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Master's thesis

**MODERN UNDERSTANDING OF THE MANAGEMENT OF PATIENTS
WITH DIABETES MELLITUS**

223 - Nursing

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ABSTRACT

About 422 million people worldwide have diabetes, most of whom live in low- and middle-income countries, and 1.5 million deaths are directly related to diabetes each year [2, 3, 44].

Purpose of the study: to study with the help of scientific research modern ideas about the management of patients with childhood, adolescence, middle and elderly age with diabetes mellitus, to study the features of the stationary diabetes mellitus, as well as to explore the features of the work of a nurse for the prevention and care of patients with diabetes.

Research Assignments.

1. To study the disease of the endocrine system - diabetes mellitus, its classification, diagnosis, features of the clinical picture and treatment.
2. To investigate the features of the occurrence and course of diabetes mellitus in childhood and adolescence.
3. Determine the features of diabetes mellitus in adults and the elderly.
4. Investigate the features of diabetes mellitus in pregnant women.
5. To study the features of the work of a nurse for the effective prevention and management of diabetes mellitus of the 1st and 2nd type.

Object of research. The patients of childhood, adolescence, middle and elderly age, patients with diabetes mellitus, women with gestational diabetes.

Subject of research. One of the diseases of the endocrine system is diabetes mellitus; classification, diagnosis, clinical manifestations of this disease and its features in childhood, adolescence, middle age and old age, as well as the organization of the nurse's work on the prevention and care of patients with diabetes mellitus.

Research methods: general clinical methods of studying patients used in endocrinology for various age categories of patients with diabetes mellitus (laboratory and instrumental research methods), as well as analytical methods and statistical methods.

Scientific and practical significance of the study. With the help of this scientific study, the disease of the endocrine system was studied - diabetes mellitus, its classification, diagnosis, features of the clinical picture and treatment; the features of the occurrence of the occurrence were investigated. and the course of diabetes in childhood and adolescence; the features of diabetes mellitus in adults and the elderly have been determined; the features of diabetes mellitus in pregnant women were investigated; the features of the work are studied медсестры для effective prevention and management of diabetes mellitus type 1 and 2.

Conclusions:

1. The disease of the endocrine system - diabetes mellitus, features of its classification, diagnosis, clinical picture and treatment - has been studied.
2. The features of the occurrence and course of diabetes mellitus in childhood and adolescence are investigated.
3. The features of diabetes mellitus in adults and the elderly have been determined.
4. The features of diabetes mellitus in pregnant women have been investigated.
5. The features of the nurse's work for the effective prevention and management of diabetes mellitus of the 1st and 2nd type are studied.

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INTRODUCTION

About 422 million people worldwide have diabetes, most of whom live in low- and middle-income countries, and 1.5 million deaths are directly related to diabetes each year [2, 3, 44]. Both the number of cases and the prevalence of diabetes have increased steadily over the past few decades. WHO experts say that 8.5% of the world's adult population suffers from diabetes, Approximately 1.5 million people die from diabetes each year, 43% of those who die from diabetes and related diseases did not live to be 70 years old [44].

Many endocrinologists claim that diabetes mellitus is a silent disease, but it comes mercilessly to all countries of the world, and this needs to be stopped [2,3].

"We can stop it, we know what needs to be done. This disease cannot be allowed to develop as it is now, because it has a huge negative impact on people's health, on families and on society as a whole," said expert Etienne Krug, WHO's lead diabetes specialist [44].

Failure to regulate sugar levels in diabetes mellitus 1st [4, 21, 23, 26, 34, 46] or type 2 [5, 16, 17, 20, 31, 39] in the blood leads to devastating consequences [22], increasing the risk of heartattack [5, 27],stroke, kidney failure [9], visionloss [28, 40],amputation of limbs [35, 36, 37],and can also leadto complications during childbirth [2,3].

Diabetes mellitus ranks eighth in the list of diseases from which the most people die in the world [44].

Historically, earlier, in the 1980s, the highest incidence of diabetes was observed in rich countries. Since then, there has been a striking transformation, and to date. the brunt of the burden has fallen on low- and middle-income countries. According to WHO experts, population growth and aging is only part of the problem[44].The main cause of the disease is the wrong diet [17, 24, 43] and a sedentary lifestyle [32],for example, data indicate that more than 75% of adolescents do not exercise in the recommended amount [32].

WHO experts believe that in order to solve the problem, society as a whole must throw its forces into the fight against diabetes [44]. "The easy way out is if we all start exercising, eating healthy and watching our weight. But this is certainly not such an easy way to solve the problem," says the leading WHO specialist in the fight against diabetes, expert Etienne Krug. He calls on governments to start regulating the fat and sugar content of foods so that, as he says, people always have the opportunity to make healthier choices.

WHO experts are also appealing to the food industry to take a more responsible approach to their products, reducing the fat and sugar content, as well as stopping advertising junk food to adolescents [8, 14,17, 24, 44].

Another solution could be more thoughtful urban planning, which would give citizens an incentive to cycle and walk.

A very important point is the control of blood sugar [2, 3] of children [25, 46], young [4, 11, 12, 47], adults and the elderly [1]. This may contribute to the fact that complications [5, 9, 15, 20, 27] that occur in diabetes, do not develop further. However, according to the WHO report, two-thirds of low-income countries are unable to provide most patients with either glucometers or medications, such as insulin or metformin [44].

To date, most diabetics from low-income countries who need medicines and access to technology do not have this opportunity.

Therefore, nursing support [13, 15, 29, 30, 31, 38, 41] of the management of patients with diabetes mellitus of the 1st [4, 23, 46] and 2nd [5, 20, 39] types, knowledge of the features of diagnosis [2, 3] and treatment [10] and care [30], as well as the prevention of this serious disease [18], timely prevention of development is complicated [9, 28, 37, 40] is an important link in solving this problem and requires scientific research.

Purpose of the study: to study with the help of scientific research modern ideas about the management of patients with childhood, adolescence, middle and elderly age with diabetes mellitus, to study the features of the stationary

diabetes mellitus, as well as to explore the features of the work of a nurse for the prevention and care of patients with diabetes.

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studied медсестры для effective prevention and management of diabetes mellitus type 1 and 2.

CHAPTER 1
DIABETES MELLITUS: CLASSIFICATION, DIAGNOSIS, CLINIC
AND TREATMENT
(LITERATURE REVIEW)

In most countries of the world, patients with diabetes mellitus (DM) make up 2-6% of the general population [2, 3, 44], and among the elderly and senile [1] and persons with risk factors (obesity, hypodynamia [32], etc.), this number increases to 30%. The prevalence of diabetes in pregnant women ranges from 1 to 5%.

The prevalence of diabetes in individual countries varies: in Japan, China - 0.7 - 0.9%, in Western Europe 3-8%, among some Indian tribes of the UNITED STATES 15-20%. The economic effect of this disease is important, since the costs of treating patients are significant. So in the United States, economic losses from diabetes mellitus amounted to 102 billion dollars (direct costs for treatment - 45 billion dollars, and indirect, as a result of disability, etc. - 47 billion dollars). Diabetes mellitus is the main cause of blindness [28, 40], 50% of all amputations (without injuries) [35, 37]. Patients with diabetes mellitus are 2-3 times more likely to be diagnosed with coronary heart disease (CHD), and mortality from coronary artery disease is 2-5 times higher compared to the population [5, 27]. In the world there is a constant increase in the number of patients with diabetes mellitus, which for 10 years increases by 1.5 - 2 times [44].

