REPUBLIC OF AZERBAIJAN

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ABSTRACT

Of the dissertation for the degree of Doctor of Science

CLINICAL - EPIDEMIOLOGICAL FEATURES OF MICRO- AND MACROANGIOPATHIES IN DIABETES TYPE 2 PATIENTS IN AZERBAIJAN

Speciality: 3205.01 - Internal diseases

Field of science: Medicine

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GENERAL CHARACTERISTICS OF THE RESEARCH WORK

Relevance and development rate of the topic. Diabetes mellitus (DM) is one of the most important medical and socio-economic diseases. Despite various preventive and curative measures in the fight against this disease, the disease continues to grow rapidly. According to the International Diabetes Federation (IDF), 537 million people with DM were registered in the world in 2021 among the population aged 20-79, 643 million in 2030 and 783 million in 2045, and the overall growth rate of the disease is 46% is projected. The lowest rates of disease growth on the continents are shown in Europe (13%) and the highest in Africa (134%)[1]. With this move, diabetes is expected to be the 7th leading cause of death in the world by 2030[2].

According to the İDF in 2021, the number of diabetics in Azerbaijan aged 20-79 was 397.100, the prevalence was 5.6%, and the number of undiagnosed diabetics was 157.200. 7577 deaths registered in the country during the year fell to the share of diabetic patients aged 20-79, the annual cost of the state for each diabetic patient was $ 482.4[1].

Among patients with diabetes, the share of type 2 diabetes mellitus (DM2) is 90-95%, and among the complications of this disease by the target organs (heart, brain, eyes, kidneys, peripheral arteries and nerves), cardiovascular disease (CVD) is dominated[1,3].

The mechanism of cardiovascular events during DM2 is complex. Insulin resistance, which is mainly noted in patients, is accompanied by compensatory insulinemia. Oxidative stress accelerates the accumulation of free radicals. Dysfunction of the vascular endothelium, vascular inflammation is formed. Fat spots lead to the formation of atherosclerotic nodules after a long time,

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[1] İDF Diabetes Atlas, 2021.

[2] WHO. Global report on diabetes, 2016.

[3] Standards of Medical Care in Diabetes - 2022. Abridged for Primary Care Providers // Clinical Diabetes , - 2022. 40 (1). - p. 10-38.

platelet hyperactivity occurs, the likelihood of thrombus formation increases. Under the influence of cytokines and fatty acids, vascular remodeling occurs, intima-media thickness increases and atherosclerotic plaque is formed[4,5].

Every year, 17 million people worldwide die from CVD, of which 5 million are diagnosed with DM. Diabetes mellitus is 2-3 times more common in non-diabetic patients and lower limb amputation is 10-20 times more common in non-diabetic patients, and 43% of deaths in diabetic individuals are premature (under 70 years of age)[2]. It was found that the prevalence of coronary heart disease (CHD) in patients with diabetes is 21%, myocardial infarction (MI) is 10%, and the incidence of stroke is 7.6%. DM increases the risk of coronary heart disease by 160%, the risk of hemorrhagic stroke by 56%, and the risk of death by CVD by 132%[6]. According to another report, 17.1 per 1,000 people with DM2 had cardiovascular deaths[7]. It has been proven that by adequately combating the main risk factors (smoking, excessive alcohol intake, hypertension, hyperlipidemia, overweight, physical inactivity, etc.) in patients with diabetes, it is possible to reduce the risk of sudden death by 80%. Health spending on primary and secondary diabetes prevention is growing every year, as global spending on diabetes in 2019 totaled $ 760 million[2].

It is known that DM2 patients living in each geographical and climatic region have their own risk factors for micro- and

[4] Lars, R. ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD / R. Lars, J.G. Peter, D.A. Stefan [et al.] // European Heart Journal, - 2013. - 34. - p. 3035-3087.

[5] Yuanying, S. Prevalence, treatment, control of type 2 diabetes and the risk factors among elderly people in Shenzhen: results from the urban Chinese population / S. Yuanying, N. Wenqing, Y. Xueli [et al.] // BMC Public Health. - 2020. - 20(1). - p. 998.

[6] İDF Diabetes Atlas, 2019.

[7] Sattar, N. Age at diagnosis of type 2 diabetes mellitus and associations with cardiovascular and mortality risks / N. Sattar, R. Araz, F. Stefan [et al.] // Circulation, - 2019. - 139(19). - p. 2228-2237.

macrovascular complications. Studies have shown that subclinical risk factors for various organ injuries in patients with diabetes (left ventricular hypertrophy (LVH), ankle-brachial index (ABI), atherosclerotic plaque in the carotid arteries, albuminuria, cardiac autonomic neuropathy, etc.) are also serious predictors of CVD in general[8,9,10]. Scales based on UKPDS (British prospectus study), NDR (Swedish National Register), Fremingham study on stroke, ADVANCE study for the assessment of cardiovascular risk in patients with diabetes have been successfully used in the prevention of CVD and are prognostically useful[4]. Regular screening and assessment of subclinical and clinical risk factors in patients with diabetes is very important, and timely prevention of life-threatening complications of diabetes, early and sustained loss of ability to work due to the disease, mortality by taking adequate measures to combat the identified risk factors and it is possible to significantly reduce health care costs in this direction.

In order to investigate and solve this problem, the next "Strategy for combating non-communicable diseases in the Republic of Azerbaijan in 2015-2020" and the Cabinet of Ministers of the Republic of Azerbaijan dated January 28, 2016 by the Decree of the President of the Republic of Azerbaijan No. 1645 dated December 23, 2014 By Resolution No. 15, the "State Program on Diabetes for 2016-2020" was adopted, and the work on the implementation of these programs has been successfully completed.

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[8] Gaede, P. Years of life gained by multifactorial intervention in patients with type 2 diabetes mellitus and microalbuminuria: 21 years follow-up on the Steno-2 randomised trial / P. Gaede, J. Oellgaard, B. Carstensen [et al.] // Diabetologia, – 2016. - 59. - p. 2298-2307.

[9] Yingyi, Z. Risk factors for albuminuria in normotensive older adults with type 2 diabetes mellitus and normal renal function: A Cross-Sectional Study / Z. Yingyi, C. Ke, D. Xuan [et al.] // Diabetes Ther. - 2021. - 12(3). - p. 697-705.

[10] Hanssen, N.M. Associations between the ankle-brachial index and cardio-vascular and all-cause mortality are similar in individuals without and with type 2 diabetes: nineteen-year follow-up of a population-based cohort study / H.M. Hanssen, M.S. Huijberts, C.G. Schalkwijk [et al.] // Diabetes Care, - 2012. 35. - p. 731–735.

Given the urgency of the problem, the European Society of Cardiology, in collaboration with the European Association for the Study of Diabetes, developed a guide in 2013 and 2019 entitled "Recommendations for Diabetes, Prediabetes and Cardiovascular Disease", which assesses cardiovascular risk in patients with diabetes the latest information on the principles of evidence-based medicine for possible complications in different vascular basins is reflected[4,11].

Antidiabetic drugs used in the treatment of DM differ in the mechanisms of action in the prevention of CVD. In recent years, the US Food and Drug Administration (FDA) has demanded that pharmaceutical companies develop new antihyperglycemic drugs that reduce the risk of cardiovascular complications as well as their diabetic effects. In the treatment of diabetes, preference should be given to antihyperglycemic drugs that are safe and at the same time reduce micro- and macrovascular complications. Therefore, sodium-glucose co-transporter 2 inhibitors (empagliflozin, dapagliflozin, kanagliflozin, ertugliflozin, sotagliflozin) from antidiabetic drugs produced in recent years, it has been studied in detail in "EMPA-REG OUTCOME", "VERTIS-CV", "CANVAS", "CREDENCE", "DECLARE-TIMI 58", "SCORED", "DAPA-HF" researches. This group of drugs has been shown to be recommended for the prevention of hospitalization for heart failure, major cardiovascular events, terminal renal failure, and cardiovascular death in patients at risk of CVD (I).

In patients with CVD, including heart failure, metformin is considered safer than insulin and sulfonylurea (SU), but metformin has a glomerular filtration rate (GFR) <30 ml / min due to the risk of lactoacidosis and is not recommended for use in diabetic patients with hepatic failure. The efficacy of metformin in the prevention of cardiovascular events has not been studied in large-scale randomized studies.

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[11] Francesco, C. ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD / C. Francesco, J.G. Peter, A. Victor [et al.] // European Heart Journal, - 2019. - 00. - p. 1-69.

Hospitalization of heart failure increased by 27% against treatment with saxagliptin, a dipeptidyl peptidase - 4 inhibitor. Vildagliptin increased the volume of the left ventricle and increased mortality and cardiovascular events. Overall, the effects of DPP 4 inhibitors on cardiovascular events and mortality were neutral.

Glucagon-like peptide -1 agonists (liraglutide, semaglutide, dulaglutide) to reduce the risk of cardiovascular events (IA) in patients with DM2 and CVD or very high / high cardiovascular risk, and liraglutide to reduce the risk of death in these patients recommended (IB).

Insulin preparations may pose a risk of Na and water retention in patients with chronic heart failure (CHF). Therefore, if insulin is used in patients with heart failure, the course of the disease should be monitored after the start of treatment.

The use of SU drugs has been associated with a higher risk of heart failure. Therefore, SU drugs should not be preferred in patients with diabetes mellitus, and the worsening of heart failure should be monitored during their use.

Thiazolidondions (glitazones) worsen heart failure because they retain water and salt in the body and therefore increase the risk of hospitalization. The use of this group of drugs in heart failure is contraindicated[12]. Therefore, antidiabetic drugs prescribed to patients with DM2 should provide adequate glycemic control, as well as high cardiovascular safety.

The research work was also carried out on the basis of the agreement No. 20-D-2011 covering the years 2011-2019 on scientific cooperation between the Azerbaijan State Advanced Training Institute for Doctors named after A. Aliyev and the National Medical Research Center for Therapy and Preventive Medicine of the Russian Federation.

Thus, in order to adequately treat patients with DM2, it is necessary to timely detect the clinical and subclinical manifestations

[12] Theresa, A.M. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure / A.M. Theresa, M. Marco, A. Marianna [et al.] // European Heart Journal, - 2021. - 00. - p. 1-128. doi:10.1093/eurheartj/ehab368.

of micro- and macrovascular complications, study and evaluate the real clinical-epidemiological situation in this field, and seriously fight against the risk factors of target organ damage. This work is considered one of the important issues that are regularly studied in the countries of the world, and the scientific-research work conducted by us is aimed at the study of this problem and the solution of State Programs.

Object and subject of research work. In the study, 528 DM2 patients were studied, and the clinical and epidemiological status of target organ damage in these patients was studied as the subject of the study.

The purpose of the research work is to study the clinical-epidemiological features of the distribution of manifestations of micro- and macrovascular complications in DM2 patients living in Azerbaijan and their interaction with the risk factors of CVD.

The main tasks of the research work:

1. To study the summary clinical and epidemiological features of risk factors and target organ damage in DM2 patients.
2. To study the sex and age-specific characteristics of micro- and macrovascular complications and risk factors in this group of patients.
3. Study of regional features of subclinical and clinical atherosclerosis in patients with diabetes.
4. To study the association between different antidiabetic treatment tactics and risk factors and CVD.
5. To study the relationship between the level of glycemic control and micro- and macrovascular complications and their risk factors.
6. To study the prevalence of hypertension in the DM2 Azerbaijan cohort and the clinical and epidemiological features of its main risk factors.
7. Assignment of predators of erectile dysfunction (ED) in patients with diabetes
8. To study the association between patients' levels of education and key risk factors.

9. To study the prevalence of chronic kidney disease (CKD) in patients with DM2, the association between it and risk factors and CVD.

The main provisions submitted to the defence:

- DM2 Azerbaijan cohort has risk factors, subclinical and clinical organ damage with its own gender and regional characteristics.
- Against the background of various antidiabetic treatment tactics, glycemic control was not optimal, and the prevalence of CVD and its risk factors was high.
- The age of patients, the duration of diabetes, body mass index (BMI), increased BP, the use of harmful habits and inadequate glycemic control had a significant impact on the formation of ED in diabetic patients.
- Patients' education did not play a significant role in glycemic control, CVD, and risk factor prevention.
- There are general and specific risk factors for microalbuminuria (MAU) and reducing GFR in DM2 patients.
- In the prevention of target organ damage in the DM2 cohort, it is important to ensure adequate control of glycemia, especially the timely detection of markers of subclinical atherosclerosis, the implementation of measures to combat risk factors.
- Adequate management of DM2 and prevention of CVD is very important to improve the knowledge and skills of specialists of different specialties and their teamwork.

Scientific innovation of the research work:

- Subclinical and clinical lesions occurring in target organs in DM2 patients were studied.
- The interaction and predicates of micro- and macroangiopathy with risk factors in this group of patients were studied.
- The glycemic status and antidiabetic treatment regimens of the changes detected in the DM2 cohort were investigated.

– Age, gender and regional characteristics of the clinical and epidemiological situation in DM2 patients were studied in a comprehensive manner.

Theoretical and practical significance of the study:

A strategy for a differentiated approach to patients has been developed, taking into account the age, gender and region characteristics of target organ damage in DM2 patients.

The main risk factors for micro- and macroangiopathy in patients have been studied separately and comprehensively, which will help medical specialists to choose more appropriate treatment tactics.

Specialists were provided with detailed information on the clinical and epidemiological features of various treatment tactics (antihyperglycemic, antihypertensive, antianginal, hypolipidemic, antiplatelet) received by patients with diabetes in inpatient and outpatient settings.

The obtained results provided a basis for the development and implementation of a comprehensive action plan and National Strategy for the prevention of 1st and 2nd target organ damage in DM2 patients.

Approbation of the research work and application of research results. The main provisions of the dissertation were discussed at international forums of cardiologists and therapists (Moscow, 2012, 2013, 2014, 2015, 2017, 2018, 2019, 2020, 2021,2022), at the scientific-practical conference dedicated to A.M. Aliyev's birthday (2014), with a cardiologist and therapist at interregional scientific-educational conferences (Saratov, 2015; Saransk, 2017), II interregional conference of cardiologists and therapists (of Ulyanovsk, 2016), conference dedicated to the International Day of Diabetes (Baku, 2016), scientific-educational conferences of Caucasian cardiologists and therapists (Grozny, 2016; Makhachkala, 2017, Stavropol, 2018), at the National Congresses Russian Cardiologists (Kazan, 2020; St. Petersburg, 2021), "The 11th World Congress on Controversies in Neurology" (Athens, 2017), "The Great Wall International Congress of Cardiology" (Beijing,

2018,2019,2020,2021), "18th Annual World Congress on Insulin Resistance Diabetes and Cardiovascular Disease" (USA, 2020).

The preliminary discussion of the dissertation work was held on 25.06.2021 by the meeting held with the participation of employees of the therapy, cardiology, family medicine and central scientific research laboratory at the Azerbaijan State Advanced Training Institute for Doctors named after A. Aliyev (protocol No. 7), and the discussion of the scientific seminar was held at the meeting of the ED 2.27 Dissertation Council at the Azerbaijan Medical University on 07.06.2022 (protocol No. 8).

