

Original article

Clinical and Laboratory Characteristics of Elderly Patients with Type 2 Diabetes Mellitus in Samara, Russia: A Registry-Based Study

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Abstract: Relevance — A comprehensive analysis of standard inpatient monitoring indicators for Diabetes Mellitus (DM) accessible to physicians during routine outpatient visits provides valuable insights within the context of a registry-based study. This approach is scientifically significant as it enables the identification of patterns in the interplay between comorbidities and vascular complications of diabetes in elderly patients, along with key factors driving their progression.

Aim — To conduct a comprehensive epidemiological assessment of the clinical and metabolic profiles of elderly outpatients with Type 2 Diabetes Mellitus (T2DM) in Samara, based on a registry study.

Material and Methods — This retrospective study analyzed data from 837 outpatient consultation records of 484 elderly patients with T2DM, aged 60 to 74.9 years. The data were stored in a local registry utilizing specialized digital tools and a formalized protocol. Epidemiological indicators, parameters of therapeutic control of diabetes, frequency of target achievement, and drug therapy regimens were evaluated.

Results and Conclusion — The study revealed a high prevalence of cardiovascular complications in Diabetes Mellitus (DM), closely linked to the frequency of atherogenic comorbidities such as hypertension, obesity, and dyslipidemia. These conditions are driven by pronounced insulin resistance and metabolic syndrome, which are characteristic of the elderly population. The achievement of therapeutic control targets — glycated hemoglobin (HbA1c), blood glucose levels, and systolic blood pressure (SBP) — was generally unsatisfactory. Additionally, although drug therapy was frequently prescribed, it often failed to adequately address the pronounced manifestations of concomitant metabolic syndrome. The findings support optimizing guidelines for outpatient monitoring of elderly patients with T2DM through a multidisciplinary team approach, mandating the involvement of a cardiology specialist.

Keywords: Type 2 Diabetes Mellitus (T2DM), elderly, vascular complications of Diabetes Mellitus (DM), comorbidities, indicators of therapeutic control of Diabetes Mellitus (DM).

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Introduction

The exponential increase in the prevalence of chronic non-communicable diseases, closely linked to the global trend of population aging, has garnered significant scientific attention. According to the World Health Organization (WHO), these diseases represent one of the leading public health threats in developed countries [1]. Diabetes Mellitus (DM) and its macrovascular complications are prominent among age-associated pathologies. These complications manifest as atherosclerosis in various vascular territories. Many researchers agree that these conditions, particularly when coexisting with Arterial Hypertension (AH), represent a primary barrier to extending active life expectancy globally [2] and nationally [3].

The social and medical significance of this issue is underscored by epidemiological data. According to the Federal Diabetes Register, as of December 2024, there were 5,290,851 individuals diagnosed with diabetes mellitus in the Russian Federation, representing 3.4% of the population. Of these, 4,882,888 (92.3%)

had Type 2 Diabetes Mellitus (T2DM). Elderly individuals constitute 81.9% of the T2DM patient population [4], meaning that, by the most optimistic estimate, over 3.99 million Russians aged 60 and older (6.12% of the elderly population) are affected by this disease. Considering data from the national epidemiological NATION study, the prevalence of undiagnosed carbohydrate metabolism disorders among the elderly may exceed 6.05% [5]. Taken together, these findings suggest that over 12% of the elderly population likely exhibits some degree of impaired glucose tolerance or overt diabetes, placing them at markedly increased cardiovascular risk. This is further supported by mortality data in patients with T2DM: cardiovascular diseases remain the leading cause of death, accounting for 52.1% of fatalities according to official statistics [6].

A distinctive feature of the present study is its registry-based design. Compared to randomized controlled trials (RCTs), observational registry studies offer significant advantages by enabling broad coverage of diverse clinical and metabolic factors encountered in real-world clinical practice. Moreover, they allow

for an objective assessment of the influence of these factors on the course and progression of the pathological process [7, 8].

It is noteworthy that registry-based approaches have long been, and continue to be, successfully employed in diabetes research, particularly in Scandinavian countries [9]. Additionally, in cardiology, registries are widely used to evaluate the efficacy and safety of pharmacological treatments [10].