The reasons for the growth of diabetes can be explained by the following factors:

1. The number of genetic disorders in the population is growing. In the etiopathogenesis of diabetes mellitus, the genetic (hereditary) factor is of great importance;
1. In developed countries, the increase in the number of patients with diabetes mellitus is due to an increase in the life expectancy of the population;

1. The number of overweight and obese people in the population is increasing significantly;
2. The incidence of atherosclerosis increases;
3. Diagnosis and early detection of diabetes mellitus are improving.

Clinical classification of diabetes mellitus [2, 3].

I. Clinical forms:

1. Primary: essential, genetic (with or without obesity)
2. Secondary (symptomatic): pituitary, steroidal, thyrogenic, adrenal, pancreatic (inflammation, tumors or removal of the pancreas). bronze (with hemochromatosis).

3. Diabetes of pregnant women (gestational).

4. Impaired tolerance to carbohydrates (latent).

5. Risk factors (prediabetes).

II. Types of diabetes:

1. Type I - insulin-dependent

2. TYPE II - insulin-independent

III. Severity: mild, moderate, severe.

IV. Compensation status: compensated, subcompensated, decompensated.

B. The presence of angiopathies (stage I - II - III) and neuropathies:

1. Microangiopathy - retinopathy, nephropathy, angiopathy (capillaropathy) of the lower extremities or other localization.

2. Macroangiopathy - damage to the vessels of the heart, brain, lower extremities or other localization.

3. Universal micro-, macroangiopathy.

4. Neuropathy (peripheral, autonomous, visceral, encephalopathy).

V. Damage to other organs and systems: hepatopathy, dermopathy, enteropathy, cataracts, osteoarthropathy and others.

VI. Acute complications of diabetes:

1. Ketonemic (ketoacidotic) coma [23]

2. Hyperosmolar coma

3. Hyperlactic acidemic coma

4. Hypoglycemic coma.

Diagnosis of diabetes mellitus [21, 44]

1. Determination of fasting glycemia and its repeated determinations during the day is the main (key) method for diagnosing diabetes.

The diagnosis of T1DM can be made if:

1. With a two-time determination of fasting glycemia more than 6.1 mmol / l (110 mg%);
2. With an arbitrary determination among the day, glycemia over 11.0 mmol / l
3. In addition to this is the determination of glucosuria per day or fractionally in separate portions.

Indications for a standard glucose tolerance test [21]:

1. Temporary disorders of carbohydrate metabolism:

- glucosuria of pregnant women
- hyperglycemia after eating up to 9.9 mmol / l;
- reactive hypoglycemia.

2. The presence of risk factors for diabetes:

- hereditary predisposition;
- overweight;
- pathological pregnancy and childbirth: miscarriages, polyhydramnios, stillbirth, toxicosis of pregnant women, the mass of newborns is more than 4 kg;
- peripheral vascular lesions, arterial hypertension;
- chronic infection;
- Dermopathy, retinopathy and neuropathy of an unexplained cause;
- hyperlipidemia, hyperuricemia.

Conditions for a standard glucose tolerance test [21]:

1. The test is not performed for various intercurrent diseases, liver and kidney damage.

2. The subject for three days before the test is on a normal diet (at least 150 g of carbohydrates) and performs the usual physical work.

3. At least 3 days before the test, drugs that affect the test results (corticosteroids, estrogens, saluretics, salicylates), as well as hypoglycemic drugs, should be canceled.

4. The test is carried out after a night fast for 10 - 14 hours. Drinking water is allowed.

5. A blood sample for fasting sugar is taken from the subject, after which he takes 75 g of glucose dissolved in 250 - 500 ml of water for 5 - 10 minutes. According to the recommendations of the WHO Expert Committee on BD, the main diagnostic criterion for interpreting an oral glucose tolerance test is the fasting glucose level and 2 hours after exercise.

Determination of the level of glycosylated hemoglobin (HbA1c)

In healthy people, the amount of HbA1c is 4-6% of the total amount of hemoglobin. In patients with diabetes, its amount increases significantly depending on the level of hyperglycemia. Allows you to identify the early stages of T1D (preclinical), since it is possible to diagnose hyperglycemia during the last month. The level of HbA1c > 6.5% roughly corresponds to fasting glycemia > 6.1 mmol / l, and more than 7.5% - glycemia > 7.0 mmol / l.

Diabetes Clinic [6, 7, 11, 12]

In its development, diabetes usually goes through 3 stages, which are more clearly distinguished in patients with type 2 diabetes [5, 16, 17, 20, 31, 39].

1. Prediabetes - a condition (the period of the patient's life) preceding the disease. Laboratory indicators do not go beyond the norm. Patients often have risk factors for diabetes:

- the presence of T1D in relatives (in the presence of T1D in both relatives, the risk of developing it in children increases to 50%)
- obesity (the risk increases with increasing degree of obesity)
- hyper- and dyslipoproteinemia
- the birth of a child with a large (more than 4 kg) body weight - both for the child and for the mother (the risk increases with increasing mass)

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- in women, glycosuria during pregnancy; miscarriages and stillbirths
- viral diseases
- acute and chronic stress
- atherosclerosis, hypertension
- acute and chronic intoxication
- acute and chronic diseases of the liver and pancreas
- iatrogenic factors (thiazide diuretics, glucocorticoids, etc.)

2. Impaired glucose tolerance (latent diabetes) - a condition in which there is no diabetes clinic, on an empty stomach normoglycemia and aglucosuria. Violation is detected during STSH. In patients during this period, the so-called "small symptoms" of diabetes may appear:

- chronic gingivitis, stomatitis, periodontal disease, tooth loss
- chronic pustular skin diseases, furunculosis
- itching of the skin, genitals
- violation of skin trophism, skin injuries, long-term non-healing
- unmotivated sexual weakness, menstrual irregularities
- polyneuritis
- cataracts

3. Obvious (manifest) diabetes mellitus is a condition when clinical symptoms become manifest, changes in laboratory parameters, primarily hyperglycemia and glycosuria. Clinical symptoms of diabetes, primarily complaints of patients caused by the disease itself, the degree of its compensation and complications [9, 27, 28, 40].

Patients are observed:

- polydipsia, thirst, dry mouth;
- polyuria, frequent urination, which leads to dehydration;
- muscle weakness, increased fatigue;
- weight loss (type 1 type 1), weight gain (type 2 type 2);

- loss of appetite (polyphagia is possible at first)
- leg pain, paresthesia, loss of sensation [15, 33, 35];
- itching (local - perineum, scalp or generalized);
- visual impairment, impaired sexual function;
- chronic pustular or fungal skin lesions.

Depending on the clinic and laboratory parameters, 3 degrees of severity of heart attack are distinguished: mild, moderate and severe [2,3].

Criteria for the severity of diabetes mellitus.

According to the degree of compensation of metabolic processes, diabetes can be compensated, subcompensated and decompensated.