The materials of the dissertation were submitted to the Ministry of Health of the Republic of Azerbaijan in the form of annual reports within the State Programs for Combating Non-Communicable Diseases and DM, and to the Azerbaijan National Academy of Sciences in accordance with the research plan of the Azerbaijan State Advanced Training Institute for Doctors named after A. Aliyev. The results of the research were applied in the education process of the departments of therapy, cardiology, family medicine and nephrology of the institute, in the diagnostics and treatment of cardiology, endocrinology, nephrology, neurology, ophthalmology, surgery departments of the Republican Clinical Hospital named after academician M. Mirgasimov, the Republican Endocrinology Center and Baku polyclinic N3.

The institution where the dissertation was prepared: Azerbaijan State Advanced Training Institute for Doctors named after A. Aliyev.

Published works. 63 scientific works, including 32 articles (10 local, 22 foreign), 30 theses (3 local, 27 in foreign publications) and 1 textbook were published on the subject of the dissertation.

Volume and structure of the dissertation. The dissertation consists of an introduction (13044 - signs), 5 chapters, a conclusion (5601 - signs), practical recommendations (1916 - signs) and a list of references. Chapter I - a review of the literature (46214 - a sign), chapter II - the materials and methods of research (8254 - a sign), chapter III - to the findings from the study (89332 - a sign), chapter

IV - to the discussion of the results of scientific research (130738 - a sign), chapter V - to the conclusion of the study (24522 - a sign) dedicated. The total volume of the dissertation by sign (excluding bibliography, pictures and tables) - 342530 signs. The dissertation is typed on 291 A4 pages, illustrated with 68 tables and 21 figures. The bibliography includes 425 sources (8 of them in Azerbaijani, 23 in Russian, 394 in English).

MATERIALS AND METHODS OF RESEARCH WORK

General characteristics of the clinical part

800 people were screened and data from 528 patients were used for analysis aged 30-69 diagnosed with DM2 and registered in the endocrinology departments of the Republican Clinical Hospital named after academician Mirgasimov, the endocrinology office of the hospital polyclinic and the Republican Endocrinology Center. Patients with type 1 diabetes, <30-> 69 years, hematological, oncological, diffuse connective tissue diseases, suffering from mental illness, during pregnancy and lactation, and other participants in the study were not included in the study. The scientific research work covered the years 2012-2018.

161 (30.5%) patients were male and 367 (69.5%) were female, with an average age of 53.9±0.4 years. Their age composition was as follows: 30-39 years - 1.9 ± 0.6%; 40-49 years - 25.0±1.9%; 50-59 years - 49.8±2.2% and 60-69 years - 23.3 ± 1.8%.

Research methods. DM2 patients answered questions through the "ARIC" international questionnaire, prepared by experts from the World Health Organization and widely used in clinical and epidemiological research. The questionnaire contained information on anthropometric, socio-demographic and behavioral risk factors.

According to the survey, if the patient consumes 7 bottles (3.5 liters) and more beer and/or 700 grams 5 times a week and more often and if he has taken more dark wine and/or 1 liter and more wine and/or 300 grams and more of vodka and other dark drinks, he

is in excess of alcohol, and if the amount of alcohol consumed is less than these values, he shall abstain from alcohol rated as using low and medium amounts.

BMI (Ketle index) was calculated with an accuracy of 0.1 kg/m² and is <25 kg/m² - normal, 25-29 kg/m² - overweight (pre-obesity), 30-34 kg/m² - I degree, 35-39 kg/m² - II degree, ≥40 kg/m² - III degree obesity. According to the report of experts of the US National Education Program (NCEP ATP III), waist circumference in men ≥102 cm, women ≥88 cm, according to the classification of the IDF, waist circumference of ≥94 cm in men and ≥80 cm in women is considered as abdominal obesity.

People who sat for less than 5 hours a day and walked for at least 30 minutes a day and / or exercised for at least 2 hours a week were considered normal, and those who were less active were considered less physically active.

According to the survey, patients with one of the types of disorders of carbohydrate, fat and salt metabolism - mild (1-1.9 points), 2 types of eating disorders - moderate (2-2.9 points), and the presence of all 3 is severe (≥ 3 points) malnutrition, and 0-0.9 points were taken as an indicator of healthy nutrition (see: excerpt from the "ARIC" questionnaire).

Nutrition

Salt

1. Do you add salt to the prepared food: no | __ | yes | __ |
2. Consumption of salted foods (for example, canned vegetables):
do not use 1-2 times a month 1-2 times a week every day

Oils

3. Sausage products: 1-2 times a month 1-2 times a week every day
4. Butter during the day: do not use 1-2 tsp. 3-4 tsp. more than 4 tsp
5. How many eggs do you eat during the week? pieces

Carbohydrates

6. Flour and confectionery: 1-2 times a month 1-2 times a week every day
7. Sugar during the day: 1-3 teaspoons 4-6 tsp. more
8. Consumption of fruits and vegetables: several times a day once a day 2-3 times a week rarely

Patients answered questions on the hospital scale for anxiety and depression. Based on the answers received, 0-7 points - normal, 8-10 points - subclinical anxiety and depression, ≥11 points - as clinically significant anxiety and depression, 1-1.9 points - severe, 2-2.9 points - moderate , 3-3.9 points - mild stress, and 0-0.9 points - no stress (see: excerpt from the questionnaire).

Hospital scale of anxiety and depression

A I feel tension, i'm not in myself
□ 3 points always
□ 2 points often
□ 1 point periodically, sometimes
□ 0 points I never feel

D It makes me feel the same way it used to
□ 0 points is almost like that
□ 1 point is probably so
□ 2 points is only slightly so
□ 3 points not so

A I feel scared, I think something terrible is going to happen
□ 3 points is almost like that and the fear is very strong
□ 2 points yes, but the fear is not very strong
□ 1 point sometimes, but it doesn't

D I think I do everything slowly
□ 3 points almost always
□ 2 points often
□ 1 point sometimes
□ 0 points is not the case

A I feel internal tension or tremor
□ 0 points I don't feel at all
□ 1 point sometimes
□ 2 points often
□ 3 points too often

D I don't pay attention to my appearance
□ 3 points is almost like that
□ 2 points I don't spend enough time on it
□ 1 point There may be that I pay less attention to

bother me
□ 0 points I don't feel at all

D I can laugh and I can see something funny at any event
□ 0 points is almost like that
□ 1 point is probably so
□ 2 points is only slightly so
□ 3 points I can't

A Anxious thoughts run through my head
□ 3 points always
□ 2 points most of the time
□ 1 point sometimes, not often
□ 0 points rarely

D I feel refreshed
□ 3 points I never feel
□ 2 points I rarely feel
□ 1 point sometimes feel
□ 0 points I almost always feel

A I can easily relieve tension
□ 0 points is almost like that
□ 1 point is probably so
□ 2 points rarely
□ 3 points I can't do it at all

□ 0 points I consider myself as before

A I can't sit still, I think I always have to move
□ 3 points is almost like that
□ 2 points is probably so
□ 1 point is only in some cases
□ 0 points is not the case

D I think that my work (lesson, occupation) can bring me satisfaction
□ 0 points are the same as usual
□ 1 point yes, but not as before
□ 2 points is quite low compared to ordinary work
□ 3 points I do not think so at all

A I suddenly feel anxious
□ 3 points too often
□ 2 points often enough
□ 1 point is not often
□ 0 points are not available at all

D I can enjoy reading a good book or watching a radio or TV show
□ 0 points often
□ 1 point sometimes
□ 2 points rarely
□ 3 points very rarely

Stress

Criteria	Yes, I agree	Most likely I agree	Most likely I do not	No, I do

			agree	not agree
Probably I'm a nervous person	1 point	2 points	3 points	4 points
I am very worried about my work	1 point	2 points	3 points	4 points
I often have nervous tension	1 point	2 points	3 points	4 points
My daily work creates great stress	1 point	2 points	3 points	4 points
When communicating with people, I often get nervous i hold	1 point	2 points	3 points	4 points
Towards the end of the day I am very tired physically and mentally	1 point	2 points	3 points	4 points
Tensions often arise in my family	1 point	2 points	3 points	4 points

Quality of life indicators were assessed according to the EQ-5D survey (European Quality of Life Instrument) and assessed the diabetic patients' movements, self-care, daily activity, pain, discomfort, anxiety, and depression (see: excerpt from the questionnaire).

EQ-5D survey (European Quality of Life Instrument)

I. Action

1. I have no problem with movement
2. I have some problems with movement
3. I am bedridden

II. Self-care

1. I do not have a problem with self-care

2. I have some problems while washing and dressing
3. I can't wash and wear myself

III. Daily activity

1. No problems with daily chores (work, education, housework, family responsibilities, leisure, etc.)
2. I have some problems with daily work
3. I can't do daily chores

IV. Pain, discomfort

1. I do not feel pain or discomfort
2. I feel some pain or discomfort right now
3. I have pain or discomfort

V. Anxiety, depression

1. I do not feel anxiety, depression
2. I have some anxiety or depression right now
3. I have severe anxiety or depression

Your health status in the last 1 year compared to previous years:

- It has improved
- Not changed
- It's worse

Blood pressure (BP) was measured with a mercury manometer, with a 5-minute break in the sitting position of the patients, twice, 2 mm Hg. measured accurately, the average of 2 measurements was taken for analysis. In assessing the severity of hypertension, reference was made to the 2018 International Classification of European Cardiologists and the European Society of Hypertension.

Sokolov-Layon (SV1 + RV5>3.5 mB, RaVL>1.1 mB) and Cornell voltage indices (>244 mBxmsec.) electrocardiographic (ECG) sign of LVH, left ventricular mass index in men >115 g/m² and >95 g/m² in women were taken as echocardiographic (EchoCG) criteria for LVH.

Based on the survey and objective examination, the CHD, MI, CHF and the treatment tactics they received in connection with these diseases, ECG and EchoCG criteria of these pathologies were clarified. ECG at rest taken on a "Cardioline" (Italy) device, presence of pathological Q-wave or QS, ST segment elevation and negative T-wave (with confirmation of cardio-specific enzymes) ECG signs of MI, negative T-wave and horizontal or ST-segment depression was considered to be an ECG indicator.

During the holter monitoring of the ECG during the day, various types of arrhythmias, changes in the T-wave and ST-segment were detected in the "Toshiba" (Japan).

In patients with asymptomatic diabetes, increased left ventricular mass, diastolic and systolic dysfunctions are associated with poor prognosis. During transthoracic sonographic examination of the heart, left ventricular relaxation with normal filling pressure, pseudonormal appearance, reversible and irreversible restrictive diastolic dysfunction with high filling pressure, severe decrease in left ventricular ejection fraction and increase in end-diastolic volume are exacerbated systolic dysfunction.

Information about brain stroke was obtained based on the survey.

Color duplex scanning of the lower peripheral arteries and carotid arteries was performed using the "SONO 8X PRIME" device made in South Korea. This examination provided information on the forms of blood flow in the lower peripheral arteries and the degree of stenosis in individual segments. The ABI is an objective method of detecting chronic ischemia of the lower extremities. This index is taken as the ratio of systolic BP at the level of the posterior artery of the leg and the posterior great cane artery to the same value in the basal artery. ABI $\leq$0.9 indicated peripheral artery disease, 0.7-0.9-mild, 0.4-0.7-moderate, and <0.4-severe stenosis.

Intimate-media thickness (IMT)>0.9-<1.3 mm was assessed as a sign of stenosis in the carotid arteries, and IMT$\geq$1.3 mm was assessed as atherosclerotic plaque.

Plasma glucose ≥7 mmol/l taken from the elbow vein after 9-12 hours of fasting was considered hyperglycemia. Glycohemoglobin (HbA1c) was measured expressively by "CLOVER A1" (South Korea) and ≥7% was assessed as inadequate glycemic control.

Levels of total cholesterol, high-density lipoprotein cholesterol (HDL-C), triglycerides (TG), high-sensitivity C-reactive protein (hs-CRP), creatinine, uric acid in fasting blood plasma were determined photometrically by "STAR FAX" (USA). The non-HDL-C is defined by the following formula: total cholesterol – HDL-C. Total cholesterol <5 mmol/l, HDL-C in men >1.0, women >1.2 mmol/l, non-HDL-C <3.36 mmol/l, TG <1.7 mmol/l, hs-CRP ≤5 mg/l, creatinine 53-115 μmol/l in men, 44-90 μmol/l in women, uric acid in men - 200-420, women - 140-340 μmol/l were accepted as the norm.

GFR was determined by the CKD-EPI (Chronic Kidney Disease Epidemiology Collaboration) method, which is an indicator of the functional status of the kidneys, and this criterion is ≥90 ml/min/1.73 m² is the norm or the 1st stage of CKD (when there are signs of kidney damage), 60-89 ml/min/1.73 m² - 2nd, 30-59 ml/min/1,73m² - 3rd, 15-29 ml/min/1,73m² - 4th, <15 ml/min/1.73 m² was assessed as stage 5 or terminal renal failure. The level of MAU was determined by micro-tests in the urine collected during the day (Hungary) and was considered 30-300 mg/dl as pathology.

The ED assessment scale was based on the International Erectile Dysfunction Index, and the degree of ED was determined based on the scores obtained from patients' responses to the questionnaire. 22-25 points showed normal erectile function, 17-21 points - mild, 12-16 points - moderate-mild, 8-11 points - moderate, and 5-7 points - severe ED (see: from the survey fragment).

ERECTILICAL FUNCTION ASSESSMENT SCALE
(International Index of Erectile Function)

1. How do you get an erection during sexual intercourse?
- almost never or never - 1 point

- several times (less than half of this time) - 2 points
- sometimes (about half) - 3 points
- in many cases (more than half) - 4 points
- almost always or always - 5 points

2. When does an erection occur during sexual desire, is it enough to insert the penis into the uterus?

- almost never or never - 1 point
- several times (less than half of this time) - 2 points
- sometimes (about half) - 3 points
- in many cases (more than half) - 4 points
- almost always or always - 5 points

3. Can you maintain an erection after inserting a penis into the uterus during sexual intercourse?

- almost never or never - 1 point
- several times (less than half of this time) - 2 points
- sometimes (about half) - 3 points
- in many cases (more than half) - 4 points
- almost always or always - 5 points

4. How difficult is it for you to maintain an erection until the end of sexual intercourse?

- Extremely difficult - 1 point
- very difficult - 2 points
- difficult - 3 points
- a bit difficult - 4 points
- Not difficult - 5 points

5. How satisfied are you with sex?

- almost never or never - 1 point
- several times (less than half of this time) - 2 points
- sometimes (about half) - 3 points
- in many cases (more than half) - 4 points
- almost always - 5 points

All patients were examined by a neurologist and neurological complications of the disease were identified. In addition to the anamnesis and subjective complaints of patients, the following

methods were used to detect diabetic polyneuropathy: tactile sensation 10 gr. (5.07 Semmes-Weinstein) monofilament, pain sensing threshold neurological pen (Neuropen) or gear (pin-wheel), temperature sensing special device - thermal tip (Thip-term), and the vibration sensing limit vibrates at a frequency of 128 hertz assessed using a neurological tuning fork or bioteziometer.

Diabetic retinopathy was diagnosed by an ophthalmologist based on a survey, changes in visual acuity, and ophthalmoscopy.