According to the international clinical trial database ClinicalTrials.gov, over 450,000 clinical studies using registry data were registered worldwide in 2023. Researchers favor this methodology for several reasons. First, organizing a randomized controlled trial (RCT) is methodologically complex and financially demanding. RCTs typically focus on investigating one or two specific questions, such as assessing the sensitivity and specificity of a diagnostic method or evaluating the efficacy and safety of a therapeutic intervention. Elderly patients with T2DM are frequently polymorbid; carbohydrate metabolism disorders are often accompanied by conditions characteristic of metabolic syndrome, including hypertension, obesity, dyslipidemia, and various manifestations of atherosclerosis, all closely associated with aging. Despite the shared primary pathogenetic mechanisms underlying these conditions, a comprehensive evaluation of their developmental patterns and progression requires analysis of a broad range of factors, including anamnesis, clinical findings, laboratory results, instrumental assessments, and other relevant data. Defining and clinically substantiating the characteristics of the clinical and laboratory profile of elderly patients with T2DM – based on analysis of standard parameters from routine outpatient diabetes monitoring available to physicians – is of considerable interest.

Aim: To conduct a comprehensive epidemiological assessment of the clinical and metabolic profile of elderly outpatients with Type 2 Diabetes Mellitus (T2DM) in Samara, Russia, utilizing a registry-based study design.

To achieve this aim, the following objectives were established: to characterize the descriptive statistics of epidemiological, anamnesis, clinical, and laboratory-instrumental parameters among elderly patients with T2DM, focusing on the following aspects:

- 1) To assess the prevalence of macrovascular and microvascular complications, as well as common comorbidities – including hypertension, obesity, and dyslipidemia – in elderly patients with T2DM;
- 2) To determine the mean values of biomarkers reflecting glycemic, lipid, and hemodynamic control – including HbA1c, Low-Density Lipoprotein Cholesterol (LDL-C), Systolic Blood Pressure (SBP), and Diastolic Blood Pressure (DBP) – in elderly patients with T2DM;
- 3) To evaluate the frequency with which elderly patients with T2DM achieve target glycemic control ranges;
- 4) To describe the pharmacological treatment profiles of elderly patients with T2DM.

Material and Methods

A selective, observational, registry-based epidemiological study with a retrospective design was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. The study protocol was approved by the Bioethics Committee of Samara State Medical

University (Protocol No. 199, dated April 3, 2019). The study was conducted at two clinical sites representing different ownership types: Samara Municipal Polyclinic No. 4, Kirovsky District, and the private treatment and diagnostic center “Our Doctor” LLC. Clinical data were collected from May 24, 2018, to September 29, 2024.

Participant Characteristics

In line with the study objectives, a sample of 484 elderly outpatients with a confirmed diagnosis of T2DM was randomly selected. The cohort comprised all patients who met the eligibility criteria and had at least one endocrinology appointment during the study period, reflecting the registry-based nature of the study. Primary data for all participants is included in the Federal Diabetes Register and the Unified State Health System database (since 2022).

Inclusion Criteria: Patients aged 60 to 74.9 years with a confirmed diagnosis of T2DM receiving outpatient care at the study’s clinical sites.

Exclusion Criteria: (1) Type 1 Diabetes Mellitus (T1DM) or unclassified Diabetes Mellitus. (2) Lack of voluntary informed consent for the provision of primary health care.

The clinical characteristics of the overall study sample are summarized in [Table 1](#).

Clinical and Laboratory-Instrumental Examination

All study participants were recommended to undergo examinations consistent with the guidelines applicable at the time of consultation [11, 12]. Clinical procedures were fully performed, and laboratory and instrumental parameters for dispensary monitoring of diabetic patients were recorded according to availability and insurance approval.

Collection of Clinical Material

Primary medical data collection was facilitated by a digital tool: the software “Endocrinologist’s Automated Workplace ARME 2.0” [13], which enables systematization and storage of data on a digital medium during outpatient visits. A dedicated matrix of the formalized outpatient consultation protocol, covering 108 variables, was developed for the software. This matrix allows patient identification and determination of clinical and laboratory profile parameters included in the standard dispensary observation [14].

Table 1. Clinical Characteristics of the Study Population

Characteristic	Value
Participants, <i>n</i>	484
Gender (male/female), <i>n</i> (%)	154/330 (31.8/68.2)
Average Age, years	66.48±4.10
Duration of Diabetes Mellitus (DM), years	9.96±8.80
Duration of Hypertension, years	15.67±11.09
Body Mass Index (BMI), kg/m ²	31.90±6.01
Glycated Hemoglobin (HbA1c), %	8.31±2.24
Serum Creatinine, μmol/L	92.83±30.59
Glomerular Filtration Rate (GFR) CKD-EPI (ml/min/1.73 m ²)	65.73±17.86

Data are presented as absolute numbers (*n*), percentages (%), means, and standard deviations (mean±SD).