Compensation is understood as a satisfactory general condition of the patient, preserved working capacity, absence of complications, normoglycemia, agglucosuria and normal biochemical parameters, achieved under the influence of treatment.

Diabetes is considered subcompensated when the patient's condition is satisfactory, but the working capacity is reduced, the complications are not expressive, against the background of treatment, glycemia 8-10 mmol / l, glucosuria 20-30 g / l, metabolic disorders are insignificant, ketoacidosis is absent.

Decompensated diabetes - an expressive clinic of the disease, the patient's condition is moderate or severe, expressive complications, high hyperglycemia and glycosuria, a significant metabolic disorder, ketoacidosis, ketonuria [23]. Patients are incapacitated for work.

The main goal of treatment [10, 27, 39] of diabetes is to compensate for metabolism, restore working capacity, follow all complications of the disease, social adaptation and education of diabetic patients.

Treatment of type II diabetes should be started at the stage of prediabetes [27, 39], in the presence of risk factors, excited fasting glycemia, especially impaired glucose tolerance [21]. Recommendations of this stage have a preventive direction and are aimed at changing lifestyle, diet. Usually, with the

first detection of type 2 diabetes, metabolic disorders are moderately expressed [32], and therefore the first therapeutic measure in such patients is the appointment of an appropriate diet [17, 24, 43]. Only in case of its ineffectiveness, it is advisable to prescribe tableted hypoglycemic mediums, which avoids unreasonable prescription, since hyperinsulinemia is stimulated, which affects patients with type 2 diabetes [20, 31, 39]. The latter, in turn, contributes to the development of macroangiopathy and, as a result, increases the incidence of myocardial infarction [5, 27] or stroke in this category of patients.

In the treatment of diabetes mellitus, self-education of patients is in the first place [13, 15, 29]. If the patient does not know anything about his illness, then it is impossible to achieve any results. The patient must consciously relate to his lifestyle [8, 14], nutrition [17, 24, 43], treatment [10]. It is necessary to teach a patient with diabetes mellitus to independently control their glycemia, to know the signs of ketoacidosis [23] and a hypoglycemic state, to prevent and eliminate conditions if necessary.

The main cause of violation of carbohydrate metabolism in type 2 diabetes is overweight. In numerous studies, it has long been proven that in most patients, weight loss can achieve a stable compensation for carbohydrate metabolism, reduce insulin resistance, and also get a positive effect against concomitant arterial hypertension and dyslipidemia. And sometimes even a very moderate weight loss can give a good effect. It is possible to achieve its reduction only by limiting the caloric content of the diet [17, 24, 43]. The question of what to give preference to: a gradual decrease in body weight based on hypocaloric (1500-1800 kcal / day) mixed nutrition (with a physiological ratio of basic nutrients: 50% of the total caloric content should be carbohydrates, 35% - fats, 15% - proteins) or intensive, which is achieved for a short period of a very low-calorie diet (400-800 kcal / day), it is decided in favor of the first approach. It is more physiological, can actually be a modification of nutrition [17, 24, 43], to which the patient is accustomed, and also contributes to the simultaneous use of any hypoglycemic therapy [10] if it is necessary.

Diet therapy is a powerful therapeutic factor and is even able to sometimes continue to compensate for diabetes mellitus [17, 24, 43] without the use of medications. The diet of a diabetic patient should be as follows:

1. physiological in the composition of products;
2. low-calorie in type 1 diabetes mellitus and subcaloric in type 2 diabetes mellitus;
3. the complete exclusion of easily digestible carbohydrates from the diet is recommended;
4. the diet should contain enough fiber;
5. fats of vegetable origin should be at least 40-50% of all fats of the diet;
6. it is recommended to repeatedly take small amounts of food during the day (which reduces the amplitude of glycemic fluctuations).

Diet therapy should be physiological in composition and correspond to the energy value of food of the "ideal" body weight. It should be hypocaloric with a restriction of animal fats. Today, it is popular to calculate the daily caloric content of food, based on the system of bread units (XE). One bread unit contains 12 g of carbohydrates and 12.5 g of protein. Calculations of bread units are carried out according to the relevant tables. The distribution of bread units is made in accordance with the daily energy requirement: light labor - 12 XE, average load - 17 XE, physical labor - 23-27 XE, in overweight patients - 6-9 XE. The daily need for CW is distributed over 6 meals.

An important component of diet therapy [24] is dietary fiber, which is not digested by enzymes, is slowly absorbed and has a hypoglycemic and lipid-lowering effect, and is well tolerated by patients.

Metered exercise [32] is prominent in the treatment of type II diabetes [20, 31]. glucose, reduce the need for insulin, improve microcirculation, reduce body weight. The level of physical activity should depend on the state of the cardiovascular system and the level of glycemia.

Algorithm for the treatment of patients with type II diabetes mellitus [10].

As for drug therapy, for patients with non-insulin-dependent diabetes, oral hypoglysmiscent drugs are of primary import.

With the appearance of clinical and biochemical manifestations of type II diabetes mellitus, the presence of glycated hemoglobin in the range of 8-9%, and fasting glycemia 10-11.9 mmol / l, monotherapy with oral hypoglycemic agents is prescribed. However, the resource of this therapy is 10 years, and in the future, in order to preserve the compensation of diabetes, improve the prognosis of patients, it is necessary to transfer to combination therapy of sulfonylurea derivatives with other groups of oral hypoglycemic agents, and possibly with insulin therapy.

An urgent problem in the treatment of type II diabetes mellitus is the art of oral therapy. Today, doctors have about 5,000 different hypoglysmic drugs.

Today, the following five groups of hypoglycetic drugs are distinguished.

1. Preparations of the sulfonylurea group:

- I generation: tolbutamide chlorpropamide;

- II generation: glibenclamide, glipizide, glyquidone, glimepiride, gliclazide

MR.

2. Biguanides: metformin.

3. Postprandial stimulants of insulin secretion

- Analogues of meglitinide: repaglinide;

- Phenylalanine derivatives: nateglinide.

4. Glitazones: rosiglitazone, pioglitazone.

5. Drugs that slow down the absorption of carbohydrates: acarbose, miglitol.

Sulfonylurea preparations have been used for the treatment of type II diabetes for more than 50 years. The mechanism of action of drugs in this group is based on the stimulation of insulin biosynthesis in the pancreas. The extrapancreatic effect of drugs is realized by increasing insulin receptors, stimulating the transport of glucose into cells.

The main indication for the use of sulfonylurea derivatives is type II diabetes in patients older than 35-40 years with normal or increased body weight in the absence of the effect of diet therapy. Contraindications are type I diabetes

mellitus, diabetic ketoacidosis [23], diabetes and pregnancy, surgical interventions, infectious diseases, diabetic nephropathy [9], lactation period.

Glibenclamide retains a hypoglycemic effect for 18-24 hours. Most often available in a dose of 0.005, a daily dose of up to 20 mg. Micronized doses are also used.

Glipizide has a duration of action of 8-24 hours, a daily dose of 40 mg. Onset of action 1.5-2 hours after administration.

Glyquidone begins to act 1-2 hours after administration, and the total duration of action is 8-10 hours.