Statistical processing of the achieved results. Statistical analysis of the obtained data was performed in MS EXCEL-2010 and SPSS-20 programs using the methods of analysis of variation (t-Student, Kruskal-Wallis), discriminant (χ^2-Pearson's tetrachoric and polyhoric criteria) and variance (ANOVA test). The data are presented in the form of an average ± standard error (in qualitative data - frequency) and its 95% confidence interval (CI). When $p < 0.05$, the results were considered statistically significant.

RESULTS OF THE RESEARCH

The results of a study conducted in the DM2 Azerbaijan cohort, it was found that in this group of patients in general, obesity (66.8±5.1%), malnutrition (74.8±1.9%) and psychosocial status disorders (anxiety - 77.3±1.8%; depression - 67.0±2.0%; stress - 99.8±0.2%), low employment rate (65.7±2.1%), excessive alcohol consumption (12.7±1, 4%), low physical activity (53.6±2.2%) and other risk factors predominated (Table 1). At the same time, the incidence of DM (52.8±2.2%) in close relatives of patients with diabetes, and obesity (71.8± 1.9%) and hypertension (29.6±1.9%) in the parents of patients has been high. The complex effect of these risk factors has led to a significant deterioration in the quality of life of patients.

Based on the survey, 11.4±1.4% of patients showed clinical signs of CHD (according to the ROSE survey - 21.0±1.8%), of which only 33.3±6.1% received antianginal treatment. History of MI was found in 7.25±1.1%, various types of arrhythmias in 11.6±1.4%,

clinical signs of CHF in 26.7±1.9% of patients, of which 15.4% of them ECG signs of MI, in 11.2% ECG signs of CHD, in 47% of left ventricular diastolic, and in 2.3% of left ventricular systolic dysfunction were detected. During holter monitoring of ECG during the day, 64.7±1.4% of patients had various arrhythmias. As can be seen, the adherence to antianginal therapy in patients with DM2 and CHD was low, ECG signs of MI were detected twice as much as in the survey,

Table 1

Frequency of spread of social-behavioral risk factors (%)

Socio-behavioral risk factors	Gradation	n	%
Level of education	Higher	165	31.3±2.0
	Professional	112	21.2±1.8
	Average	211	40.0±2.1
	Incomplete average	36	6.8±1.1
	No	4	0.8±0.4
Employment status	Works	181	34.3±2.1
	Does not work	347	65.7±2.1
Marital status	Single	14	2.7±0.7
	Married	420	79.5±1.8
	Divorced	14	2.7±0.7
	Widow	80	15.2±1.6
Smoking	Smokes	66	12.5±1.4
	Do not smoke	462	87.5±1.4
Alcohol	Does not use	129	24.4±1.9
	In small and medium quantities	332	62.9±2.1
	In large quantities (excess)	67	12.7±1.4
Low physical activity	No	245	46.4±2.2
	There are	283	53.6±2.2

and the incidence of diastolic heart failure was higher than in systolic heart failure.

Despite the detection of clinical signs of cerebrovascular atherosclerosis in 46.6% of the respondents, 78.9% of patients had carotid artery sonography and had an IMT>0.9 mm (mean 1,217± 0.038 mm). Less han 40% of carotid artery stenosis in 30.6±5.4% of those examined, 50-59% in 58.3±5.8%, 60-95 in 12.5±3.9% %, 4% of patients had a history of stroke, and 31.6% had clinical signs of vertebro-basilar insufficiency. Clinical signs of atherosclerosis of the lower extremities were noted in 66.7% and ABI<0.9 in 27.2±1.4% of patients. Sonography revealed stenosis of the lower peripheral arteries in all diabetic patients, the severity of which ranged from 20 to 90%, and the mean and severity of stenosis increased significantly in the periphery. Circulation in the lower peripheral arteries was mainly in the trunk type and subcompensation phase, and an inverse correlation was noted between the severity of peripheral stenosis and its incidence. Therefore, in order to prevent damage to peripheral arteries in diabetic patients, it is necessary to conduct regular screening of subclinical and clinical symptoms of the disease, accurately assess the data found and make timely correction of complications.

Hypercholesterolemia was found in 78.9% of patients with DM2, HDL-C below normal in 85.1%, hypertriglyceridemia in 19.1%, and pathological indicators of hs-CRP in 60.6% of patients. Although 94.3±0.7% of patients received mono- and combined antihyperglycemic therapy, 82.0% had glycemia ≥7 mmol/l, 81.0% had HbA1c≥7%, hypercreatininemia was observed in 17.1% and hyperuricemia in 5.3%. GFR was within the norm in 43.6±2.3% of patients or 1st stage of CKD, in 48.5 ± 2.3% of patients in 2nd, 7.5 ± 1.2% of CKD - 3, stages 4 and 5 were detected, with 0.2±0.2% of patients in each. 30 mg/dl MAU in 28.8 ± 2.0% of patients, in 5.4 ± 1.0% - 100 mg/dl, and in 3.2±0.8% - 300 mg/dl MAU was determined. The results showed that in addition to adequate treatment of hyperglycemia for the successful management of DM2 patients and

timely prevention of cardiovascular complications, it is important to work as a team of cardiologists, nephrologists, therapists, neurologists, ophthalmologists and vascular surgeons, multifactorial approach to patients.

Important data were obtained during the study of the sex-dependent characteristics of the diabetic patients participating in the study. Thus, among male patients with DM2, smokers (39.1% vs 0.8%, $p<0.001$), those who consumed excessive alcohol (39.1% vs 1.1%, $p<0.001$), mild malnutrition (43.5% vs 36.8%, $p<0.01$), overweight (40.4% vs 21.0%, $p<0.001$), low physical activity (60.2% vs 50.7%, $p<0.05$), sinus tachycardia (58.4% vs. 19.6%, $p<0.001$), history of MI (11.8% vs 5.2%, $p<0.01$), left ventricular ejection fraction <50% (17.4% vs 9.0%, $p<0.01$), left ventricular systolic dysfunction (5.4% vs 1.0%, $p<0.05$) and myocardial akinesia (5.4% vs 0.7%, $p<0.01$) predominated. In women, low alcohol intake (68.1% vs 50.9%, $p<0.001$), moderate (32.2% vs 26.7%, $p<0.01$) and severe (6.0% vs) 4.3%, $p<0.01$) malnutrition, obesity (74.1% vs 50.3%, $p<0.001$), the presence of diabetes in siblings (49.3% vs 38.5%, $p<0.05$), ECG signs of LVH (72.8% vs 62.7%, $p<0.05$) and clinical signs of cerebrovascular atherosclerosis (51.0% vs 36.6%, $p<0.01$) in men has been identified as a relatively statistically significant.

Hypertriglyceridemia in men (22.9% vs 17.8%, $p<0.01$), hyperuricemia (7.8% vs 4.2%, $p<0.001$), and in women with total cholesterol (80.8% vs 74.5%, $p<0.05$), increase in hs-CRP (63.5% vs 53.8%, $p<0.05$), decrease in HDL-C (88.0% vs 78.6%, $p<0.05$) and hypercreatininemia (18.3% vs 14.3%, $p<0.001$) predominated. The studied quality of life indicators included mild pain, discomfort (57.8% vs 52.0%, $p<0.01$), movement (1.9% vs 0.5%, $p<0.05$), and daily activity (11,2% vs 6.0%, $p<0.001$) in men with severe problems associated with movement (79.3% vs 67.7%, $p<0.05$) and daily activity (53.4% vs 33.5%, $p<0.001$), certain problems, severe pain, discomfort (34.6% vs 22.4%, $p<0.01$), anxiety, depression (50.4% vs 35.4%, $p<0,01$) was found in more women. In the survey, male diabetic patients reported a significant improvement in clinical status

compared to the previous year (13.7% vs 12.8%, p<0.01) and no change (24.2% vs 15.0%, p<0.01), however, women reported worse (72.2% vs 62.1%, p<0.01) (Figure 1).

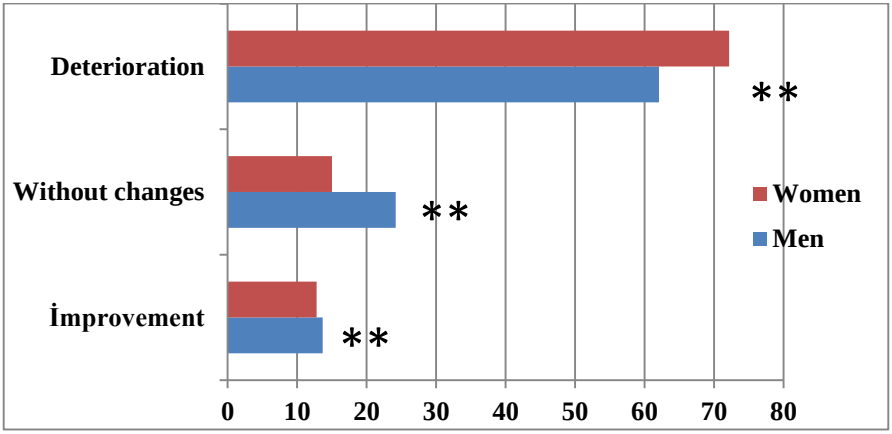

Figure 1. Changes in quality of life indicators in dynamics
*Note: ** - honesty of the difference between men and women.*

As can be seen, in patients with DM2 is also affected by adequate glycemic control, dyslipidemia, kidney damage, etc. it is important to regularly take into account the gender characteristics of patients for each geographical region and to choose an individual approach to them in order to adequately implement prevention and treatment measures to improve indicators, quality of life.

As for the age-related characteristics of patients, the prevalence of hypertension in diabetic patients , the frequency a increased with age. As can be seen from Table 2, the highest frequency was observed in those ≥60 years, when only systolic BP was directly proportional to the age of the patients. The incidence of MI, arrhythmias, and ECG symptoms of CHD in those aged ≥60 years was also high, inadequate glycemic control was more severe at this age, and symptoms of CHF increased statistically with age.

Table 2
Frequency of cardiovascular complications and other indicators in different age groups

Age / Indicators	≤49 (n═142)	50-59 (n=264)	≥60 (n=122)
AH	69.7±3.86	79.6±2.48●	94.3±2.09●♦
CHD (angina)	8.5±2.34	12.1±2.01	13.1±3.05
Angina pectoris (ROSE survey)	19.7±3.34	21.2±2.52	21.3±3.71
Mİ	4.9±1.81	6.4±1.51	12.3±2.97●
Arrhythmia	8.5±2.34	11.7±1.98	15.6±3.28●
CHF	11.3±2.65	27.3±2.74●	43.4±4.48●♦
LVH (ECG)	61.3±4.08	66.3±2.91	70.5±4.13
Mİ (EchoCG)	12.0±2.73	14.0±2.13	18.9±3.54
CHD (ECG)	4.9±1.81	11.7±1.98	14.8±3.21●
Glycemia ≥7 mmol/l	71.2±3.80	67.4±2.88	74.6±3.94
HbA1c >7%	16.9±3.14	21.2±2.51	28.7±4.09●
Systolic BP ≥140 mmHg	38.7±4.08	53.0±3.07●	69.7±4.16●♦
Diastolic BP ≥90 mmHg	31.0±3.88	35.2±2.94	35.2±4.32

Note: AH - arterial hypertension, BP - blood pressure, MI - myocardial infarction, MI (ECG) - ECG signs of myocardial infarction, CHF - chronic heart failure, HbA1c – glycohemoglobin (here and next figure, in the tables), CHD - coronary heart disease, LVH (ECG) - ECG signs of left ventricular hypertrophy, CHD (ECG) - ECG signs of coronary heart disease, ● - compared with the age group ≤49, ♦ - statistical accuracy of the difference compared with the age group 50-59.

Significant results have also been obtained in the study of risk factors and the regional prevalence of CVD in patients with diabetes. Thus, compared to the capital in the regions, secondary (52.0% vs

30.9%, p<0.001), incomplete secondary education (10.6% vs 4.0%, p<0.001), smokers (15.9% vs 10.0%, p=0.043), excessive alcohol consumption (15.9% vs 10.3%, p=0.047), moderate (36.1% vs 26.2%, p=0.013) and severe malnutrition disorders (7.0% vs 4.3%, p=0.013), clinical manifestations of anxiety (59.0% vs 33.6%, p<0.001) and depression (47.1% vs 21.6%, p<0.001), high stress (55.9% vs 42.9%, p=0.006), hyperglycemia (87.4% vs 78.1%, p=0.010), HbA1c ≥7% (89.8% vs 74,7%, p=0,024), MAU (47.9% vs 29.7%, p=0.001), the incidence of these patients was high. Those living in Baku have higher education (43.5% vs. 15.0%, p<0.001), work (44.9% vs 20.3%, p<0.001), and use low and moderate amounts of alcohol (67.1% vs 57.3%, p=0.047), mild malnutrition (40.2% vs 37.0%, p=0.013), subclinical anxiety (36.9% vs 27.3%, p<0.001), moderate (52.2% vs 41.9%, p=0.006) and low-grade stress (5.0% vs 1.8%, p=0.006), hypercreatininemia (20.4% vs 12.6%, p=0.018) and GFR <90 ml / min. patients (62.0% vs 48.7%, p=0.004) predominated. People living in the regions of the country have problems with movement (82.8% vs 72.1%, p=0.001), self-care (52.9% vs 30.6%, p=0.001), daily activity (67.4% vs 45,5%, p=0.001), those who feel pain during the day, discomfort (88.1% vs 82.1%, p=0.001), those who feel anxiety, depression (56.4% vs 38.2%, p=0.001) and those whose general condition worsened compared to the previous year (82.4% vs 59.1%, p=0.001), while those in Baku did not change the situation (23.6% vs 10.1%, p=0.001) and felt better (17, 3% vs 7.5%, p=0.001) was observed.

Thiazide-like diuretics (0.8% vs. 0.6%, p=0.001) in patients with DM2 living in Baku with hypertension (84.4% vs 74.9%, p=0.007), monotherapy with angiotensin II receptor blockers (2.0% vs 0.6%, p=0.001), using combined antihypertensive therapy (47.6% vs 23.5%, p=0.001), while receiving antihypertensive therapy on a regular basis (59.8 % vs 44.9%, p=0.024), only dietary therapy in the treatment of diabetes (4.0% vs 1.8%, p=0.006), monotherapy with biguanide (5.3% vs 3.5%, p=0.006), the incidence of patients receiving combined antidiabetic therapy (46.2% vs 35.2%, p=0.006) was higher than in the regions (Figure 2).