To preserve and systematize primary medical information, the second component of the digital system – a specialized database – was employed [15]. The primary data were uploaded to a Microsoft Excel file using automation tools based on a generated and saved query script.

The third component of the system comprises medical decision support modules that provide automated calculation of indicators such as Body Mass Index (BMI), Glomerular Filtration Rate (GFR, calculated using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) formula), stages of Obesity and Chronic Kidney Disease (CKD), Hypertension risk group, target values of HbA1c, Blood Pressure (BP), Low-Density Lipoprotein (LDL), SCORE2 risk, and others. Digital clinical calculators are accessible to physicians of all specialties at <https://кафэндгр.рф/>.

Table 2. Consultations of Patients with Endocrine Diseases Registered in the Local Register of the ARME

Nosological Form	Number of Consultations, n	Number of Patients, n
Carbohydrate Metabolism Disorders	1,908	1,261
– Elderly Patients with T2DM	837	484
Thyroid Diseases	3,741	1,802
Combined Pathology*	268	171
Total	5,917	3,234

*Combined pathology includes patients with both thyroid disease and diabetes. Data are presented as absolute numbers of cases.

Table 3. Prevalence of Complications and Comorbid Conditions in Elderly Patients with T2DM

Nosological Form	n	% in Group
Chronic Kidney Disease (CKD)	71	14.7
– Stages 3a-5	60	12.4
Retinopathy	314	64.9
– Patients Undergoing Laser Coagulation	36	5.4
Polyneuropathy	439	90.7
– Patients with Diabetic Foot (DF)	9	1.9
Coronary Heart Disease (CHD)	205	42.4
– Patients with Angina Pectoris of the 2nd-3rd Functional Class	172	35.5
– Patients with Acute Myocardial Infarction (AMI) in Anamnesis	61	12.6
– Patients with Confirmed Diagnosis of Chronic Heart Failure (CHF) of All Stages	196	40.5
– History of Stroke	55	11.4
– Chronic Obliterating Disease of the Lower Limb Arteries (CODILLA)	49	10.1
Arterial Hypertension (AH)	425	87.8
Obesity	289	60.2
Dyslipidemia	399	82.4

Table 4. Indicators of Therapeutic Control in Elderly Patients with T2DM

Clinical Parameter	Mean ± Standard Deviation (M±SD)
Glycated Hemoglobin (HbA1c), %	8.36±2.01
Delta HbA1c = HbA1c – Target Level (TL), %	1.10±1.79
Glycemia at Reception, mmol/L	9.00±3.38
Self-Monitoring of Glycemia Minimum, mmol/L	6.64±2.23
Self-Monitoring of Glycemia Maximum, mmol/L	13.60±4.70
Glycemic Variability, mmol/L	7.00±4.21
Total Cholesterol, mmol/L	4.78±1.36
Low-Density Lipoprotein (LDL), mmol/L	2.58±1.21
Systolic Blood Pressure (SBP) Office, mm Hg	134.27±9.98
Diastolic Blood Pressure (DBP) Office, mm Hg	80.14±2.98

Statistical Analysis

For statistical analysis and mathematical modeling, specialized software SPSS 26.0 (IBM Corporation, Armonk, New York, USA) was utilized. Nominal variables were encoded numerically with corresponding labels assigned. The text field values for drug therapy were validated using a nominal scale categorized by drug classes. Nominal variables were described by the number of observations and their percentage of the group size.

Normality of distribution for quantitative variables was assessed using a grapho-analytical method involving visual inspection of histograms, as well as the Shapiro-Wilk and Kolmogorov-Smirnov tests with the Lilliefors correction. The prevalence of diabetic complications and comorbid conditions was calculated using a standard formula. The frequency of achieving target therapeutic control values for diabetes mellitus was determined based on threshold values estimated by the original digital clinical calculator available at <https://кафэндгр.рф/сппвр-терапии-пожилых-пациентов/терапевтические-цели-сд2/> [16].