Glimepiride is prescribed once a day. Its initial dose is 0.001 g per day. The drug is produced in tablets of 0.001-0.006 g. Its clinical effect is glucose-dependent.

Gliclazide MR is available under a single trade name diabeton MR. Diabeton MR tablets are created on the basis of a unique hydrophilic matrix, which prolongs the effect of the drug during the day, and the dose of the active substance is reduced from 80 mg to 30 mg in one tablet. Thus, the maximum daily dose is 120 mg. Diabeton MR is prescribed in an average dose of 2 to 4 tablets in most patients always during breakfast once a day, which ensures stable glycemia control during the day. It is proved that diabeton MR provides a more effective hypoglycemic effect than glibenclamide and conventional gliclazide 80 mg taken twice a day. It quickly improves basal and impulse insulin secretion, restores the early peak of secretion. In addition, diabeton MR has an angioprotective, cardioprotective and nephroprotective effects, reduces the risk of hypoglycemia and chronic complications of diabetes.

Of the other groups of oral hypoglycificators, biguanides (metformin) are quite actively used. Hypoglycemic the effect of these drugs is due to a decrease in insulin resistance, gluconeogenesis in the liver, adsorption of glucose and fatty acids in the intestine, activation of glucose utilization in insulin-rich tissues (muscles, liver, adipose tissue).

The main indication for the appointment of metformin is type II diabetes mellitus with obesity, insulin resistance, and a contraindication - ketoacidosis[23] and severe concomitant diseases of internal organs [5, 9, 27]. Metformin is prescribed as monotherapy, and more often - in combination with sulfonylurea preparations, 1 tablet (500 or 850 mg) 2-3 times a day. The maximum therapeutic dose of metformin is 2.5-3 g.

Postprandial stimulants of insulin secretion (repaglinide, nateglinide) are derivatives of carbamoylbenzoic acid and phenylalanine.

The hypoglycemic effect develops after 10 minutes and persists for 4 hours. Repaglinide is available in tablets of 0.001-0.004 g. Taken 2-4 times a day for 10-30 minutes. before the main meals.

Glitazones (rosiglitazone pioglitazone) reduce insulin resistance by increasing the sensitivity of tissues to insulin, which activates the flow of glucose into cells. Drugs can be taken in the form of monotherapy, as well as in combination with sulfonamides or biguanides. Rosiglitazone is available in tablets of 0.002, 0.004 and 0.008 g and is taken in 1-2 tablets regardless of food intake.

Drugs that slow down the adsorption of carbohydrates. The most famous drug of this group is acarbose - a synthetic polysaccharide, inhibits alpha-glucosidase - a group of enzymes of the small intestine that slow down the adsorption of glucose.

The indication for the appointment of acarbose is type II diabetes mellitus, and contraindications are intestinal diseases with digestive disorders, chronic renal failure. Acarbose is used in monotherapy mode or in combination with other drug, is available in tablets of 0.05 and 0.1 g. The drug is prescribed three times a day at the beginning or after meals.

The art of oral hypoglycemic therapy depends on the ability to take into account the individual characteristics of the patient, the advantages and disadvantages of a particular group of hypoglycemic drugs [10]. In particular, the drug should:

- Have sufficient hypoglycemic properties;
- Well tolerated by patients;
- Economically spend endogenous insulin reserves to patients;
- Prevent the development of complications of diabetes mellitus and concomitant diseases.

The experience of treating patients with diabetes mellitus indicates that among oral hypoglycemic agents, sulfonylurea preparations occupy the main position and are of strategic importance. For half a century, they have proven their reliability, effectiveness and enjoy the well-deserved recognition of patients. Among modern drugs - sulfonylurea derivatives, preference should be given to Diabeton MR, which has a multifaceted effect, persistent and long-lasting effect, prevents the development of micro- and macroangiopathies.

Oral hypoglycemic drugs of other groups have a tactical, auxiliary value and are used mainly in combination with sulfonylurea derivatives or insulin therapy. Their independent role is not always reliable.

In total, the use of oral hypoglycemic drugs limits the risk of developing secondary sulfami-resistance. This is an extremely important problem, the cause of which is the depletion of insulin reserves in the β cells of the pancreas. This is the reason for the requirement of yaknayekonnom to use the patient's insulin reserves, and among oral drugs to give preference, which not only stimulate the release of endogenous insulin, but also reduce glucose levels through other mechanisms.

An important problem in the treatment of type II diabetes mellitus is to determine the place of insulin therapy in the treatment of type II diabetes. It should be borne in mind that the absolute indicators for insulin therapy of type II diabetes are progressive weight loss during metabolic decompensation, ketoacidosis [23], severe chronic complications of diabetes, sulfonamide resistance. Temporary insulin therapy for type II diabetes [5, 31] is recommended for its decompensation [10], severe infectious or somatic diseases, surgical interventions and lactation.

Insulin therapy is mandatory for the treatment of type I diabetes mellitus [4, 21, 26], which is also called insulin-dependent. The drug is also indicated for non-insulin-dependent diabetes mellitus during pregnancy and lactation, ketoacidosis [23] and diabetic comas, surgical interventions and infectious diseases, with secondary resistance to sulfonamides and high-degree angiopathies. If the patient is prescribed insulin [22], the rate of administration is selected individually. It is determined by the level of output glycemia and sensitivity to the drug, as well as nutritional characteristics and physical activity. When selecting the necessary dose, the duration of the disease, the level of glycemia, as well as previous experience of hormonal treatment. During the first year of the disease, insulin is prescribed, the dose rate of which is usually not more than 0.5 U / kg / day. Next, the need for this substance is gradually increasing. There is a traditional and intensive regimen of insulin therapy. With the traditional treatment regimen, 70% of the usual daily dose is administered in the morning, the remaining 30% in the evening.

Basic principles of insulin therapy [22]:

1. mainly long-acting insulin is prescribed;
2. short-acting insulins are used in small doses
3. food intake is corrected by peaks in the action of insulin;
4. the number of meals up to 5-6 times during the day;
5. the dose is administered mainly in two injections.

Under normal conditions, insulin enters the portal vein system, then into the liver, where it is half inactivated, the remaining one is on the periphery. All this happens so quickly that the level of glycemia can be maintained within fairly narrow limits even after eating. A different picture is observed when insulin is injected under the skin: it belatedly enters the bloodstream and even more so into the liver, after which the concentration of insulin in the blood remains non-pharmacologically elevated for a long time. This one the lack of subcutaneous insulin therapy [21] and explains the fact that diabetics are forced to conduct self-monitoring of metabolism [8, 14], accounting for their nutrition, physical

Loads [32] and other factors that affect glycemia levels. But the modern strategy and tactics of insulin therapy make it possible to make the lifestyle of patients with type I diabetes mellitus very close to normal [4, 23]. A generally recognized strategy for treating patients with type I diabetes mellitus is intensified insulin therapy. In intensified insulin therapy, a regime of multiple insulin injections is understood, imitating the physiological secretion of insulin by b-cells. As is known, under physiological conditions, basal (background) insulin secretion occurs continuously (including in the absence of food intake, and at night) and is about 1 unit of insulin per hour. With physical exertion, insulin secretion normally decreases markedly. To maintain glycemia within normal limits during meals, significant additional (stimulated) insulin secretion is needed (about 12 units for every 10 g of carbohydrates). This complex kinetics of insulin secretion with a relatively constant basal and variable alimentary level can be simulated as follows: before meals, the patient injects various doses of short-acting insulin, and background insulinemia is supported by injections of insulin of prolonged action. This type of insulin therapy is also called basic-bolus insulin therapy.