Different types of arrhythmias in diabetic patients in Baku (14.0% vs 8.4%, p=0.047), CHF (32.9% vs 18.5%, p=0.001), cataracts (42.0% vs 20.3%, p=0.001), hypertensive angiopathy

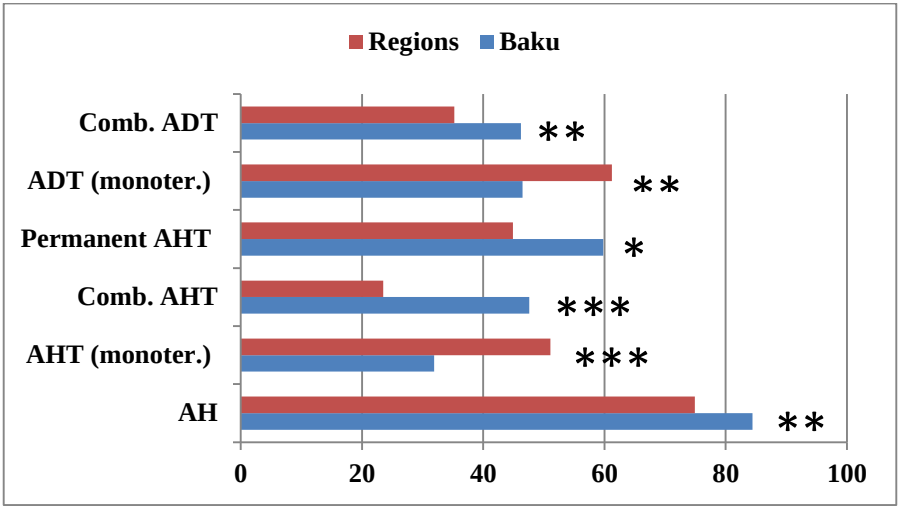

Figure 2.. Regional characteristics of treatment tactics (%)
*Note: ADT - antidiabetic therapy, AHT - antihypertensive therapy, *, **, *** - accuracy of the difference between the regions.*

(38.5% vs 5.4%, p=0.001), circulatory encephalopathy (32.7% vs 12.8%, p=0.001), sonographic remodeling of the heart muscle and the incidence of aorta atherosclerosis (42.6% vs 23.8%, p=0.001) was higher in patients living in the regions. In the regions, in the treatment of angiotensin-converting enzyme inhibitors (42.9% vs 23.2%, p=0.001), monotherapy with calcium channel blockers (4.1% vs 3.1%, p=0.001), receiving inadequate antihypertensive treatment (5.3 % vs 2.8%, p=0.001), while a only sulgonylurea drugs in the treatment of DM2 (27.3% vs 20.9%, p=0.006), when antihypertensive therapy is used only in the presence of elevated BP (45.6% vs 33.5%, p=0.001) and in the form of a course (9.6% vs 6.7%,

p=0.024), patients receiving insulin monotherapy (30.4% vs 19.6%, p=0.006) were more common. Atherosclerosis of the lower extremeties (77.1% vs 58.8%, p=0.001), signs of vertebro-basilar insufficiency (43.6% vs 22.6%, p=0.001), based on surveys and objective examination in the regions compared to those living in the capital, ED (97.5% vs. 83.8%, p=0.01), with optic nerve atrophy (1.5% vs 0%, p=0.049), diabetic encephalopathy (45.3% vs 7.0%, p=0.001) and patients with diabetic polyneuropathy (76.4% vs 43.0%, p=0.001) predominated. It was also found that the DM2 Azerbaijani population also has socio-demographic, behavioral risk factors, quality of life indicators, target organ damage, and antihypertensive and antidiabetic treatment tactics in urban and rural areas, reflected in the results.

Despite unsatisfactory glycemic control (mean glucose 10.4± 1.5 mmol/l, HbA1c - 7.9±0.7%), 2.7±0.7% of patients did not receive antihyperglycemic treatment at all, the majority (94.3±1.4%) were on mono- and combination antidiabetic therapy, and no statistically significant gender differences were noted in treatment tactics. 3.0± 0.7% of patients were satisfied with diet alone in the treatment of diabetes, 4.5±0.9% metformin, 23.7±1.8% sulfonylurea drugs, 24.2± 1,9% used only insulin monotherapy, and 41.5±2.1% used combined antihyperglycemic therapy.

Patients received sulfonylurea preparations as follows: glyclaside (diabeton MR) - 59 patients (47.2%), glimepiride (amaril) - 43 patients (34.4%), glibenclamide (maninil) - 16 patients (12.8%), glycvidone (glurenorm) - 6 patients (4,8%), glipizide (minidiab) - 1 patient (0.8%).

Only 50.8% of those receiving insulin therapy received monotherapy and 49.2±1.9% received a combination of insulin preparations. 10.1% of the prescribed insulin drugs were short-acting, 1.6% short-acting and medium-effective, 25.8% moderate and 13.3% long-acting.

Only 2 patients (0.4±0.3%) received rosiglitazone from the thiazolidondion group, against which the average plasma glucose concentration was found to be above normal (10.8±4.4 mmol / l).

Mean glycemia was higher in patients receiving metformin, sulfonylurea, insulin therapy, and combined antihyperglycemic therapy than in untreated patients (11.2 mmol/l vs 10.4 mmol/l, $p<0.05$; 11.3 mmol/l vs 10.4 mmol/l, $p<0.05$; 12.2 mmol/l vs 10.4 mmol/l, $p<0.01$; 11.4 mmol/l vs 10.4 mmol/l, $p<0,01$, respectively), and no statistically significant difference was found in HbA1c (7.78% vs 7.88%, $p>0.05$; 8.33% vs 7.88%, $p>0.05$; 9,14% vs 7.88%, $p>0.05$; 9.28% vs 7.88%, $p>0.05$, respectively).

75.3% (n=165) of patients with DM2 received 2 combinations, 22.4% (n=49) received 3 and 2.7% (n=6) received 4 combinations of antidiabetic treatment. Metformin + glibenclamide (n=46; 21.0%), glimepiride + metformin (n=47; 21.5%), glyclazide + metformin (n=30; 13.6%), metformin + insulin glargine (Lantus) (n=3; 1.3%), acarbose + repaglinide (novonorm) (n=1; 0.5%), glibenclamide + isophane insulin (Insulatard) (n=4; 1.8%), metformin + isophane insulin (Insulatard) (n=8; 3.6%), glyclazide + isophane insulin (Insulatard) (n=5; 2.2%), glimepiride + isophane insulin (Insulatard) (n=3; 1.4%)), glimepiride + insulin glargin (Lantus) (n=2; 0.9%), metformin + detemir insulin (Levemir) (n=2; 0.9%), metformin + 2-phase insulin aspart (Novomix) (n=1; 0.5%), metformin + soluble insulin (Actrapid) (n=2; 0.9%), metformin + 2-phase insulin aspart (Novomix) (n=1; 0.5%) tactics are effective, insulin glargin (Lantus) + glitazone (n=1; 0.5%), glibenclamide + glyclazide (n=1; 0.5%), glyclazide + 2-phase insulin aspart (Novomix) (n=2; 0.9%) , glyclazide + human insulin (Mixard) (n=2; 0.9%), glibenclamide + soluble insulin (Actrapid) (n=1; 0.5%), glyclazide + soluble insulin (Aktrapid) (n=3; 1.4%) treatments were ineffective. 3 combination antidiabetic treatment glibenclamide + metformin + insulin glargin (Lantus) (n=2; 0.9%), glibenclamide + metformin + isophane insulin (Insulatard) (n=5; 2.3%), metformin + soluble insulin (Actrapid) + isophane insulin (Insulatard) (n=5; 2.3%), glyclazide + metformin + insulin qlargin (Lantus) (n=3; 1.4%), glimepiride + metformin + insulin qlargin (Lantus) (n=4; 1 , 8%), glibenclamide + metformin + soluble insulin (Actrapid) (n=2; 0.9%), metformin + glimepiride + insulin glargin (Lantus) (n=2; 0.9%), metformin + soluble insulin

(Actrapid) + 2-phase insulin aspart (Novomix) (n=1; 0.5%), metformin + glibenclamide + detemir insulin (Levemir) (n=2; 0.9%), metformin + glimepiride + pioglitazone (n=1; 0.5%), metformin + insulin aspart (Novorapid) + detemir insulin (Levemir) (n=2; 0.9%), metformin + glimepiride + isophane insulin (Insulatard) (n=2; 0,9%), repaglinide + isophane insulin (Insulatard) + metformin (n=1; 0.5%), metformin + human insulin (Mikstard) + soluble insulin (Actrapid) (n=2; 0.9%) effective, glyclazide + metformin + glibenclamide (n=1; 0.5%), glyclazide + isophane insulin (Insulatard) + soluble insulin (Actrapid) (n=3; 1.4%), glyclazide + glimepiride + metformin (n=2; 0.9%), metformin + glimepiride + human insulin (Mixard) (n=2; 0.9%), metformin + glimepiride + glibenclamide (n=2; 0.9%), glibenclamide + soluble insulin (Actrapid) + detemir insulin (Levemir) (n=2; 0.9%), glibenclamide + soluble insulin (Actrapid) + isophane insulin (Insulatard) (n=2; 0.9%), metformin + glibenclamide + recombinant human insulin (Humulin Regular) (n=1; 0.5%) were considered ineffective. 2 patients (0.9%) received 4 combination hypoglycemic treatments consisting of glyclazide + metformin + insulin glargin (Lantus) + glibenclamide, 2 (0.9%) - metformin + glibenclamide + soluble insulin (Actrapid) + isophane insulin (Insulatard), 2 (0.9%) - metformin + glimepiride + soluble insulin (Actrapid) + insulin glargine (Lantus). Thus, 93.9% of those receiving 2-component treatment, 69.4% of 3-component treatment were effective, 6.1% of 2-component treatment, 30.6% of 3-component treatment, and all of the 4-component treatment were non-effective (Figure 3).

Adequate control of glycemic status has not been achieved against the background of various antidiabetic treatment regimens. Although 97.3±1.0% of DM2 patients received treatment, 81.0% of them had poor glycemic control, which should be considered unsatisfactory.

Obesity (especially abdominal type) was found in patients, regardless of antidiabetic treatment regimens, hypercholesterolemia, hypertriglyceridemia in all groups, increased levels of hs-CRP, a marker of cardiovascular risk, symptoms of CKD (MAU of varying

severity and GFR decrease) was determined. Sonographically, the frequency of detecting IMT>0.9 mm in carotid arteries was greater than the objective sign of lower peripheral arterial stenosis (ABI<0.9).

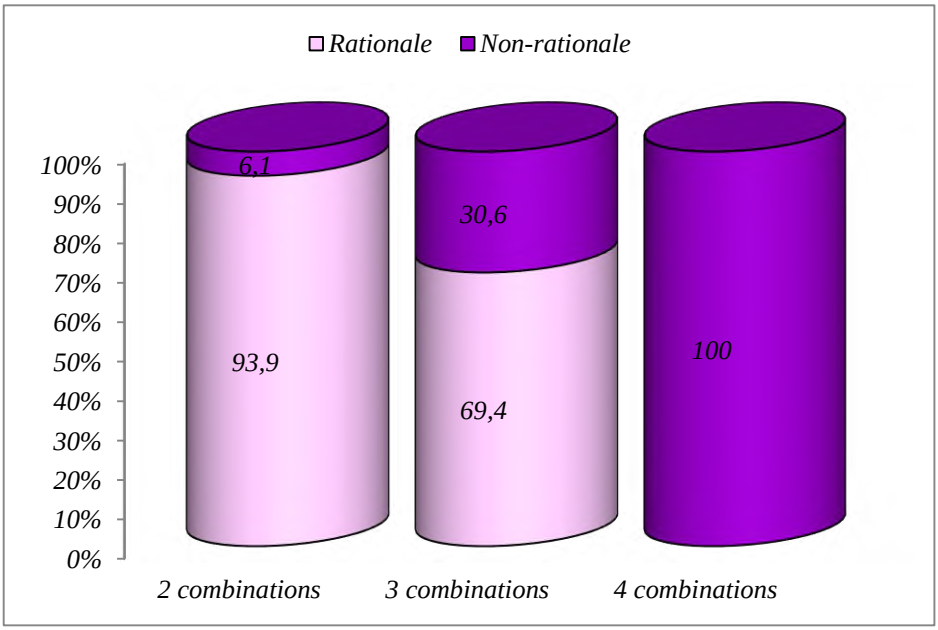

Figure 3. Features of combined antihyperglycemic treatment regimens

MI (10.8±2.8%) and EchoCG signs of left ventricular diastolic dysfunction (39.6±4.8%) in the background of treatment with sulfonylurea drugs only were compared with those who did not receive treatment in general (33,3±13.6% and 75.0±12.5%, respectively) were relatively low ($p<0.05$). In the studied population, hypertension was more common in cardiovascular pathologies (54.8%), its lowest frequency in those who did not receive antidiabetic treatment (42.9±13.2%), and the highest rate of arrhythmias only

in those receiving diet therapy (18, 8 ± 9.8%) were noted. The ROSE survey found the highest number of CHD (22.6%). At the time of the survey, the symptoms of CHD were higher in monotherapy with biguanide (41.7±10.1%), and the ECG values of CHD were generally higher in those who were not treated (16.7±10.8%). Compared with the survey (6.8%), the frequency of ECG criteria for MI was higher (18.9%), which was more pronounced in patients who did not receive antihyperglycemic therapy (33.3±13.6%). Echocardiographic indicators of left ventricular diastolic dysfunction (55.3%) were found to be approximately 2 times higher than the clinical signs of CHF (27.2%). EchoCG signs of diastolic dysfunction was highest in those not receiving antidiabetic treatment (75.0±12.5%). Thus, it has been proven once again that multifactorial management of the disease is important in the prevention of cardiovascular complications in patients with DM2. As can be seen, the various antihyperglycemic treatment tactics used in diabetic patients have not played a significant role in the prevention of CVD. Along with adequate correction of hyperglycemia in the reduction of the incidence of these diseases, the use of antihypertensive, hypolipidemic and antiplatelet drugs in the correct and optimal doses increases the patient's adherence to these treatment regimens. Neutralization of modified risk factors, etc. factors are important.

A study of the relationship between glycemic status and risk factors and CVD found that no statistically significant relationship was found between patients' age, daily life anxiety, stress, quality of life - movement, self-care, daily activity and HbA1c levels. Occupation (22.6±2.3% vs 7.4±2.9%, p=0.010), medium (26.1± 2.4% vs 22.2±4.6%, p=0.010) and in patients with incomplete secondary education (2.6±0.9% vs 0%, p=0.010), not working (51.3 ±2.7% vs 33.3±5.2%, p=0.004), who consumes alcohol (80.8±1.9% vs 63.0± 3.4%, p=0.002), married (81.7±2.1% vs 74.1±4.9%, p=0.019) and divorced (3.5±1.0% vs 0%, p=0.019), grade I (44.3±2.7% vs 33.3± 5.2%, p=0.002), with grade III (13.9±1.9% vs 3.7±2.1%, p=0.002) and abdominal obesity (99.1±0.5% vs 92.6±2.9%, p<0.001), patients suffering from pain, discomfort during the survey (24.3±2.3% vs 3.7

±2.1%, p<0.001), anxiety, depression (36.5±1.7% vs 14.8±2.8%, p<0.001) and glycemic control significantly deteriorated. Compared to the previous year, 55.7±4.6% of patients with poor glycemic control reported a worsening of their clinical condition, while 28.77 ±4.2% reported no change. Increased duration of diabetes and hyperglycemia had a negative impact on the course of the disease, which in turn led to a deterioration in the quality of life of patients. Therefore, the role of risk factors that adversely affect the optimal management of glycemia in patients with DM2 should be assessed in a timely manner and the main preventive measures should be aimed at the timely correction of these predictors. Only in this case, it is possible to prevent very serious complications of the disease in the target organs, significantly reduce the rate of early disability, mortality due to the disease and related health expenditures from state budgets.