Results

Data accumulation in the local register of the ARME database occurs in real time during the provision of medical care to patients; therefore, its volume is dynamic. At the time of study completion (October 2024), the number of unique consultations for patients with endocrine diseases recorded in the database using various generations and modifications of ARME totaled 5,917 cases ([Table 2](#)).

The ARME database sample of patients with carbohydrate metabolism disorders includes the following nosological forms: Type 2 Diabetes Mellitus (T2DM, E11), Type 1 Diabetes Mellitus (T1DM, E10), Gestational Diabetes Mellitus (GDM, O24.4, O24.9), and Impaired Carbohydrate Tolerance (R73.0). According to the data obtained, elderly patients with T2DM accounted for 38.4% of the total number of registered diabetes mellitus patients.

The key factor determining quality of life and prognosis in elderly patients with T2DM is the presence and severity of microvascular and macrovascular complications. The prevalence of these complications in the sample is presented in [Table 3](#).

The nominal variable Chronic Kidney Disease (CKD) was determined based on available dispensary monitoring data as a previously established diagnosis. Chronic Kidney Disease (CKD) stages 3a-5 were estimated using the Glomerular Filtration Rate (GFR), calculated by the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) formula. It should be noted that the actual coverage of creatinine measurements in the study group was insufficient, amounting to 29.8%; microalbuminuria was assessed in only 11.8% of participants.

The vast majority of elderly patients with T2DM exhibited polymorphic macro- and microvascular complications: diabetic retinopathy and polyneuropathy were registered in more than 50% of participants; chronic forms of coronary heart disease (CHD) were noted in 42.4%. Acute cardiovascular events – acute myocardial infarction (AMI) and stroke – were present in the medical history of 107 patients (22.1%), with 9 patients (1.9%) exhibiting both types of lesions. The spectrum of comorbid pathologies included all components of metabolic syndrome: arterial hypertension (AH), obesity, and dyslipidemia were recorded in over 60% of participants, significantly impacting the progression of atherosclerosis and cardiovascular risk.

Table 5. Frequency of Achieving Target Glycemic Control Levels in Elderly Patients with Type 2 Diabetes Mellitus (T2DM)

Clinical Parameter	n	% in Group**
Glycated Hemoglobin (HbA1c) < 7.5%	84	43.3
Fasting Glycemia (Laboratory) < 7.5 mmol/L*	184	39.1
Hypoglycemia During the Day	24	5.0
Hypoglycemia at Night	17	3.5

* indicates correspondence to HbA1c<7.5%; ** represents the valid percentage among surveyed participants.

Table 6. Structure of Drug Therapy in Elderly Patients with Type 2 Diabetes Mellitus (T2DM)

Group of Drugs	n	% in Group
History of Insulin	198	40.9
Currently on Insulin	226	46.7
Sulfonylureas	192	39.7
Biguanides	309	63.8
Inhibitors of Dipeptidyl Peptidase 4 (iDPP-4)	28	5.8
Sodium-Glucose Cotransporter-2 Inhibitor (SGLT-2)	47	9.7
Monotherapy	197	40.7
Two Tablets	171	35.3
Three or More Tablets	12	2.5

The development and progression of diabetes mellitus complications have a close pathogenetic relationship with the level of therapeutic disease control. The average values of glycemic and lipid metabolism parameters, as well as blood pressure (BP) levels, in the study sample are presented in [Table 4](#).

The most important clinical parameters determining the choice of treatment strategy for a patient with T2DM, indications for its correction and intensification, and regulations for dispensary monitoring are the achievement of glycemic, lipidemic, and hemodynamic control goals. As noted in studies by the National Medical Research Center of Endocrinology of the Russian Federation [17], from the standpoint of evidence-based medicine, the difference (delta HbA1c) between the actual HbA1c level and its target value (TL) is a primary criterion for assessing the effectiveness of medical care in DM. The data obtained in our study demonstrate that the mean delta HbA1c values of participants (1.10±1.79%, median 0.27 [0.00; 2.30]) differ significantly from the target, indicating poor glycemic control among elderly patients with T2DM. This finding is confirmed by the average absolute HbA1c level (8.36±2.01%), glycemia at reception (9.00±3.38 mmol/L), and its high variability during self-monitoring (7.00±4.21 mmol/L). One of the most important parameters of the lipidemic profile, low-density lipoprotein (LDL), also falls outside the target range; its average value is 2.58±1.21 mmol/L, nearly twice the maximum target level. According to current clinical guidelines, the target systolic blood pressure (SBP) level, regardless of age, is 120-130 mm Hg. Although the mean SBP in the sample (134.27±9.98 mm Hg) is close to this range, only 20.2% of patients achieved the therapeutic SBP goals.