Basic principles of intensive insulin therapy [22]:

- Insulins that act for a short time are more often used;
- The number of injections of hormonal drugs per day is at least 3-4;
- Insulin, acting for a long time is used in small doses in the form of the main input;
- Injections are adjusted to meals, not the other way around.

As a rule, patients make injections of short-acting insulin before meals three times a day, sometimes more often. The basal need for insulin is covered most often by two injections of insulin prolonged action per day. The following insulin therapy regimen is used:

1. in the morning (before breakfast) the introduction of insulin of short and prolonged action;

2. in the afternoon (before lunch) the introduction of short-acting insulin;
3. in the evening (before dinner) the introduction of short-acting insulin;
1. at night, the introduction of insulin of prolonged action.

Such a scheme is basic, in each patient on certain days it may have changes: the number of short-acting insulin injections may be more or less depending on specific circumstances (for example, additional meals, unexpectedly high blood sugar figures, concomitant diseases, etc.) Speaking of insulin doses, it should be emphasized that there can not be a once and for all selected dose of insulin, it will often change in accordance with changes in the patient's lifestyle. The only criterion that allows you to correctly determine the dose of insulin is the glycemic numbers [8, 10, 14, 22].

A review of the scientific literature showed that the problem of diabetes mellitus is very complex and relevant for patients of childhood, young, middle and old age, despite the significant differences in the course of this disease, which indicates the need for scientific research on this problem.

CHAPTER 2

OBJECT AND METHODS OF RESEARCH

Given that the object of our study was patients of childhood, adolescence, middle and elderly age, suffering from diabetes mellitus, women with gestational diabetes, and the subject of our scientific study was one of the diseases of the endocrine system - diabetes mellitus; classification, diagnosis, clinical manifestations of this disease and their features in childhood, adolescence, middle and old age, as well as the organization of the nurse's work on the prevention and care of patients with diabetes mellitus, in this scientific study we used the following research methods:

1. general clinical methods of studying patients used in endocrinology for various age categories of patients with diabetes mellitus (laboratory and instrumental research methods);
2. analytical method;
3. statistical methods.

Study design:

1. The study of the disease of diabetes mellitus, its classification, diagnosis, features of the clinical picture and treatment - the study and analysis of scientific literature.
 2. Investigation of the features of the occurrence and course of diabetes mellitus in childhood and adolescence (observation of 63 patients of this age with diabetes mellitus).
 3. Investigation of the features of diabetes mellitus in adults and the elderly (observation of 122 patients of this age with diabetes mellitus).
 4. Investigation of the features of diabetes mellitus in pregnant women (observation of 8 pregnant women with diabetes mellitus).
1. The study of the features of the nurse's work for the effective prevention and management of diabetes mellitus was carried out in medical and prophylactic medical institutions.

In total, 193 patients with diabetes took part in the study.

CHAPTER 3

DIABETES MELLITUS IN CHILDHOOD AND ADOLESCENCE

In most countries, type 1 diabetes (T1D) occurs in more than 90% of all cases of diabetes in children and adolescents, the diagnosis of type 1 diabetes is established in less than half of cases in persons before the age of 15. Type 2 diabetes in children and adolescents is also becoming a more common disease and accounts for a significant portion of cases of type 2 diabetes with manifestation at a young age in certain risk populations.

However, in recent decades, type 2 diabetes mellitus (T2DM) in children and adolescents has become an increasingly significant public health problem worldwide due to the relatively recent designation of this problem in this age group. Many children with early-onset diabetes may be misdiagnosed with type 1 diabetes. Conversely, as there is an increase in body weight in the population, overweight adolescents with autoimmune diabetes may be misdiagnosed with T2DM. Type 2 diabetes is often associated with risk factors for cardiovascular disease that may already be present by the time of diagnosis, making it especially important to normalize blood glucose levels, as well as the diagnosis and treatment of hypertension and dyslipidemia.

To study the features of diabetes mellitus in childhood and adolescence, we proceeded from the definition that diabetes mellitus is a group of metabolic diseases that are characterized by chronic hyperglycemia caused by impaired insulin secretion, impaired effects of insulin or a combination of these disorders. In diabetes mellitus, there are violations of carbohydrate, fat and protein metabolism, which are caused by impaired insulin action on tissues. If ketone bodies are present in the blood and urine, immediate therapy is indicated, as ketoacidosis can develop rapidly.

Diagnostic criteria for diabetes mellitus in childhood and adolescence are based on the measurement of glucose indicators in blood and the presence or absence of symptoms. There are three ways to diagnose diabetes, and each

diagnosis, in the absence of a certain hyperglycemia, should be confirmed the next day using one of the three methods shown in Table 3.1.

Table 3.1.

Criteria for diagnosing diabetes mellitus and the use of three different ways to diagnose diabetes in the children and adolescents we observe

	Method of diagnosis of diabetes mellitus	Number of children and adolescents
1.	Symptoms of diabetes mellitus in combination with the random detection of a plasma glucose concentration of 11.1 mmol / l (200 mg %)*. Accidental detection means detection at any time of the day without taking into account the time elapsed since the last meal.	23
2.	Fasting plasma glucose levels of 7.0 mmol/L (126 mg%)**. An fasting condition is defined as a lack of calorie intake for at least 8 hours.	35
3.	The glucose level 2 hours after the load is 11.1 mmol / l (200 mg%) during PGTT. The test should be carried out in accordance with WHO recommendations using a glucose load containing the equivalent of 75 g of anhydrous glucose dissolved in water or at a dose of 1.75 g/kg body weight up to a maximum dose of 75 g.	5
*The corresponding levels (mmol/L) are ≥ 10.0 for venous whole blood and ≥ 11.1 for capillary whole blood and ** ≥ 6.3 for both venous and capillary whole blood.		

In diabetes mellitus, children usually have characteristic symptoms, such as polyuria, polydipsia, visual impairment and weight loss in combination with glucosuria and ketonuria.

In the most severe form, developed ketoacidosis or rare, non-ketoacidotic, hyperosmolar status can lead to the development of stupor, coma and - in the absence of effective therapy - to death.

The diagnosis is usually quickly confirmed when determining a significant increase in blood glucose levels. In this situation, if ketone bodies are determined in the blood or urine, urgent therapy is indicated. Waiting for the next day to confirm hyperglycemia can be dangerous and contribute to the rapid development of ketoacidosis.

In the absence of symptoms or the presence of mild symptoms of diabetes mellitus, accidentally detected hyperglycemia or hyperglycemia in conditions of acute infectious, traumatic, circulatory or other types of stress may be transient and should not in itself be regarded as a fact of diagnosing diabetes mellitus. The diagnosis of diabetes should not be based on a single determination of blood glucose levels alone. Diagnosis may require continued observation and determination of fasting blood glucose and/or 2-hour blood glucose levels and/or an oral glucose tolerance test (GHTT).