Hypertension (77.8±4.6% vs 83.5±2.0%, p=0.225), and the severity of hypertension (55.5±6.2% vs 82.6±4.2%, p<0.001), frequency of ECG signs of LVH (60.0±5.7% vs 74.3±2.4%, p=0.013) and EchoCG symptoms of LVH (56.0±5.7% vs 56.9± 2.8%, p=0.893) was more common in poor control than in good control. Patients received less antihypertensive therapy on a regular basis (63.0±3.1% vs 78.9±5.4%, p=0.033) when BP was elevated (30.9±3.0% vs 21.1±5.4%, p=0.033) compared with inadequate glycemic control and in the form of a course (6.2±1.5% vs 0%, p=0.033). In patients with HbA1c≥7%, angina pectoris (7.0% vs 3.7%, p<0.05), ECG signs of CHD (26.7% vs 8.0%, p<0,01), sonographic signs of aortic atherosclerosis (46.7% vs 24.0%, p<0.01), history of MI (6.1% vs 3.7%, p<0.05) and its ECG signs (37.1% vs 16.0%, p<0.01), hypokinesia in the heart muscle (33.3% vs 20.0%, p<0.05) and akinesis (21.0% vs 4.0% , p<0,01) was also observed. Poor glycemic control increased the incidence of arrhythmias (22.2% vs 15.7%, p>0.05), CHF (40.0% vs 33.3%, p>0.05), left ventricular diastolic (54.9% vs 44.0%, p>0.05) and systolic dysfunction (20.6% vs 4.0%, p<0.05), increased the final diastolic volume of the right ventricle in these patients (0.490±0.03

cm vs 0.474± 0.01 cm, p=0.034), right atrium size (3.39±0.02 cm vs 3.22±0.05 cm, p=0.030) and pulmonary artery diameter (1.91±0,02 cm vs 1.86±0.01 cm, p=0.023). Cerebral stroke (5.2±1.2% vs 0%, p=0.073) and severe (>50%) carotid artery stenosis (73.9±3.7% vs 57.1±5.8%, p=0.063) have been reported in patients with poor glycemic control, inadequate glycemic control increased IMT (1.24± 0.07 mm vs 1.20±0.12 mm, p=0.025). Regardless of the level of glycemic status, the blood circulation in the lower extremities was mainly of the trunk type, the incidence of severe stenosis of arteries towards the periphery increased, circulatory disorders were mainly in the subcompensation and decompensation in the knee-ankle segments. Inadequate glycemic control in patients with DM2 has been shown to increase the incidence of macrovascular complications and hypertension.

Average HbA1c (9.42±0.18%; 95% CI 9.06-9.78) in patients with DM2 with inadequate glycemic control (6.27±0.10%; 95% CI) 6.07-6.46) was more than 50.3% (p<0.001). Regardless of glycemic status, the detection rate was the same for those not receiving antidiabetic therapy and only for those on diet (3.5±1.0% vs 3.7± 2.1%, p>0.05, respectively), with good glycemic control biguanide (11.1±3.5% vs 6.1±1.3%, p>0.05), sulfonylurea preparations (33.3± 5.2% vs 26.1±2.4%, p>0.05) and those receiving insulin monotherapy (18.5±4.3% vs. 14.8±1.9%, p>0.05), and those receiving combined antidiabetic therapy in poor control (46.1± 2.7% vs 29.6 ± 5.1%, p>0.05) predominated (Figure 4).

The incidence of diabetes in children with poorly controlled glycemia (22.6±2.3%) was higher than in well-controlled (3.7± 2.1%) (p<0.001), poor glycemic control also increased ED (70.8% vs 22.2%, p=0.034, respectively) and incidence of menopause (83.5% vs 61.1%, p=0.031). MAU (49.1% vs 16.7%, p=0,025), diabetic retinopathy (35.6±2.7% vs 25.0±5.1%, p=0.087), diabetic polyneuropathy (45.8±2.8% vs 20.8±4.8%, p<0.001) and a decrease in the mean GFR (80.9±1.7 ml/min/1.73 m² vs 89.5±4.4 ml/min/1.73 m², p=0.039) was observed more in cases of inadequate glycemic control.

Poor glycemic control was accompanied by increased concentrations of total cholesterol (5.44 ± 0.08 mmol/l vs 5.30±0.16 mmol/l, p=0.458), non-HDL-C (4.39±0.07 mmol/l vs 4,0±0.07 mmol/l, p=0.027), TG (2.25±0.07 mmol/l vs 2.04±0.03 mmol/l, p=0.175), hs-CRP (8.08±0.84 mg/l vs 6.65±1.07 mg/l, p=0.372), creatinine

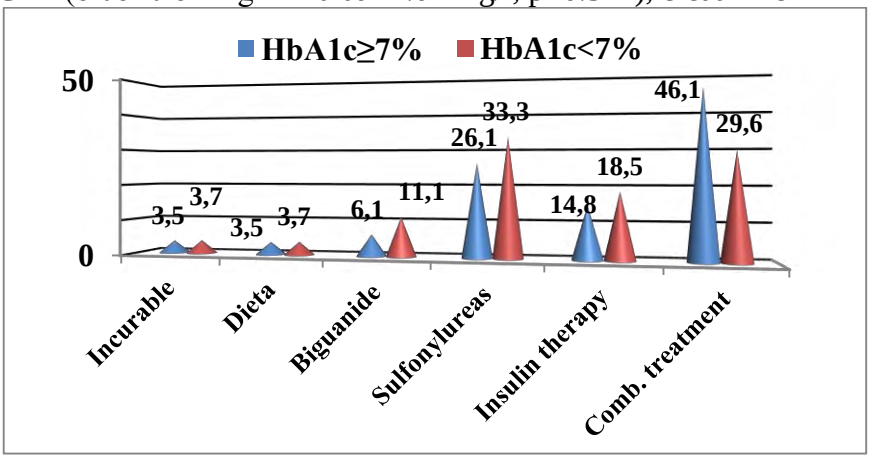

Figure 4. Status of glycemia control during antidiabetic treatment tactics (%)

(87.1±2.5% μmol/l vs 86.0±5.0 μmol/l, p=0.849) and uric acid (279.9±5.3 μmol/l vs 246.2±14.7 μmol/l, p=0.011). It was found that glycemic control was worse in patients with DM in their children, inadequate glycemic control was associated with a statistically significant increase in the incidence of ED, menopause, MAU, diabetic polyneuropathy, and a decrease in GFR. It has once again been found that adequate glycemic management is important in the prevention of complications of diabetes by various organs.

The low frequency of effective antidiabetic treatment regimens in the DM2 patients involved in the study led to the decompensation of diabetes, the acceleration of microvascular complications, and the deterioration of lipid profile and inflammatory marker indicators.

Numerous studies have shown that the combined observation of DM2 and hypertension increases the risk of CVD in patients

several times. Therefore, one of the main tasks of our study was to study the clinical and epidemiological situation in this group of patients. The results of the study showed that the frequency of detection of BP in DM2 patients on the basis of the survey was 80.3 ±1.7%, systolic BP (53.4%) was more common than diastolic BP (34.1%). Although 81.4±3.0% of those with hypertension received antihypertensive treatment with various drugs, the target level of BP was not achieved in 57.0±2.2% of them. 43.4±1.0% of patients with hypertension received monotherapy, 38.0±2.4% received combined antihypertensive therapy, and 18.6±1.9% had hypertension however, they generally did not use drug treatment (Figure 5).

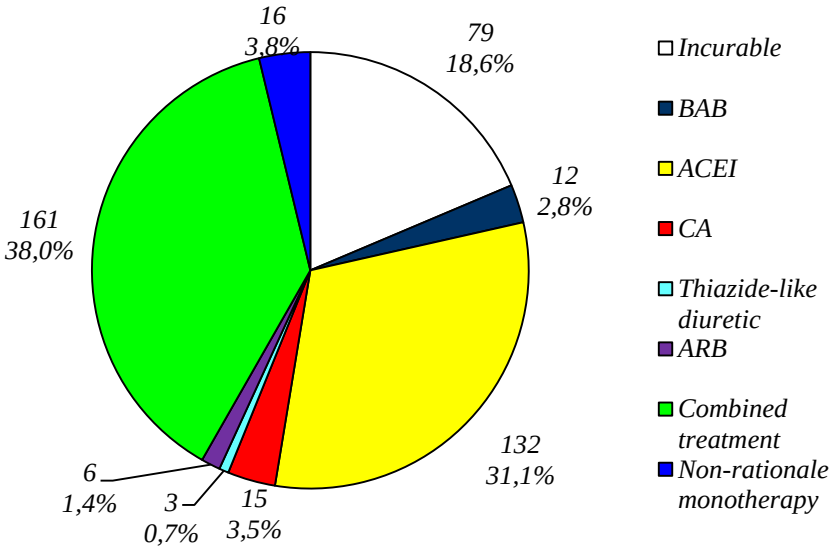

Figure 5. Frequency of antihypertensive treatment regimens
Note: BAB - β-adrenoblockers, ACEI - angiotensin converting enzyme inhibitor, CA - calcium channel antagonist, ARB - angiotensin II receptor blocker.

Effective antihypertensive treatment was prescribed to 69.6% of diabetic cohorts, in 53.9 ± 2.7% this treatment was continuous,

and in 43% of them BP<140 mmHg, ECG signs of LVH (69.7± 2.1%) were more common than EchoCG signs of LVH (54.2± 2.4%). In the prevalence of hypertension in diabetic patients major risk factors such as age (r=0.230, p<0.001), duration of diabetes (r=0.126, p=0.004), increase in BMI (r=0.178, p<0.001), abdominal obesity (r=0.145, p=0.001) and the presence of MAU (r=0.112, p=0.012) played an important role. In view of the above, physicians and patients with DM2 should closely monitor the level of BP in order to prevent vascular complications in the target organs. In this regard, along with the timely, regular identification and correct correction of risk factors that play an important role in the formation of hypertension in each geographical and climatic region, adequate pharmacological management of hypertension is also important.

The prevalence of hypertension was 2.6 times higher in women than in men (72.4±2.2% and 27.6±2.2%, respectively), hypertension was higher in women in 60-69 years (28.7%), and in men and in the age range of 50-59 years (56.4%). Depending on the level of BP, patients employment status (33.7±2.3% vs 36.5±4.7%, p>0.05), alcohol intake (75.0±2.1% vs 77.9±4.1%, p>0.05), low physical activity (54.7±2.4% vs 49.0±4.9%, p>0.05) and eating disorders (74.1±2.1% vs 77.9±4.1%, p>0.05) no statistically significant difference was found, smoking habits in patients with hypertension were about 2 times higher (19.3±1.9% vs 10,6±3.0%, p<0.05, respectively) were recorded. In comparison with normotonics, the parents of patients with hypertension were surveyed on the basis of hypertension (21.9±2.0% vs 12.5±3.2%, p<0.05 in fathers; 42.2±2.4% vs 26,9±4.3%, p<0.01 in mothers, respectively), mothers with DM2 (33.7±2.3% vs 22.1±4.1%, p<0.05), overweight and obesity were found (95.0±1.1% vs 88.5±3.1%, p<0.05), while these patients suffered from abdominal obesity (96.5±0.9% vs 89.4±3.0%, p<0.01). Symptoms of anxiety (78.5±2.0% vs 72.1±4.4%, p<0.05) and depressive symptoms (68.2±2.3% vs 62.5±4.7%, p>0.05) in patients with hypertension predominated. Stress (99.8±0.2% vs 100.0%, p>0.05) was reported in all patients, regardless of BP level, indicating a significant deterioration in quality of life in patients with

hypertension (71,0±2.2% vs 61.5±4.8%, p<0.05). Thus, female sex, an increase in age and BMI, abdominal obesity and anxiety were considered important risk factors for the development of hypertension in the DM2 Azerbaijan cohort, and the presence of hypertension in both parents and DM2 in the mother significantly increased this risk.

Compared with normotonics, in patients with hypertension, CHD (5.8±2.3% vs. 12.7±1.6%, p<0.05), CHF (9.6±2.9% vs 30.9± 2,2%, p<0.001), clinical signs of lower extremiti atherosclerosis (53.8±4.9% vs 69.8±2.2%, p<0.01) and cerebrovascular atherosclerosis (28.8±4.4% vs 50.9±2.4%, p<0.001), previous stroke (0% vs 5.0±1.1%, p<0.05), incidence of hypertensive angiopathy (6.5±2, 5% vs 14.5±1.8%, p<0.05), ECG and EchoCG signs of LVH (45.4± 5.1% vs 75.6±2.1%, p<0.001 and 24.4±4.7% vs 61.1±2.6%, p<0.001, respectively), decrease in left ventricular ejection fraction (7.8± 2.8% vs 12.5±1.7%, p<0.001), left ventricular diastolic dysfunction (23.2±4.7% vs 52.6±2.7%, p<0.001), sonographic signs of aortic atherosclerosis (20.7±4.5% vs 38.0±2.6%, p<0.01), sonographic decrease in ABI (left - 14.9±3.5% vs 29.8±2.3%, p<0.01; right - 9.9 ±3.0% vs 31,5±2.3%, p<0.001), as well as atherosclerotic plaques in the carotid arteries (27.0±7.3% vs 56.8±8.1%, p=0.049) were more common.

Thus, as in other geographical and climatic regions, patients with DM2 living in Azerbaijan have specific features of risk factors that affect the formation of hypertension. By detecting, predicting, and correcting modified risk factors in a timely manner, it is possible to significantly reduce the risk of CVD in diabetic patients. Therefore, there is a serious need for more extensive research in this area, to ensure and improve the adequacy of treatment, prevention and education activities.

The level of education is also important in the prevention of CVD in patients with diabetes. The results of our study showed that compared to those with higher education, systolic BP was incomplete secondary education (49.1±3.9% vs 66.6±7.8%, p<0.05, respectively), and diastolic BP was among those with vocational education

more common (30.9±3.6% vs 42.3±4.8%, p<0.05). According to the ROSE survey, angina pectoris (82.2%) was 1.8 times higher than in the ordinary survey (45.5%), and the symptoms of MI on the ECG (60.0%) were 2.6 times higher than in the survey (23.0%). Anamnestic MI in secondary school (3.3±1.2% vs 9.7±2.3%, p<0.05), various arrhythmias (8.5±1.9% vs 15.1±2.8%, p<0.05) and clinical signs of CHF (22.3±2.8% vs 33.9±3.7, p<0.05), while ECG signs of MI are moderate (11.4±2.2% vs 21.2±3.2%, p<0.05) and in vocational education (10.8±2.9% vs 21.2±3.2%, p<0,05) less common than those with higher education. There was an inverse relationship between the level of education and glycemia, and hyperglycemia was higher in secondary education than in higher education (76.3±2.9% vs 64.8±3.7%, respectively, p<0.05). The worst control of glycemia was observed in incomplete secondary (55.5±8.2%), and the best control was observed in patients with secondary education (14.2±2.4%) (Figure 6).