The primary goal of treating patients with DM, regardless of age, is to achieve glycemic control targets. The data obtained in this study are presented in [Table 5](#).

For the majority of sample participants, the target HbA1c value – taking into account age-related changes and target organ damage – was set at 7.5%. Consequently, the relative proportion of patients achieving compensation for this indicator was calculated based on this threshold. The current concept of diabetes mellitus treatment involves individualized determination of target fasting and postprandial glycemia values without

specifying absolute thresholds; therefore, 7.5 mmol/L was selected as the cutoff point for fasting glycemia, corresponding to an HbA1c of 7.5% [18]. Given that hypoglycemic episodes are particularly hazardous for elderly patients and significantly impact cardiovascular mortality [19], they were also analyzed as parameters of adequate glycemic control. It is noteworthy that the frequency of “dangerous” nocturnal hypoglycemia in the elderly was low, occurring in only 3.5% of participants.

An analysis of medications used to control carbohydrate metabolism in elderly patients with T2DM is presented in [Table 6](#).

The notably high proportion of elderly patients with T2DM receiving insulin therapy – reaching 46.7% – can be explained by the inclusion in the study sample of all patients who sought specialized care from an endocrinologist at a medical institution. In routine clinical practice, patients with milder forms of diabetes mellitus who are in a compensated state and without significant comorbidities are typically managed by general practitioners and primary care physicians. The average insulin dosage among patients was 39.23±22.23 units. Among oral hypoglycemic agents, biguanides were the most commonly prescribed (63.8%), followed by sulfonylureas (39.7%) and sodium-glucose cotransporter-2 inhibitors (SGLT-2 inhibitors) (9.7%). Most patients received monotherapy (40.7%) or dual therapy (35.3%). Instances of polypharmacy were infrequent, occurring in only 2.5% of cases. Data analysis indicates that, in some cases, irrational drug therapy regimens were employed.

Discussion

The data obtained are cause for serious concern and indicate that, in the vast majority of clinical cases, elderly patients with Type 2 Diabetes Mellitus (T2DM) referred to an endocrinologist are polymorbid and require specialized care from a multidisciplinary team of physicians [20]. While in the early stages of diabetes mellitus, the primary responsibility for prescribing appropriate hypoglycemic therapy and preventing complication progression largely rests with the endocrinologist; at later, advanced stages typical of older age, patients require regular follow-up and intensive management by cardiologists. This concept was clearly articulated and supported during the presentation by Professor V.Y. Mareev at the 25th National Congress with international participation, “Heart Failure 2024.”

Cardiovascular diseases and macrovascular complications primarily determine the severity of clinical presentation and outcomes of diabetes in elderly patients. The pattern of complications and comorbidities observed in elderly patients with T2DM in this study generally aligns with epidemiological data from the Federal Diabetes Register [4] and international sources [21, 22].

Notably, the local ARME registry reports high prevalence rates of arterial hypertension (AH) at 87.8%, chronic coronary heart disease (CHD) at 42.4%, and chronic heart failure (CHF) at 40.4%, which are significantly higher than the corresponding rates reported for the Russian Federation as a whole [23]. These differences can be attributed to two main factors: (1) the ARME registry sample is not fully representative of the general T2DM population, as it predominantly includes patients with severe, decompensated diabetes who are referred to endocrinologists, whereas patients with a stable disease course are typically managed by general practitioners; (2) findings from the multicenter randomized Russian epidemiological study “EPOCH-

CHF,” which encompassed 43 regions across the Russian Federation, indicate a steady increase in chronic heart failure (CHF) prevalence. Between 2002 and 2017, the prevalence rose by 22%, with estimates suggesting that the prevalence in the general Russian population (excluding diabetes and age factors) may reach 10% [24]. What underlies the high comorbidity burden observed in elderly patients with T2DM? It is important to note that the most severe comorbidities originate from a common pathogenetic mechanism – insulin resistance – which ultimately results in the pronounced manifestations of metabolic syndrome observed in the ARME database, including hypertension (87.8%), obesity (60.2%), and dyslipidemia (82.4%).