PGTT should not be carried out if the diagnosis of diabetes mellitus can be established on the basis of the criteria for fasting glycemia, with random determination of blood glucose levels or with the detection of excessive postprandial hyperglycemia. This test is rarely indicated for the diagnosis of type 1 diabetes in childhood or adolescence.

If in doubt, periodic retesting should be carried out before a diagnosis is made.

Disorders of glucose tolerance (NGT) and disorders of fasting glycemia (NGN) in children and adolescents.

NGT and NGN are intermediate stages of the natural course of carbohydrate metabolism disorders between normal glucose homeostasis and diabetes mellitus.

NGN and NGT are not equivalent concepts and represent various violations of glucose regulation. NGN is an indicator of initially impaired carbohydrate metabolism, while NGT is a dynamic indicator of impaired carbohydrate tolerance after a standardized glucose load.

The presence of NGN and/or NGT in children and adolescents is now considered "pre-diabetes", which means that there is a relatively high risk of developing diabetes in this group of patients.

They can be observed as intermediate stages in the course of any of the variants of diabetes mellitus.

NGN and NGT may be constituents of metabolic syndrome, which includes obesity (especially abdominal or visceral obesity), dyslipidemia with elevated triglyceride and/or LDL cholesterol fractions, and hypertension.

In people with indicators corresponding to NGT or NGN, in everyday life there may be euglycemia with normal or almost normal levels of glycated hemoglobin and in people with NGT, hyperglycemia can be detected only when carrying out PGTT.

The following categories of fasting plasma glucose levels have been identified:

1. Fasting plasma glucose (UGPN) level <5.6 mmol/L (100 mg%) = normal fasting glucose level
2. UGPN ≥ 5.6 – 6.9 mmol/L (100–125 mg%) = NGN
1. UGPN ≥ 7.0 mmol / l (126 mg%) = the alleged diagnosis of diabetes mellitus (the diagnosis must be confirmed in accordance with the diagnostic criteria described earlier).

During the GHTT, the relevant categories were identified, which are given below:

1. 2-hour after-load glucose <7.8 mmol / l (140 mg%) = normal glucose tolerance.
2. 2-hour after-load glucose 7.8-11.1 mmol / l (140-199 mg%) = NGT.
1. 2-hour after-load glucose >11.1 mmol / l (200 mg%) = the alleged diagnosis of diabetes mellitus (the diagnosis must be confirmed in accordance with the diagnostic criteria described earlier).

Also in the age category of children of neonatal age, neonatal diabetes should be distinguished. Hyperglycemia requiring insulin therapy in the first three months of life is known as neonatal diabetes mellitus.

This rare condition (1 in 400,000 newborns) may be associated with intrauterine fetal growth retardation. Approximately half of the cases are transient and are associated with maternal isodisomy and other imprint defects of chromosome 6. In patients with transient neonatal diabetes, a permanent form of diabetes mellitus may develop with age.

Persistent forms were associated with pancreatic aplasia, activating mutations of *KCNJ11*, the gene encoding the ATP-sensitive subunit of the potassium canal, mutations of insulin promoter factor (chromosome 7) with pancreatic aplasia, complete glucokinase deficiency (chromosome 7), mutations of the *FOXP3* gene (T-cell regulatory gene).

Mitochondrial diabetes is often associated with sensorineural deafness and is characterized by progressive non-autoimmune beta cell deficiency.

Maternal transmission of mutated mitochondrial DNA (mtDNA) can lead to congenital diabetes.

Children also have cystic fibrosis (cystic fibrosis) and diabetes mellitus.

Diabetes mellitus caused by cystic fibrosis (cystic fibrosis) is primarily caused by insulin deficiency, but secondary insulin resistance in acute disease due to infectious complications and taking pharmacological drugs (bronchodilators and glucocorticoids) can contribute to the development of disorders of glucose tolerance and diabetes mellitus.

Diabetes mellitus due to cystic fibrosis tends to appear in the later stages of the disease, usually in adolescence and early adolescence. If there is cirrhosis, then this contributes to insulin resistance. The development of diabetes mellitus due to cystic fibrosis, is a poor prognostic sign and is associated with a rise disability and mortality. Poorly controlled diabetes interacts with immune responses to infections and stimulates catabolism.

Screening recommendations range from random glucose testing annually to all children with cystic fibrosis ≥ 14 years to an oral glucose tolerance test annually for all children over the age of 10, but traditional measurements such as fasting plasma glucose, PGTT and HbA1c may not be necessary methods for diagnosing diabetes mellitus in individuals with cystic fibrosis (cystic fibrosis).

Initially, insulin therapy is necessary only for respiratory infectious complications in acute or chronic infectious episodes, but over time, insulin therapy becomes constantly necessary. Initial doses of insulin are usually small (more as additional than completely insulin replacement therapy). In some patients, early insulin therapy before the onset of symptoms of hyperglycemia leads to favorable metabolic effects that improve growth, body weight and lung function.

Stress hyperglycemia has been described in up to 5% of children who were enrolled in emergency rooms. Acute development of the disease or damage; traumatic injuries, febrile fever with seizures, and fever (>39 C) were the most characteristic co-symptoms.

The described frequency of occurrence of progression to obvious diabetes mellitus varies from 0% to 32%. Children with randomly diagnosed hyperglycemia and without serious comorbidities were more likely to develop diabetes than children with serious medical conditions. Prognostic significant positive or negative significance for the development of type 1 diabetes in children with stress hyperglycemia was the determination of antibodies to islet cells and to insulin.

Severe hyperglycemia, detected in the presence of severe infectious complications, trauma, surgery, respiratory distress, circulatory and other types of stress, may be transient and requiring treatment, but should not in itself be considered as a diagnosis of diabetes mellitus.

Screening for the presence of antibodies associated with the development of diabetes mellitus may be useful in selected patients with stress hyperglycemia.

It should be noted that technological improvements have made a revolutionary contribution to the management of type 1 type 1 (purified insulins and distribution systems, monitoring of blood glucose levels, insulin analogues). In contrast, technological improvements in entertainment, occupational safety, and transportation combined with economic factors have led to the fact that high-calorie food becomes universally available and inexpensive, which leads to the development of type 2 diabetes in children and complicates its treatment.

Primary prevention of type 2 TD in children and adolescents targets the obesity pandemic and includes changes in eating behavior and leisure activities at home, schools and communities characterized by excess calorie intake and significant reductions in energy expenditure in children and adults; optimization of the condition of the fetus during pregnancy and recommendations on the need for breastfeeding.

In total, 63 pediatric and adolescent patients with diabetes mellitus took part in this part of the study.

CHAPTER 4

FEATURES OF DIABETES MELLITUS IN ADULTS AND THE ELDERLY

Among middle-aged and elderly people with type 2 diabetes (T2DM) is much more common than type 1 diabetes - this form of the disease is diagnosed in 90% of people with high blood sugar (hyperglycemia). If earlier the disease developed mainly after 40 years, today type 2 diabetes is much younger, and the number of patients annually increases exponentially. Figuratively speaking, the world has been gripped by the T2D pandemic. The insidious disease acts surreptitiously, not making itself felt in the initial stages and gradually turning a person into a disabled person.