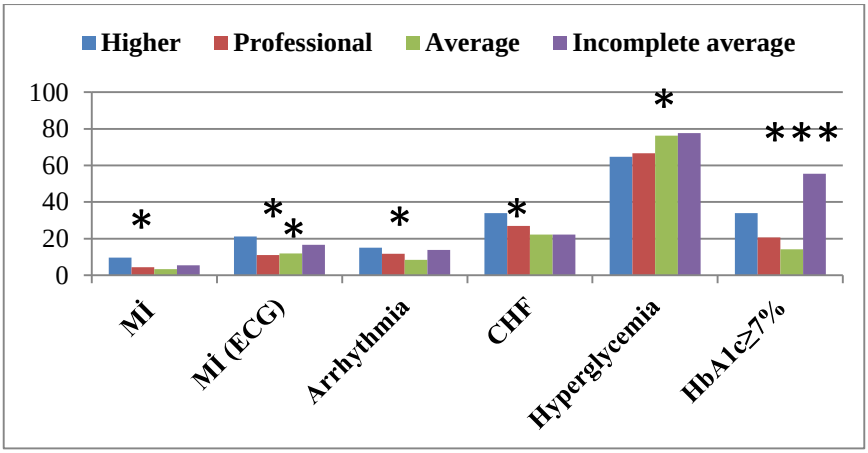

Figure 6. Relationship between education level and indicators (%)
*Note: *, **, *** - levels of accuracy of the difference between the indicators.*

In the DM2 cohort we studied, no significant correlation was found between the level of education and cardiovascular complications and glycemic status. Regardless of the level of education, efforts should be intensified to adequately monitor the progression of diabetes and to combat risk factors more seriously in order to prevent cardiovascular complications among DM2 patients.

One of the most common complications in DM2 patients is ED. Overall, the survey revealed no erectile dysfunction in approximately 1/10 (9.8%) of patients with DM2, and clinical signs of ED in 90.2%. ED was mild in 17.6% of patients, moderate-mild in 26.1%, moderate in 26.8%, and severe in 1/5 of patients (19.7%).

Analysis of the relationship between the age of patients and ED showed that erectile function was abnormal in patients aged 60-69 years with diabetes, and the incidence of this indicator was statistically higher than in other age groups (9.3% in 50-59 years and 16.5% in 30-49 years) (95% CI 2.6–16.0, $p<0.05$, and 95% CI 5.5–27.5, $p<0.01$, respectively). Compared to 50-59 year olds, normal erectile function was observed in more patients in 30-49 year olds (9.3% and 16.5%, respectively, $p<0.05$). Discover the direct correlation between the different severity of ED and the age of the patients has been. Thus, in patients with diabetes mellitus aged 60-69 years, mild ED (35.1%, 95% CI 19.4-50.8) compared with other age groups, in people aged 60-69 years, moderate-mild (35.5%, 95% CI 21.3-49.8), moderate (36.6%, 95% CI 25.2-48.1) and severe ED (22.5%, 95% CI 12.6-32.4) however, it was found to be statistically significant compared to patients aged only 30-49 years.

As for the effects of smoking, sexual function was more normal in patients than in non-smokers (21.7% and 7.7%, respectively, $p<0.05$). In contrast, mild (21.7% and 12.0%, $p<0.05$, respectively), moderate-light (30.4% and 21.4%, $p<0.05$, respectively) and moderate ED (30.0% and 18.7%, respectively, $p<0.05$) predominated in smokers. Although severe ED was found to be slightly higher in non-smokers than in smokers, this difference did not reach statistical accuracy (20.0% and 17.4%, respectively, $p>0.05$).

Approximately 1/5 of diabetic patients with low to moderate alcohol consumption (21.7%, 95% CI 4.5-39.0) had normal erectile function, and this indicator indicates excessive use of alcohol (7, 0%, 95% CI 1.9-12.1) and not used at all (10.3%, 95% CI 1.0-19.6) were statistically higher ($p<0.01$). Those with low and moderate alcohol intake had mild (13.9%, 95% CI 7.1-20.7), moderate-mild (22.8%, 95% CI 14.4-31.2) and moderate (8.7%, 95% CI 3.1-14.3), the incidence of ED in overdose of alcohol (27.6%, 95% CI 10.4-44.8; 30.4%, 95% CI 11.2-49.6 and 35.6%, 95% CI 26.1-45.1, respectively) and those who do not use at all (25.7%, 95% CI 9.2-42.2; 34,5%, 95% CI 16.9-52.1 and 29.3%, 95% CI 15.3-43.3) were statistically less observed. No distinct effect of alcohol intake status on severe ED was observed in almost all 3 groups (17.2% in non-alcoholics, 20.9% in low- and moderate-alcohol users, and 17.4% in overdoses), the difference between the same and the indicators was statistically inaccurate.

From the association between BMI and erectile function, it was concluded that the highest incidence of normal erectile function was observed in patients with normal BMI DM2 (18.2%) and that this figure was statistically higher than in those with grade II and III obesity (7.7% and 4.8%, respectively, $p<0.05$). Mild ED was most commonly reported in patients with severe obesity (28.6%) and differed significantly from those with only grade II obesity (10.2%) ($p<0.05$). Moderate-to-mild ED was most commonly found in people of normal weight (45.4%), and moderate ED was found in people with grade II obesity (43.6%). There was no statistically significant difference in the prevalence of severe ED depending on the BMI (respectively, <25 kg/m² - 18.2%; 25-29 kg/m² - 18.2%; 30-34 kg/m² - 18.2%; 35-39 kg/m² - 18.2%; ≥ 40 kg/m² - 18.2%).

BP<140/90 mmHg although the frequency of normal erectile function was higher in diabetic patients than in patients with hypertension, this difference was not statistically significant (10.7% and 7.5%, $p>0.05$, respectively) (see Figure 7). A direct correlation was found between the severity of erectile function and the level of BP. In mild (13.0% and 15.2%, respectively) and severe (18.7% and

20.5%, respectively) ED, the difference was not statistically significant, but moderate-mild (21.5%, 95% CI 11.3-31.7 and 29%, 95% CI 16.4-41.6, respectively) and moderate (20.5%, 95% CI 9.7-31.3 and 34,1%, 95% CI 20.6-47.6, respectively) differed in statistical accuracy ($p<0.05$) during ED.

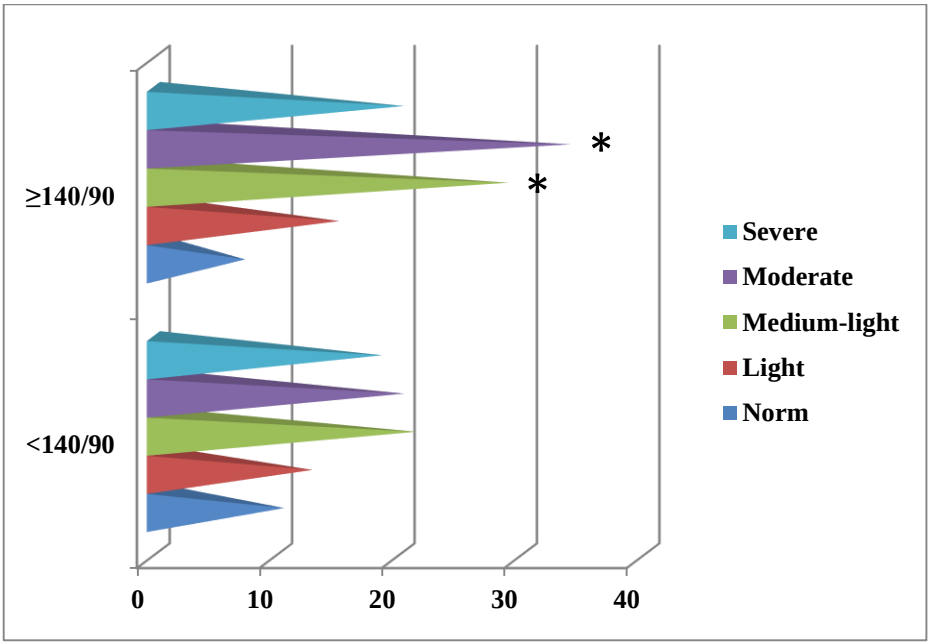

Fig. 7. Frequency of ED depending on the level of BP (%)

The survey did not reveal a statistically significant difference in the frequency of normal erectile function in patients with low physical activity and normal physical activity (Table 3). Although mild to moderate ED is less common in diabetic patients with normal physical activity than in those with a sedentary lifestyle, the opposite has been reported in patients with moderate ED. The prevalence of severe ED did not depend on the form of physical activity.

An inverse relationship was found between the duration of diabetes and normal erectile function, and a direct correlation

between the prevalence of different severity of ED. The highest number of patients with normal erectile function in patients with diabetes up to 5 years (25%, 95% CI 18.3-31.7), which differed from other indicators with statistical accuracy (6-10 years - 16.7%, $p<0.05$; 11-15 years - 11.1%, $p<0.05$; 16-20 years - 9.7%, $p<0.01$; ≥21 years - 5.5%, $p<0.01$, respectively). Mild ED was diagnosed in

Table 3

Relationship between physical activity and ED (%)

FA / ED	Low mobility	Normal FA
Normal	9.0	10.7
Light	20.5*	14.7
Medium-light	30.8*	21.3
Average	20.5	33.3*
Severe	19.2	20.0

*Note: FA - physical activity, ED - erectile dysfunction. * - p<0,05.*

14.9% of individuals with the shortest duration of diabetes (<1-5 years) (95% CI 5.2-29.6), and in those with the longest duration of the disease (≥21 years) the indicator increased to 33.3% (95% CI 1.9-64.7, $p<0.01$). Similar changes were observed in patients with moderate-mild, moderate, and severe ED diabetes, depending on the duration of the disease.

A direct correlation was observed between the severity of HbA1c and the prevalence of ED (Figure 8). Only 1/5 (20%) of patients with adequate glycemic control did not show erectile dysfunction during the survey, while those with inadequately controlled glycemia had approximately 2 times less (12.2%) ($p<0.05$). Mild, moderate-mild, moderate, and severe ED were more common in those with poor glycemic control than in those with good control (19.5% vs 10.0%, 50.0% vs 24.4%, 12.2% vs 4,5%; 20.0% vs 10.6%, respectively.). Based on the level of glycemic status control, the differences between the incidence frequencies of different severity of ED were statistically significant ($p<0.05$).

A study of erectile function in patients with diabetes revealed that in our population, age, BMI, duration of diabetes, increased BP, smoking, alcohol abuse, physical inactivity, and inadequate glycemic control were associated with different severity of ED were predictors of the formation of degrees. The risk factors studied had a combined effect on the frequency and severity of ED detection.

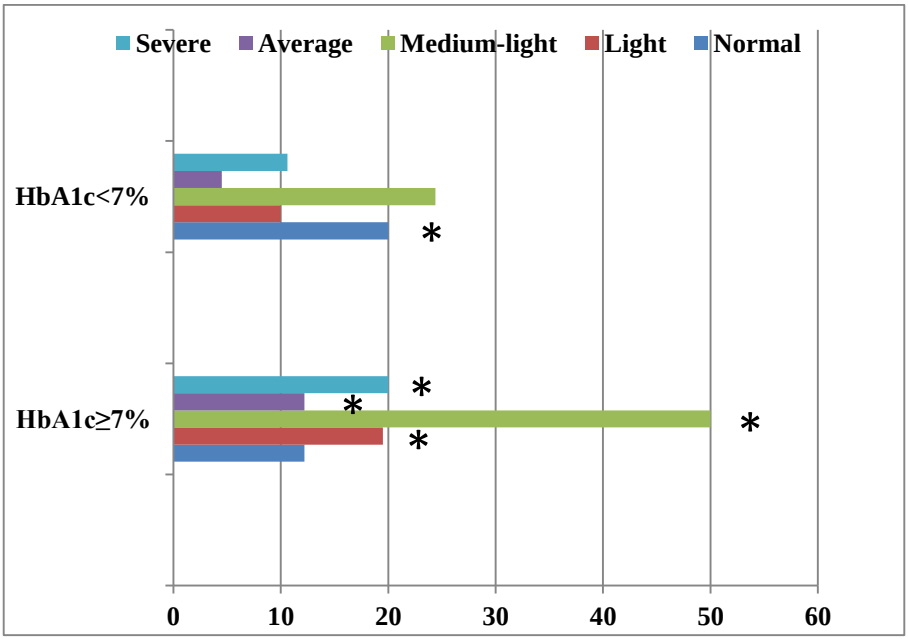

Figure 8. Association between HbA1c and severity of erectile dysfunction (%)

*Note: * - the level of accuracy of the difference between the indicators.*

Therefore, the implementation of adequate treatment and prevention in patients with DM2 can improve their erectile function, quality of life and, consequently, have a positive impact on the prognosis of CVD.

One of the organs damaged by diabetes is the kidneys, and this pathology is important in the formation of CKD. In our study, we also analyzed the relationship between various indicators and the criteria for CKD, which is a microvascular complication of diabetes. No statistically significant correlation was found between patients' sex, education levels, family status, and MAU and GFR. As patients age, a decrease in GFR was observed ($p<0.001$), and patients' employment had an antialbuminuric effect ($p=0.043$). An increase in the duration of diabetes was accompanied by an increase in MAU and a decrease in GFR ($p<0.001$). In the majority of patients whose fathers had angina pectoris and MI (18.9% each) had a GFR<60 ml / min. has been found to be.

No statistically significant association was found between smoking in patients with DM2 and MAU and GFR, and albuminuria was not found in the largest number of patients (72.6%) in low- and moderate-alcohol drinkers. The decrease in GFR was accompanied by a decrease in BMI, with an increase in chronic uremia, the patient's weight decreased ($p<0.001$), which can be associated with decompensation of CKD. The majority of patients with reduced GFR suffered from overweight and obesity, and 86.5% of them had GFR<60 ml/min. ($p<0.001$). At the same time, a statistically significant decrease in abdominal obesity was observed in patients with reduced GFR ($p<0.001$). Low physical activity was associated with progressive albuminuria ($p=0.011$), with low physical activity reaching 75% in those with 300 mg/dl MAU, compared with 30 mg/dl MAU in approximately half of physically inactive diabetics. A statistically significant association was found between the presence of MAU ($p=0.006$) and the decrease in GFR ($p=0.003$), mainly with moderate stress.

In all patients with MAU and decreased GFR, mean hyperglycemia was high (>10 mmol/l) and glycemic control was poor (HbA1c>7.9%), but the relationship between these values did not reach statistical accuracy. A direct relationship ($p=0.040$) was found between MAU and non-HDL-C. The increase in TG, creatinine, and uric acid levels was associated with progression of MAU ($p<0.001$)

and a decrease in GFR (respectively (p=0.056; p<0.001; p<0.001). The inverse relationship between MAU and GFR, as the increase in MAU was accompanied by a decrease in GFR and a decrease in GFR was accompanied by an increase in MAU (p<0.001).

The increase in albuminuria was accompanied by an increase in the incidence of EchoCG symptoms of LVH and a decrease in the left ventricular ejection fraction (Table 4). This result further confirms that MAU is a serious predictor of not only renal damage but also cardiovascular events in diabetic patients.

Table 4
Relationship between MAU and EchoKG indicators

Indicators	Gradation	MAU (mg/dl)				p
		0	30	100	300	
LVH (EchoCG), n (%)	There is no	124 (48.1)	59 (48.0)	5 (23.8)	2 (15.4)	0.022 (Krus-kal-Wallis)
	There is	134 (51.9)	64 (52.0)	16 (76.2)	11 (84.6)	
Left ventricular ejection fraction, %	M±m (95% Cİ)	299 55.9±0.2 (55.4-56.3)	129 57.4±0.3 (56.7-58.1)	23 56.2±1.0 (54.0-58.4)	15 55.3±1.0 (53.1-57.6)	0.003 (Fi-sher)

Note: EchoCG - echocardiography, LVH - left ventricle hypertrophy.

