inflammatory pathways, and extensive endothelial dysfunction are all intricately intertwined in the pathophysiological mechanisms driving these consequences [3].

Diabetes increases the risk of coronary artery disease, myocardial infarction, and stroke by two to four times, making cardiovascular disease the primary cause of morbidity and death among diabetic individuals. Since diabetes individuals are much more likely to develop both heart failure with intact ejection fraction and heart failure with reduced ejection fraction, heart failure in particular has received more attention [4]. Another terrible consequence is diabetic kidney disease, which affects 20 to 40 percent of diabetes individuals and is the primary cause of end-stage kidney disease globally [5].Diabetes-related neuropathic consequences impact the peripheral and autonomic nerve systems, resulting in significant morbidity such as lower extremity amputations, foot ulcers, chronic pain, and autonomic dysfunction [6].

Goal

To measure the frequency of microvascular complications such as diabetic kidney disease, diabetic neuropathy, and diabetic retinopathy, as well as major cardiovascular complications such as hypertension, coronary artery disease, heart failure, cerebrovascular disease, and peripheral artery disease.

Material and methods of research

Discharge reports from patients admitted to Gomel City Clinical Hospital № 3's Cardiology Department between October 1 and November 30, 2025, were examined in this retrospective case study. Diabetes mellitus was diagnosed in the medical records of every patient who was part of the analysis. A standardised data collecting form was used to obtain comprehensive data from the discharge summaries that were submitted. Age and gender were among the demographic data gathered. When available, diabetes-specific data included glycated haemoglobin levels, fasting plasma glucose levels, the type of diabetes that was documented, and the length of the illness.

The results of the research and their discussion

From the discharge reports, 68 patients with diabetes mellitus were found. With 38 female patients making up 55.9% of the cohort and 30 male patients making up 44.1%, the demographic distribution showed a feminine majority. The age distribution revealed that 61 patients, or 89.7%

of the entire cohort, were 60 years of age or older. The age group of 60 to 69 years old had the highest incidence with 26 patients (38.2%), closely followed by the age group of 70 to 79 years old with 22cases (32.4%). The patients who were 80 years and above were 13 (19.1%) of the total, while 5 patients, (7.4%) of the total, were between the ages of 50 and 59. Just 2 cases (2.9%) of the total, were younger than 50.

The most common type of diabetes complications found were that of the cardiovascular system. 64 individuals (94.1%) of the total, had hypertension and 58 (85.3%) patients of the cohort, had coronary artery disease. Of them, 54 (79.4%) had particular atherosclerotic cardiosclerosis whilst 8 (11.8%) individuals had a history of myocardial infarction. Heart failure of any stage was seen in 55 (80.9%) patients. Of the patients with heart failure, 21 (30.9%) of them, had heart failure with reduced ejection fraction, and 34 (50.0%) of them, had heart failure with intact ejection fraction. Nine individuals (13.2%) of the cohort, had a history of cerebrovascular illness while the individuals whohad peripheral artery disease were 7 (10.3%) of the total. Renal impairment was a key finding in this study. The estimated glomerular filtration rate ranged from 43 to 76 mL/min, with a mean of 59 mL/min. Twenty-six individuals, (38.2%) of the group, had stage 3a or higher chronic renal disease. 16 patients (23.5%) of the cohort, had diabetic polyneuropathy while 12 individuals, (17.6%) of the cohort, had diabetic retinopathy.

Other comorbidities included 58 (85.3%) patients with dyslipidaemia and 21 (30.9%) of them with documented obesity. The significant degree of disease clustering was one of the study's main findings. 44 individuals representing 64.7% of the whole group, had multiorgan involvement, which is defined as problems impacting three or more organ systems.

Conclusions

With a mean age of 66.8 years and almost 90% of patients 60 years or older, diabetes complications primarily affect older persons. The clinical picture is dominated by cardiovascular disease with a major prevalence of hypertension, coronary artery disease and heart failure. The average patient is at the threshold of stage 3a chronic renal disease with a mean estimated glomerular filtration rate of 59 mL/min. Diabetic polyneuropathy and diabetic retinopathy are two prevalent and probably underdiagnosed microvascular disorders that indicate extensive systemic microvascular damage. The comorbidities consisting of dyslipidemia and obesity constitute important modifiable risk factors that need to be aggressively managed. Multiorgan involvement reveals that diabetes is a systemic disease that requires a multidisciplinary approach for effective treatment.

LITERATURE

1. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045 / H. Sun, P. Saeedi, S. Karuranga [et al.]. // Diabetes Research and Clinical Practice. – 2022. – Vol. 183. – P. 1091.

2. Standards of medical care in diabetes / American Diabetes Association // Diabetes Care. – 2024. – Vol. 47, Suppl. 1. – P. 1–300.

3. Forbes, J. M. Mechanisms of diabetic complications / J. M. Forbes, M. E. Cooper // Physiological Reviews. – 2022. – Vol. 102, № 3. – P. 1245–1289.

4. Heart failure with preserved ejection fraction and diabetes: JACC state-of-the-art review / K. McHugh, A. D. DeVore, J. Wu [et al.]. // Journal of the American College of Cardiology. – 2021. – Vol. 77, № 18. – P. 2284–2300.

5. Molecular mechanisms and therapeutic targets for diabetic kidney disease / K. R. Tuttle, R. Agarwal, C. E. Alpers [et al.]. // Kidney International. – 2022. – Vol. 101, № 4. – P. 682–699.

6. Emergency conditions in internal organs diseases : a textbook for international students of higher education institutions majoring in General Medicine / E. G. Malaeva, T. V. Aleinikova, O. A. Yarmolenko, T. A. Kurman. – Gomel : Gomel State Medical University, 2025. – 283 p.