Overweight elderly people are a "target" for type 2 diabetes.

The main difference between type 2 diabetes is the immunity of body cells to the action of the hormone insulin, i.e. their insulin resistance. In a healthy person, insulin "instructs" the cell membranes of various tissues to "pass inside" glucose - the main source of energy. In a patient with type 2 diabetes, the cells do not perceive the "commands" of insulin, and the membrane remains "locked".

As a result:

1. The tissues of various organs do not receive the energy necessary for the normal performance of their functions.

2. The glucose content in the blood exceeds the norm (hyperglycemia occurs), which most adversely affects the ability of the main fluid of our body to transport oxygen from the lungs to the tissues, and carbon dioxide from the tissues to the lungs.

1. The liver, which normally always stores a "strategic reserve" of glucose, responds to "requests for help" of starving cells of skeletal muscle, brain, heart, etc. And throws the "stored" sugar into the blood, further increasing its content in it.

1. Insulin-producing "islets" in the pancreas work "for wear", reacting to high blood sugar. Over time, this leads to their depletion and loss of their secretory functions.

Causes of type 2 diabetes

The exact causes of insulin resistance are not yet known, but the risk factors for type 2 diabetes are well understood. The likelihood of the disease is increased by:

Hereditary predisposition. A bad family history is a cause for concern. The tendency to hyperglycemia in children and grandchildren of diabetics is confirmed by long-term statistics. If one of your close relatives is sick or had diabetes, you need to take this circumstance into account and try to minimize the effect of external factors that can provoke the onset of the disease.

Infectious diseases, hormonal and metabolic disorders. A link was found between hepatitis, polycystic ovaries, hypertension, increased glucocorticosteroid content, excess "bad" cholesterol and the development of insulin resistance.

Diabetes of pregnant women (gestational). All pregnant women must take a blood test for sugar. Do not consider this a whim of a gynecologist or therapist. During gestation, a woman may experience disorders of carbohydrate metabolism, disappearing after childbirth without any treatment. Hyperglycemia complicates the course of pregnancy, so expectant mothers with high sugar should adhere to a special diet. And although after childbirth, the level of glucose in the blood usually normalizes, you need to remember that gestational diabetes in the anamnesis is one of the risk factors for the development of type 2 diabetes in the climacteric period.

Improper nutrition. Fast food, semi-finished and ready-made products with a large number of "fast" carbohydrates, i.e. practically instantly converted into glucose and absorbed from the intestines into the blood, today prevail in our diet. The danger lurks even in those products that are positioned as useful. For example, extrusion processing of oatmeal significantly increases the amount of

sugar и split starch in Hercules flakes, so their glycemic index is not much lower than that of french fries.

Obesity – the risk of diabetes is directly proportional to the body mass index. The greater the degree of obesity, the more likely a failure in the hormonal regulation of glucose metabolism. The most dangerous fat deposits are of the android type, that is, in the abdomen and upper body, as well as fat accumulations inside the abdominal cavity (visceral fat).

Stress. Back in the 19th century, in the troubled times of economic crises, type 2 diabetes received an apt name - "the disease of stockbrokers". It was noticed that daily risking a lot of money stockbrokers, as well as other people whose occupation was associated with constant stress, very often fell ill with diabetes.

Intermittent, shallow nighttime sleep with insufficient ventilation of the lungs is another reason for impaired glucose metabolism and the start of type 2 diabetes. Therefore, it is so important to know and follow the rules of healthy sleep.

Insufficient physical activity. Modern man lives at high speeds. To keep up with everything, we use a private car, taxi, public transport. To make the career successful, we sit at the computer screens for 10-12 hours. Fortunately, lately morning jogging and cycling, swimming pool and gym classes have become fashionable mainstream. Unfortunately, not everyone understands their importance and makes them part of their lives. In the absence of physical exertion, metabolic disorders overtake a person at a much earlier age - including therefore insulin-independent diabetes "rejuvenated".

Sedentary work and constant overwork provoke the development of type 2 diabetes.

It is important to know that the combination of the above factors further increases the risk of type 2 diabetes. And the presence of the disease, in turn:

1. reduces the tolerance of the cardiovascular system to stress and physical exertion;

2. reduces muscle tone and endurance;
1. disrupts nighttime sleep and metabolism, turning the normal desire to lose weight into an almost unsolvable task.

Symptoms and consequences of type 2 diabetes

Unlike type 1 diabetes, T2DM develops slowly and imperceptibly: mild or moderate hyperglycemia for a long time (often for years) does not manifest itself at all. However, it is possible to identify a violation of glucose metabolism already at the asymptomatic stage - accidentally or during a routine preventive examination.

If this can be done at the very beginning, the start of the disease can at least be postponed, and without any treatment. A full night's rest, stress management, weight loss and diet correction can restore hormonal regulation, improve metabolism and forget about the problem for many years.

The first symptoms of type 2 diabetes, as a rule, occur when the disease has already started, hyperglycemia is persistent and a person needs hypoglycemic therapy.

What symptoms of type 2 diabetes appear first?

At first, an increase in blood sugar signals itself with the following symptoms:

1. dry mouth, thirst, as a result of which a person drinks a lot of fluids;
 2. unreasonable weakness and drowsiness - diabetics constantly feel sleepless, quickly get tired with physical and mental stress,
 3. frequent urination, including at night;
 4. skin itching, which is most pronounced in areas with thinned skin (for example, in the perineum in women);
1. bulimia (abnormally high appetite);
 1. slowly and poorly healing wounds - even the smallest scratches heal poorly in a diabetic (in a diabetic, even a small scratch can be a big problem);
 1. blurred vision (veil before the eyes) due to damage to the vessels of the retinal membrane of the eye;

2. numbness of the limbs (manifestations of diabetic neuropathy).

Symptoms with moderate and severe degree of the disease.

As type 2 diabetes progresses, the symptoms become more pronounced, and the above signs are joined by manifestations of disruption of the work of various organs.

Most of all, the cells of the brain and heart need glucose and oxygen. They are the first to "fall under attack", experiencing chronic oxygen starvation and lack of "fuel". In addition, excess sugar in the blood leads to obliteration of arterial vessels - they lose elasticity and elasticity (become "glass"), the lumen of the arteries narrows, cholesterol plaques appear on the walls. As a result, patients:

1. pressure rises;
2. heart rhythm is disturbed;
3. significantly increases the risk of heart attack and stroke.

Diabetes affects blood vessels, heart, brain, kidneys, lower extremities

Not detected in time and uncontrolled disease also affects other tissues and organs. In diabetics, kidneys and liver suffer, resistance to infections decreases, osteoporosis develops, trophic ulcers appear on the feet and legs. Any cold is fraught with serious complications, and pneumonia is extremely difficult to treat - including therefore in people with type 2 diabetes, COVID is usually severe.

Diagnostics. In modern clinical practice, the diagnosis of "diabetes mellitus" is established on the basis of the result of the analysis for glycated hemoglobin (HbA1C). Once in the blood, glucose molecules can penetrate into erythrocytes and firmly binds to the receptors of the hemoglobin protein - glyce it. The more glucose in the blood, the more of its molecules "settle" on hemoglobin. Glucose is retained on the protein for 3-4 months, preventing it from performing its function - to transport oxygen and carbon dioxide.