An increase in systolic BP was accompanied by an increase in MAU (p=0.016) and a decrease in GFR (p=0.008), while an increase in diastolic BP led only to a decrease in GFR (p=0.004). Approximately ¼ 100 mg/dl MAU (p<0.001) and stage 2 CKD were found in patients with hypertensive angiopathy (p=0.048). There was also a positive association between angina pectoris, CHF and clinical signs of peripheral atherosclerosis and albuminuria (p=0.006; p=0.007; p=0.032, respectively).

The majority of patients with MAU were assessed for quality of life by exercise (p=0.015), self-care (p<0.001), and daily activity

(p<0.001) reported some problems, and a positive statistically significant correlation was found between MAU and patients experiencing severe pain or discomfort (p=0.004). 30.4-50.5% of patients with reduced GFR also complained of some self-care problems (p=0.020). Although the majority of patients with MAU and decreased GFR reported a worsening of their condition during the survey compared to the previous year, this correlation was not statistically significant.

In general, GFR<60 ml / min was observed in 7.9% of patients with DM2, MAU was observed in 35.7%, and there were separate and general risk factors for the decrease in GFR and MAU. In our population, the reduction of GFR and MAU can be considered as serious risk factors that play an important role in the formation of CVD. At the same time, there was a cause-and-effect relationship between the occurrence of CVD and the decrease in GFR and MAU in diabetic patients.

Thus, the detection of risk factors, subclinical and clinical damage in target organs in DM2 patients is very important. Without studying and evaluating the existing clinical and epidemiological conditions, it is impossible to adequately provide primary and secondary prevention of CVD in patients with diabetes. We hope that the effective use of the results of our research will make a significant contribution to the successful implementation of state programs to combat non-communicable diseases and DM in Azerbaijan.

ACHIEVED RESULTS

1. Among patients with DM2 living in Azerbaijan, mainly obesity (66.8%), psychosocial (81.4%) and eating disorders (74.8%), patients not working (65.7%), low physical activity (53.6%) prevailed. The incidence of DM (52.8%), obesity (71.8%) and hypertension in the close relatives of patients with diabetes was quite high (29.6%) [3,5,7,8,10,19,20,31,35,51].
2. Carotid plaque (78.9%) is 1.7 times more than the clinical symptoms of cerebrovascular atherosclerosis (46.6%), ABI<0.9 was

found in 27% of patients, sonographically, the main blood flow in the lower extremities predominates (97.4%) and blood circulation was mainly in the subcompensation phase (79.8%). Hypercholesterolemia (78.9%) was 4 times higher than hypertriglyceridemia (19.1%), and hs-CRP was above normal in 60.6% of patients. MAU (37.5%) was twice as common as hypercreatininemia (17.1%), and 56.4% of patients had stage 2-5 CKD [9,11,12,19,34,44,46,50].

3. DM2 in men smoking (39.1%), excessive alcohol intake (39.1%), mild malnutrition (43.5%), overweight (40.4%), physical inactivity (60.2%), the left ventricular ejection fraction <50% (17.4%) was superior to women. In women, moderate (32.2%) and severe malnutrition (6.0%), abdominal obesity (92.9%), hypertension (83.7%), ECG signs of LVH (72.8%) too much was found ($p<0.05$). Hypercholesterolemia (80.8%), non-HDL-C (83.3%), increased hs-CRP (63.5%), hypercreatininemia (18.3%) more in women, hypertriglyceridemia (22.9%), hyperuricemia (7.8%) was detected in men ($p<0.05$). Men reported an improvement (13.7%) and no change (24.2%) compared to the previous year, while women reported a greater deterioration (72.2%) ($p<0.01$) [2,16,20,22,40,47,59].

4. Compared to the capital, smoking (15.9%), alcohol abuse (15.9%), eating disorders (43.1%), clinical anxiety (59.0%) and depression (47.1%), high-grade stress (55.9%), poor glycemic control (89.8%), high incidence of MAU (47.9%) were higher in the regions. Residents of Baku with hypertension (84.4%), those who use combined antihypertensive treatment (47.6%), those who take antihypertensive treatment permanently (59.8%), monotherapy with biguanide (5.3%), combined antidiabetic receiving treatment (46.2%), the incidence of arrhythmias (14.0%), CKD (32.9%), cataracts (42.0%), myocardial remodeling and aortic atherosclerosis (42.6%) was higher than in the regions. In the regions, angiotensin-converting enzyme inhibitors (42.9%), monotherapy with calciun channel blocker (4.1%), antihypertensive treatment when the BP is elevated (45.6%), used as a course (9.6%), sulfonylurea drugs (27.3 %), those receiving monothe-

rapy with insulin (30.4%) were statistically significantly more likely [21,23,32].

5. Although 97.3% of patients received diet and antidiabetic treatment, their glycemic status was not adequately monitored in 81%. Against the background of antihyperglycemic therapy, hypercholesterolemia, hypertriglyceridemia, increased hs-CRP, decreased GFR and various degrees of MAU were found in all patients. The prevalence of hypertension was higher (51.2-67.2%), and this pathology was recorded at the lowest frequency (42.9%) in patients not receiving antihyperglycemic therapy [13,41,43,48,63].

6. Patients do not work (51.3%), grade III (13.9%), abdominal obesity (99.1%), excessive alcohol intake (7.8%), subclinical (34.8%), clinical depression (18.3%) and increased duration of diabetes were predictors of poor glycemic control. In 54.9% of patients with HbA1c≥7%, the target level of BP was not achieved, and the incidence of ECG sign of LVH (74.3%) was quite high. EchoCG symptoms of aortic atherosclerosis were detected in 46.7% of patients with HbA1c≥7%, and antianginal and hypolipidemic treatment was prescribed to only 50% of those with CHD. The incidence of left ventricular diastolic (54.9%) and systolic dysfunction (20.6%) was high during poor glycemic control [14,15,26,36,37,38,54,62].

7. Inadequate glycemic control decreased HDL-C, increased hs-CRP, creatinine, uricemia, ED severity (70.8%), accelerated early menopause (83.3%), MAU (49.1%) , were accompanied by an increase in incidence diabetic retinopathy (35.6%) and diabetic polyneuropathy (45.8%) [29,33,49,55].

8. The prevalence of hypertension on the basis of the survey was 80.3%, adherence to antihypertensive treatment was 81.4%, against the background of antihypertensive treatment 57% of patients did not reach the target level of BP, only 53.9% of patients received antihypertensive treatment without interruption . As the severity of hypertension increased, its prevalence decreased, and the ECG signs of the LVH (69.7%) was determined to be higher than the EchoCG criteria (54.2%). Female sex, age of patients, BMI, duration of

diabetes, abdominal obesity, anxiety, HDL-C, decreased ABI, and albuminuria were determinants of hypertension. The presence of hypertension in both parents (especially the mother) and DM in the mother increased the incidence of hypertension in patients [5,16,28,30,40,42,56,57].

9. According to the survey, 90.2% of patients had different severity of ED. Age, BMI, duration of DM, increased BP, smoking, alcohol abuse, low physical activity and poor glycemic control increased incidence and severity of ED [16,45].

10. GFR<60 ml / min in 7.9% of the cohort, albuminuria was found in 35.7% of cases. The symptoms of CKD were common and separate risk factors. The incidence of albuminuria in working people was low (24.8%), low albuminuria was observed against the background of low and moderate alcohol consumption, and low physical activity increased albuminuria. Systolic BP, duration of BP, TG, creatinine levels, increased uricemia, decreased GFR, and remodeling of the myocardium were associated with albuminuria. An increase non-HDL-C and in clinically significant stenosis in the thigh-knee segment was observed in patients with MAU, and a direct association between EchoCG simptoms of LVH and clinical signs of peripheral atherosclerosis and albuminuria has been identified [1, 24,53].

11. Patients with CKD were more likely to be under high stress, there was a direct correlation between GFR and glycemia, and a decrease in GFR was more common (73.5%) in patients with certain movement problems. The decrease in GFR was accompanied by an increase in diastolic BP, and the incidence of decrease in GFR was high (83.6) in patients with hypertensive angiopathy [27,61].

PRACTICAL RECOMMENDATIONS

1. Large-scale clinical and epidemiological studies should be performed regularly for early screening and correction of risk factors for subclinical and clinical complications in target organs in DM2 patients.

2. DM2 Azerbaijan cohort has its own gender and regional features of risk factors and clinical-epidemiological indicators, which must be taken into account in the prevention and treatment of patients with diabetes, taking into account the severity of the disease and comorbid pathologies for each patient, regardless of education. The principle of individual approach should be chosen.
3. It is recommended to increase efforts in the field of adequate correction and management of CVD and their risk factors in diabetic patients, to improve the principles of team and multifactorial approach of patients of different specialties (endocrinologist, cardiologist, neurologist, vascular surgeon, etc.).
4. For the proper management of diabetes, physicians should follow international recommendations, the widespread use of new groups of antidiabetic drugs and effective antihyperglycemic combinations should be optimized, and the work of diabetes schools should be improved to improve patient self-monitoring and adherence to treatment.
5. In this group of patients, in addition to adequate correction of hyperglycemia, the use of antihypertensive, hypolipidemic and antiplatelet drugs in the correct and optimal doses, neutralization and correction of modified predicates should be carried out to reduce the incidence of CVD in this group of patients.
6. There is a serious need for early, regular screening and monitoring of risk factors for ED and CKD in the diabetic cohort for the prevention of CVD, and for the detection and adequate management of DM2, hypertension and MAU in more regions.
7. In order to ensure proper control of glycemic status, measures should be further strengthened to improve the knowledge and skills of physicians, especially in primary health care facilities.

LIST OF PUBLISHED SCIENTIFIC WORKS ON THE SUBJECT OF THE DISSERTATION

1. Mehdiyev, S.X. 2-ci tip şəkərli diabet və albuminuriya // – Bakı: Azərbaycan tibb jurnalı, - 2013. N4, - s. 146-150.
2. Mehdiyev, S.X., Mustafayev, İ.İ. 2-ci tip şəkərli diabetli xəstələrdə ürək-damar ağırlaşmaları riskinin yaş və cins xüsusiyyətləri // - Bakı: Azərbaycan Tibb Jurnalı, - 2015, N4 (xüsusi buraxılış), - s. 57-63.
3. Мехдиев, С.Х. Взаимосвязь уровня образования с кардиоваскулярными осложнениями у больных сахарным диабетом типа 2 // - Bakı: Биомедицина, - 2015, N4, - с. 45-48.
4. Mehdiyev, S.X., Mustafayev, İ.İ., Məmmədov, M.N. 2-ci tip şəkərli diabetli xəstələrdə hipoqlikemik müalicə sxemləri fonunda ürək-damar xəstəliklərinin yayılmasının xüsusiyyətləri // - Bakı: Azərbaycan kardiologiya jurnalı, - 2016, 2(10), s. 21-27.
5. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Деев, А.Д. Клинико-эпидемиологические особенности артериальной гипертензии у больных сахарным диабетом типа 2 // - Москва: Кардиология, - 2016, N11, - с. 43-49. doi.org/10.18565/cardio.2016.11.43-49.
6. Michel, K. Physicians adherence to guideline-recommended medications in heart failure with reduced ejection fraction:data from the QUALIFY global survey / Stefan D. Anker, Martin R. Cowie, Gerasimos S. Filippatos [et al.] // European Journal of Heart Failure, - 2016, 18(5), - pp. 514-22. doi:10.1002/ejhf.510.
7. Mehdiyev, S.X., Mustafayev, İ.İ., Məmmədov, M.N. 2-ci tip şəkərli diabet və ürək-damar xəstəliklərinin klinik-epidemioloji tədqiqatının nəticələri // - Bakı: Azərbaycan təbabətinin müasir nailiyyətləri, - 2017, N1, - s. 59-65.
8. Mehdiyev, S.X., Mustafayev, İ.İ., Məmmədov, M.N. 2-ci tip şəkərli diabetli xəstələrdə risk faktorları və subklinik orqan

zədələnmələrinin xüsusiyyətləri // - Bakı: Azərbaycan metabolizm jurnalı, - 2017, 1(14), - s. 10-17.
9. Mehdiyev, S.X. 2-ci tip şəkərli diabetli xəstələrdə beyin və aşağı ətraf qan dövranı pozulmalarının xüsusiyyətləri // – Bakı: Azərbaycan təbabətinin müasir nailiyyətləri, - 2017. N2, - s. 121-126.
10. Mehdiyev, S.X., Mustafayev, İ.İ., Məmmədov, M.N. 2-ci tip şəkərli diabetli xəstələrdə əsas risk faktorları, irsi meyllik və həyat keyfiyyətinin xüsusiyyətləri // - Bakı: Sağlamlıq, - 2017. N2, - s. 94-100.
11. Mehdiyev, S.X., Mustafayev, İ.İ., Məmmədov, M.N. 2-ci tip şəkərli diabet və periferik qan dövranı pozulmaları: kliniki-epidemioloji tədqiqatın nəticələri // - Bakı: Əziz Əliyev adına elmi-praktik jurnal "Tibb və Elm", - 2017, - 2(8), - s. 37-42.
12. Mehdiyev, S.X. 2-ci tip şəkərli diabetli xəstələrdə laborator göstəricilər və ürək-damar riskinin qiymətləndirilməsi // – Bakı: Azərbaycan təbabətinin müasir nailiyyətləri, - 2017. N3, - s. 109-114.
13. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Оценка эффективности лечения пациентов с сахарным диабетом 2-го типа при использовании различных схем терапии // Казань: Казанский медицинский журнал, - 2017, - 4(98), - с. 564-571.
14. Мехдиев, С.Х. Показатели гликемического статуса и кардиоваскулярных осложнений в зависимости от уровня образования у больных сахарным диабетом типа 2 // - Москва: Международный журнал сердца и сосудистых заболеваний, - 2017, 5(15), - с. 34-39.
15. Mehdiyev, S.Kh. Characteristics of glycaemic status and cardiovascular complications in relation to education level in patients with diabetes mellitus type 2 // - Moscow: International heart and vascular disease journal, - 2017. 5(15), - p. 26-30.
16. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Выявление эректильной дисфункции и ее связи с факторами риска