An analysis of the indicators related to the achievement of therapeutic goals in diabetes mellitus treatment among elderly patients yields a disappointing conclusion: the majority fail to meet the target parameters for key conventional risk factors, resulting in a significantly elevated probability of adverse cardiovascular outcomes. While the relative proportion of patients exhibiting satisfactory glycemic control of DM in the study sample was relatively substantial at 43.3% (as measured by HbA1c), the frequency of achieving target systolic blood pressure (SBP) values was only 20.2%. Moreover, the critical parameter for cardiovascular risk, low-density lipoprotein (LDL) cholesterol, averaged 2.58 ± 1.21 mmol/L, nearly double the recommended safe concentration. This finding further underscores the critical importance of normalizing the lipidemic and hemodynamic profiles in comorbid elderly patients with T2DM, as these factors are essential for ensuring a relatively favorable cardiovascular prognosis [25, 26].

Advances in modern hypoglycemic therapy, including the use of contemporary insulin formulations and oral glucose-lowering agents such as sodium-glucose co-transporter-2 inhibitors (SGLT-2 inhibitors) and dipeptidyl peptidase-4 inhibitors (DPP-4 inhibitors), combined with patient education programs in diabetes schools, have substantially reduced the incidence of acute diabetic complications. The average life expectancy of patients with diabetes mellitus has significantly increased, resulting in an aging patient population and a consequent rise in the relative proportion of cardiovascular events among diabetic complications [6]. The clinical and metabolic characteristics of patients with T2DM identified in this study clearly demonstrate the pivotal role of hypertension, dyslipidemia, and obesity in shaping disease prognosis among the elderly. These conditions, driven by the progressive nature of insulin resistance, determine cardiovascular risk and, in most cases, significantly influence patient life expectancy. The proportion of elderly patients with T2DM receiving insulin therapy and sulfonylureas remains high, accounting for 46.7% and 39.7%, respectively, according to data from the local ARME registry. Undoubtedly, these agents exert potent hypoglycemic effects and have demonstrated clinical efficacy; however, they are associated with side effects particularly relevant to elderly patients, including promotion of insulin resistance and weight gain. Adherence to patient-centered care principles necessitates that clinicians prescribe these medications with heightened caution in elderly populations. The coexistence of two potent cardiovascular risk factors – advanced age (≥ 60 years) and T2DM – in elderly patients compels clinicians to carefully and rationally balance the risks and potential benefits of prescribed therapeutic agents. It is essential to consider that excessive intensification of diabetes treatment in elderly patients – particularly the unwarranted use of short-acting insulins and

glucose-independent secretagogues – may exacerbate insulin resistance and impair cardiovascular function without conferring significant benefits in mitigating long-term cardiovascular risks.

In clinical scenarios typical of comorbid elderly patients with T2DM, preference should be given to hypoglycemic agents of the sodium-glucose co-transporter-2 inhibitor (SGLT-2i) class. Given that the development of chronic heart failure (CHF) is an almost inevitable outcome in elderly patients with advanced diabetes mellitus, the timely initiation of gliflozins – which exert a pathogenetic effect on CHF progression and constitute a recognized component of quadritherapy – is critically important for improving prognosis.

Conclusion

The majority of elderly patients with T2DM exhibited a high prevalence of macrovascular complications, including coronary heart disease (CHD) at 42.4%, stroke at 11.4%, and CODILLA at 10.1%. These complications were closely associated with frequent atherogenic comorbidities such as hypertension (87.8%), obesity (60.2%), and dyslipidemia (82.4%), attributable to pronounced manifestations of insulin resistance and metabolic syndrome.

Elderly patients with T2DM assessed during routine outpatient visits often failed to achieve target therapeutic control indicators for key parameters: HbA1c (56.7%), glycemia (60.9%), and systolic blood pressure (79.8%).

In prescribing pharmacotherapy for elderly patients with T2DM, the severity of concomitant metabolic syndrome is not consistently considered. A notably high proportion of patients received insulin therapy (46.7%) and agents stimulating glucose-independent insulin secretion (39.7%).

The identified clinical and metabolic characteristics of elderly outpatients with T2DM highlight the need to improve monitoring practices, advocating for a multidisciplinary team approach that includes mandatory involvement of a cardiologist.

Ethical approval

The study protocol was approved by the Bioethics Committee of Samara State Medical University (Protocol No. 199, dated April 3, 2019).

Conflict of Interest

The author declares no conflicts of interest.

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