сердечно-сосудистых заболеваний у больных сахарным диабетом типа 2 // - Москва: Кардиоваскулярная терапия и профилактика, - 2017, 16(2), - с. 65-70. http://dx.doi.org/10.15829/1728-8800-2017-2-65-70.
17. Michel, K. Physicians guideline adherence is associated with better prognosis in outpatients with heart failure with reduced ejection fraction: the QUALIFY international registry / Martin Cowie, Luigi Tavazzi, Piotr Ponikowski [et al.] // European Journal of Heart Failure, - 2017, 19, - pp. 1414-1423. doi:10.1002/ejhf.887.
18. Mehdiyev, S.X. Azərbaycan populyasiyasında qlikemik statusla antidiabetik müalicə üsulları, mikrodamar ağırlaşmaları və laborator göstıricilər arasında assosiasiya // – Bakı: Azərbaycan kardiologiya jurnalı, - 2018. 1 (13), - s. 51-60.
19. Мамедов, М.Н., Мехдиев, С.Х., Деев, А.Д. Приоритеты первичной профилактики сердечно-сосудистых заболеваний: результаты многоцентрового международного когортного исследования AHS I (Azerbaijan Heart Study, part I) // - Москва: Международный журнал сердца и сосудистых заболеваний, - 2018, 6(18), - с. 4-14. doi: 10.15829/2311-1623-6-18.
20. Mehdiyev, S.X. Şəkərli diabet tip 2 xəstələrdə risk faktorlarının cins xüsusiyyətləri // – Bakı: Əziz Əliyev adına elmi-praktik jurnal "Tibb və Elm", - 2019, 2 (16), - s. 59-66.
21. Mehdiyev, S.X. Şəkərli diabet tip 2 xəstələrdə ənənəvi risk faktorları, həyat keyfiyyəti və laborator göstəricilərin bölgə xüsusiyyətləri // – Bakı: Azərbaycan metabolizm jurnalı, - 2019. N3, - s. 17-25.
22. Mehdiyev, S.X. Şəkərli diabet tip 2 xəstələrində laborator və həyat keyfiyyəti göstəricilərinin cins xüsusiyyətləri // – Bakı: Əziz Əliyev adına elmi-praktik jurnal "Tibb və Elm", - 2019, 3 (17), - s. 67-73.
23. Mehdiyev, S.X. 2-ci tip şəkərli diabeti olan xəstələrdə hədəf orqan zədələnmələri və müalicə taktikalarının regional

xüsusiyyətləri // – Bakı: Azərbaycan Tibb Jurnalı, - 2019. N4, - s. 83-89.
24. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Взаимосвязь хронической болезни почек с гликемическим статусом, сердечно-сосудистыми заболеваниями и лабораторными показателями у пациентов с сахарным диабетом 2 типа // - Москва: Кардиоваскулярная терапия и профилактика, - 2019, 18(3), - с. 48-56. http://dx.doi.org/10.15829/1728-8800-2019-3-48-56.
25. Michel, K. Physicians' guideline adherence is associated with long-term heart failure mortality in outpatients with heart failure with reduced ejection fraction: the QUALIFY international registry / Jakob Schöpe, Stefan Wagenpfeil, Luigi Tavazzi [et al.] // European Journal of Heart Failure, - 2019, 21(7), - pp. 921-929. doi:10.1002/ejhf.1459.
26. Мехдиев, С.Х., Мустафаев, И.И., Кафаров, И.А., Марданов, Б.У., Мамедов, М.Н. Взаимосвязь гликемического статуса, артериальной гипертензии и макрососудистых осложнений: результаты многоцентрового когортного исследования // Профилактическая медицина, - 2019, 22(6), - pp. 103-111. doi.org/10.17116//profmed201922061103.
27. Мехдиев, С.Х. Взаимосвязь хронической болезни почек с сердечно-сосудистыми факторами риска у пациентов с сахарным диабетом 2 типа // - Москва: Международный журнал сердца и сосудистых заболеваний, 2019, 23(7), - с. 18-27. DOI: 10.15829/2311-1623-7-23.
28. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Предикторы артериальной гипертензии в азербайджанской популяции у больных сахарным диабетом 2 типа // Москва: Российский кардиологический журнал, - 2019, - 24(1), - с. 23–31. http://dx.doi.org/10.15829/1560-4071-2019-1-23-31.
29. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Особенности гликемического статуса и факторы риска у больных ишемической болезнью сердца и сахарным диабетом 2 типа в азербайджанской популяции // Москва:

Российский кардиологический журнал, - 2019, 24(6), - с. 85-91. http://dx.doi.org/10.15829/1560-4071-2019-6-85-91.
30. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Особенности факторов риска развития сердечно-сосудистых заболеваний, поражений органов- мишеней у больных сахарным диабетом 2-го типа и артериальной гипертензией // Москва: Кардиология, - 2019, 59(9), - с. 20-28. https://doi.org/10.18087/cardio.2019.9.10271.
31. Mehdiyev, S.Kh., Mamedov, M.N., Pranas, S., Podpalov, V.P., Olimzoda, N.K., Kamilova, U.K., Istrati, V., Annaev, B.K. Comorbidity conception of somatic diseases in cardiology practice // Interdisciplinary approaches to medicine, - 2020, vol. 1, N 2, - p. 19-25. doi.org/10.26577/IAM.2020.v1.i2.03.
32. Mehdiyev, S.X. Şəkərli diabet tip 2 kohortada risk faktorlari və həyat keyfiyyəti gostəricilərinin skrininqinin nəticələri // - Bakı: Əziz Əliyev adına elmi-praktik jurnal "Tibb və Elm", - 2021, 2 (24), - s. 70-76.
33. Мехдиев, С.Х. Характеристика изменений гликемического профиля у больных с сахарным диабетом 2 типа / И.И. Мустафаев, Т.В. Мехтиев, А.М. Мамедова [и др.] // Труды Московского международного форума кардиологов, - Москва: - 14-15 июня, - 2012, - с. 76.
34. Мехдиев, С.Х., Аббасов, В.Г., Мамедов, М.Н. Особенности сердечно-сосудистых факторов риска и их лечения у больных с сахарным диабетом 2 типа в Азербайджане // Труды Московского международного форума кардиологов, - Москва: - 14-15 июня, - 2012, - с. 77.
35. Мехдиев, С.Х., Мамедов, М.Н., Мустафаев, И.И., Аббасов В.Г. Определение стресса, тревоги, депрессии и нарушений эректильной функции у больных сахарным диабетом 2 типа в Азербайджанской популяции // - Москва: Кардиоваскулярная терапия и профилактика, специальный выпуск, - 2013, 12 (март), - с. 118-119.
36. Мехдиев, С.Х., Мамедов, М.Н., Мустафаев, И.И. Изучение взаимосвязи показателей наследственной предрасполо-

женности и гликемии у больных сахарным диабетом 2 типа // Труды III международного форума кардиологов и терапевтов, - Москва: - 24-26 марта, - 2014, - с. 74-75.
37. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Взаимосвязь гликемического статуса с уровнем образования больных с сахарным диабетом 2 типа // Труды IV международного форума кардиологов и терапевтов, - Москва: - 30 марта - 1 апреля, - 2015, с. - 138-139.
38. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Влияние пола, возраста и занятости на гликемический профиль больных сахарным диабетом 2 типа // Труды IV международного форума кардиологов и терапевтов, - Москва: - 30 марта - 1 апреля, - 2015, - с. 139.
39. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Гасанлы, Л.Ф. Состояние гликемического контроля у больных сахарным диабетом 2 типа в Азербайджанской популяции // Труды межрегиональной научно-образовательной конференции кардиологов и терапевтов, - Саратов: - 10 - 11 ноября, - 2015, - с. 75.
40. Mehdiyev, S.X., Mustafayev, İ.İ. 2-ci tip şəkərli diabetli xəstələrdə arterial hipertenziyanın cinsdən asılı xüsusiyyətləri // - Bakı: Azərbaycan metabolizm jurnalı, - 2016, 3(13), - s. 41.
41. Mehdiyev, S.X., Mustafayev, İ.İ., Məmmədov, M.N. 2-ci tip şəkərli diabetli xəstələrdə hipoqlikemik müalicə üsullarinin səmərəlilik və adekvatliğinin qiymətləndirilməsi // - Bakı: Azərbaycan metabolizm jurnalı, - 2016, 4(13), - s. 29-30.
42. Мехдиев, С.Х., Мустафаев, И.И., Касумова, Ф.Н., Мамедов. М.Н. Особенности распространения артериальной гипертензии у больных сахарным диабетом типа 2 // Труды VI научно-образовательной конференции кардиологов и терапевтов Кавказа, - Грозный: - 25-26 октября, - 2016, - с. 100.
43. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Касумова, Ф.Н. Особенности тактики антидиабетической терапии у больных сахарным диабетом типа 2 // Труды II

межрегиональной конференции кардиологов и терапевтов, - Ульяновск: - 5-6 декабря, - 2016, - с. 105-106.
44. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Касумова, Ф.Н. Особенности лабораторных показателей у больных сахарным диабетом 2 типа // Труды VI международного форума кардиологов и терапевтов, - Москва: - 28-30 марта, - 2017, - с. 195-196.
45. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Касумова, Ф.Н. Взаимосвязь эректильной дисфункции с факторами риска у больных сахарным диабетом типа 2 в азербайджанской популяции // Труды VII научно-образовательной конференции кардиологов и терапевтов Кавказа, - Махачкала: - 18-19 октября, - 2017, - с. 60.
46. Мехдиев, С.Х. Состояние периферического кровотока по данным клинико-эпидемиологического исследования у лиц с сахарным диабетом типа 2 / И.И. Мустафаев, М.Н. Мамедов, Ф.Н. Касумова [и др.] // Труды III межрегиональной конференции кардиологов и терапевтов, - Саранск: - 28-29 ноября, - 2017, - с. 68-69.
47. Aliyev, R., Mehdiyev, S., Mustafayev, I., Mammadov, M. Age and gender characteristics of the cerebrovascular diseases among patients with type 2 diabetes mellitus // The 11th World Congress on Controversies in Neurology (CONy), - Athens, Greece, - 2017. - p. 107.
48. Мехдиев, С.Х. Антидиабетическая терапия и распространенность сердечно-сосудистых заболеваний / И.И. Мустафаев, М.Н. Мамедов, Ф.Н. Касумова [и др.] // Труды VII международного форума кардиологов и терапевтов, - Москва: - 21-23 марта, - 2018, - с. 197-198.
49. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н. Состояние компенсации углеводного обмена и его факторы риска у больных сахарным диабетом типа 2 // Труды VIII научно-образовательной конференции кардиологов и терапевтов Кавказа с международным участием, - Ставрополь: - 18-19 октября, - 2018, - с. 70.

50. Mehdiyev, S.Kh., Mustafayev, I.I., Gasimova, F.N., Mamedov, M.N. Assessment of cardiovascular risks in patients with diabetes mellitus type 2 // Journal of the American College of Cardiology, - 2018, 72(16), suppl. c, - pp. 223-224.
51. Мехдиев, С.Х. Роль наследственной предрасположенности в формировании артериальной гипертензии у больных сахарным диабетом 2 типа / И.И. Мустафаев, М.Н. Мамедов, Н.Р. Исмаилова [и др.] // Труды VIII Международного форума кардиологов и терапевтов, - Москва: - 27-29 марта, - 2019, - с. 104.
52. Мехтиев, Т.В. Артериальная гипертензия и сахарный диабет 2 типа: ведение больных с коморбидным состоянием / С.Х. Мехдиев, М.Н. Мамедов, Э.А. Каримов [и др.] // Труды VIII Международного форума кардиологов и терапевтов, - Москва: - 27-29 марта, - 2019, - с. 105-107.
53. Mehdiyev, S.Kh. Features of arterial hypertension in patients with type 2 diabetes mellitus in the Azerbaijani population, depending on the functional state of the kidneys // Cardiovascular innovations and applications, - 2019, vol. 4, suppl. 1, - p. 128.
54. Мехдиев, С.Х., Мустафаев, И.И., Касумова, Ф.Н., Мамедов, М.Н. Особенности артериальной гипертензии у больных сахарным диабетом 2 типа в зависимости от уровня контроля гликемии // Труды IX международного форума кардиологов и терапевтов, - Москва: - 25-27 марта, - 2020, - с. 164-165.
55. Mehdiyev, S.X. Şəkərli diabet tip 2 xəstələrdə qlikemiyaya nəzarətlə risk faktorları və hədəf orqan zədələnmələri arasındakı assosiasiya // - Bakı: Azərbaycan metabolizm jurnalı, - 2020, 4(17), - s. 38-39.
56. Mehdiyev, S.Kh., Mustafayev, I.I., Mamedov, M.N. The role of psychological risk factors in type 2 diabetic patients in the development of hypertension in the population of Azerbaijan // Cardiovascular innovations and applications, - 2020, vol. 5, suppl. 1, - p. 126.

57. Мехдиев, С.Х., Мустафаев, И.И., Касумова, Ф.Н., Мамедов, М.Н. Изучение роли психологических факторов риска у больных сахарным диабетом 2 типа в зависимости от уровня артериального давления // Российский национальный конгресс кардиологов, - Казань: - 2020, - с. 205.
58. Mehdiyev, S.Kh., Mustafayev, I.I., Mamedov, M.N., Gasimova, F.N. The prevalence of hypertension in patients with type 2 diabetes mellitus in the population of Azerbaijan // Cardiovascular innovations and applications, - 2021, vol. 6, suppl. 1, - p. 134.
59. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Касумова, Ф.Н., Марданов, Б.У. Клинико-эпидемиологические особенности качества жизни азербайджанской популяции больных сахарным диабетом 2 типа // Международный журнал сердца и сосудистых заболеваний, - Москва: - 2021, 8 (28), - стр. 43-45. Приложение 1. doi: 10.15829/2311-1623-8-28.
60. Мехдиев, С.Х., Мустафаев, И.И., Мамедов, М.Н., Касумова, Ф.Н., Мехдиев, Т.В. Артериальная гипертензия у больных сахарным диабетом 2 типа в азербайджанской популяции (результаты многоцентрового клинико-эпидемиологического исследования) // Приложение к Международному журналу сердца и сосудистых заболеваний, - Москва: - 2021, 9 (29), - стр. 54-55. DOI: 10.15829/2311-1623-9-29.
61. Мехдиев, С.Х., Мустафаев, И.И., Касумова, Ф.Н., Мамедов, М.Н. Взаимосвязь хронической болезни почек с основными факторами риска сердечно-сосудистых заболеваний и другими показателями в азербайджанской популяции больных сахарным диабетом 2 типа // Российский национальный конгресс кардиологов, - Санкт-Петербург: - 2021, - с. 122.
62. Mehdiyev, S.Kh., Mustafayev, I.I., Mamedov, M.N. Features of hypertension in patients with type 2 diabetes mellitus depending on the level of glycemic control // Metabolism

clinical and experimental, - 2021, - vol. 116, suppl., 154603. DOI:https://doi.org/10.1016/j.metabol.2020.154603.
63. Mehdiyev, S.X. 2-ci tip şəkərli diabet və mikro-makro angiopatiyalar: ixtisaslaşmış tibbi yardımın alqoritmləri // – Bakı: Dərs vəsaiti, - 2015. - 165 s.

LIST OF ABBREVIATIONS AND TERMS

ABİ - ankle-brachial index
BP - blood pressure
BMİ - body mass index
CHD - coronary heart disease
CHF - chronic heart failure
Cİ - confidense interval
CKD - chronic kidney disease
CVD - cardiovascular disease
DM - diabetes mellitus
DM2 - type 2 diabetes mellitus
ECG - electrocardiographic
EchoCG - echocardiographic
ED - erectile dysfunction
GFR - glomerular filtration rate
HbA1c - glycohemoglobin
HDL-C - high density lipoprotein cholesterol
hs-CRP - high sensitivity C reactive protein
IDF - Internasional Diabetes Federasion
İMT - intimate-media thickness
LVH - left ventricular hypertrophy
MAU - microalbuminuria
Mİ - myocardial infarctıon
SU - sulfonylurea
TG - triglyceride

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