Analysis of glycated hemoglobin reveals the percentage of such "long-occupied" molecules. In a healthy person, this figure does not exceed 5.7%. A glycated hemoglobin level of 5.7% to 6% signals the first problems with glucose

metabolism. With an increase in HbA1C to 6.1% -6.4%, they talk about prediabetes, an indicator above these values indicates the presence of the disease.

Knowing the percentage of glycated hemoglobin, the doctor can not only make a diagnosis, but also control the course of the disease, adjusting the treatment if necessary.

In type 2 diabetes, diagnosis also includes an assessment of pancreatic function. From this indicator depends on the choice of methods of hypoglycemic therapy.

In addition, in diabetics, a "lipid panel" is determined, the condition of the kidneys, fundus, peripheral nerves and blood vessels is assessed, if possible and if necessary, daily monitoring of blood pressure (SAD) and cardiograms (Holter monitoring) are prescribed.

With an understanding of the characteristics of the course and competent treatment of type 2 diabetes mellitus, the symptoms of the disease lose their intensity, the quality of human life improves, and the risk of serious complications decreases.

Methods of treatment of diabetes mellitus type 2

Treatment of type 2 diabetes is selected and carried out taking into account the stage of the disease, the state of the insulin-producing "islets of Langerhans" in the pancreas and concomitant pathologies.

With an HbA1C level of 5.7% to 6%, you can do only with diet and lifestyle correction. Normalize glucose metabolism and avoid the onset of the disease in the vast majority of cases allows:

1. reducing the consumption of sugar and fast carbohydrates;
2. improving the quality of night sleep;
3. weight correction;
4. long walks, swimming pool, gym;
5. elimination of the source of constant stressful situations (if necessary, up to a change of work, place of residence, etc.).

Recently, leading Western diabetologists strongly advise such patients to combine the above measures with taking medications that work in two directions:

1. returning muscle cells the ability to respond to insulin and use glucose for their vital activity;
2. slowing down and preventing the absorption of easily digestible carbohydrates in the intestine.

If the pancreas is not yet completely "tired" and produces the hormone in the amount necessary for the body, you can reduce the level of glucose in the blood without insulin injections.

With a mild course of type 2 diabetes in the initial stages, drugs that improve glucose metabolism in combination with a low-carbohydrate diet and hypoglycemic products (Jerusalem artichoke, ginger, chicory, cinnamon, decoctions and infusions of blueberries, bean pods, etc.), as a rule, allows you to take the disease under control. How well this turns out is judged by the level of glycated hemoglobin: against the background of treatment, it should not exceed 6.5% -7%. The analysis should be done no more than once every 3-4 months and at least every six months.

If necessary, the endocrinologist adds other medications. Diabetics are also prescribed treatment aimed at supporting hypoglycizing therapy and preventing the occurrence of complications of the disease:

1. injections of antioxidants;
2. magnetotherapy, which reduces the manifestations of diabetic neuropathy and angiopathy, improves the functioning of the kidneys and pancreas;
3. antihypertensive drugs, antiarrhythmics, etc.

The nurse should remember that each medication has its own side effects. Therefore, in the process of treatment, it is necessary to periodically take tests. Focusing on their results, the doctor makes adjustments to the scheme of antidiabetic and auxiliary therapy.

There are features of the course of type 2 diabetes mellitus, when insulin treatment is prescribed, namely if the disease is diagnosed in the later stages, and the "worn" gland is not able to produce the required amount of insulin, in the scheme. The type of insulin, the multiplicity of injections and the dose are selected individually, focusing on the blood sugar content and the body's reaction.

Sometimes patients are interested in whether type 2 diabetes can be cured forever?

Unfortunately, there is no method or medicine that allows you to completely cure this chronic ailment. However, such an answer to the question "is it possible to cure type 2 diabetes" will be incomplete and incorrect. With diabetes, you can and should learn to live - and this life can be quite comfortable, long and happy. To make it so will help the right attitude to the disease, or rather to your health. To do this, you need to:

Change eating habits and diet - reduce the number of calories, remove animal fats, salinity, smoked meats, marinades, sugar, semolina, low-grade pasta, grapes, raisins, persimmons, figs, etc. Eat five times a day after three hours, each time reducing the caloric content of dishes. Do not eat at night.

Do not smoke and give up alcoholic beverages. Diabetics need to give up smoking.

Buy a glucometer and monitor blood sugar at least 2 times a day - in the morning and before bedtime. Periodically assess the glycemic profile, making an analysis on an empty stomach and 2 hours after each meal, if necessary - another 2-3 times during the night. Based on the results, adjust nutrition, physical activity, drug treatment.

A full night's sleep is an important condition for the uncomplicated course of diabetes. Make walks in the fresh air, swimming pool, cardio training part of your life. Achieve weight loss and constantly monitor the body mass index. Sleep with an open window, at least 8 hours, a full, deep sleep. Eliminate the causes that disrupt the normal process of sleep.

With the help of a nurse and the attending physician, choose an effective treatment, combining drug and non-drug methods. Adjust the dose of drugs and their combination, taking into account changes in the level of glycated hemoglobin and biochemical blood parameters, symptoms of the disease, general condition.

Prevention of type 2 diabetes in adults and the elderly.

Worldwide, the prevalence of obesity is increasing in all population segments. The epidemic of obesity and its complications is driving a significant and continuing increase in direct and indirect health care costs. Prevention of type 2 diabetes consists of preventing obesity in those who are not overweight and treating obesity in individuals with a body mass index (BMI) >85 percentiles (or even less in non-European populations). The results of studies have shown that a relatively small decrease in body weight can reduce the level of development of diabetes in populations at risk.

Intervention parameters in the adult population show difficulties in changing lifestyle and eating habits.

The obstacles are very large, given that the trends in nutrition and leisure activities that exist in popular social centers are very attractive, ubiquitous and highly advertised.

The social change required is of such a magnitude that it requires tremendous support from the community and the government.

In total, 122 middle-aged and elderly patients with diabetes mellitus took part in this part of the study.

CHAPTER 5

FEATURES OF DIABETES MELLITUS OF PREGNANT WOMEN

Diabetes mellitus can manifest as diabetes of pregnant women (gestational diabetes) and diabetes mellitus (type 1 or type 2) in pregnant women.

Gestational diabetes includes only diabetes, which is detected during pregnancy (about 2% of pregnant women). Basically, the manifestations of gestational diabetes disappear after childbirth and tolerance to carbohydrates is normalized. However, after 5-15 years, 20-40% of women with gestational diabetes have clinical diabetes. Pregnancy with gestational diabetes has an increased risk of perinatal mortality and fetopathy.

Impaired glucose tolerance is more often observed in pregnant women of older age (more than 30 years), if there is a history of miscarriages and stillbirths, the birth of children weighing more than 4.5 kg or data on a large fetus in this pregnancy, obesity of a pregnant woman, glucosuria. The diagnosis of "diabetes of pregnant women" is made if 2 out of 3 indicators of the glucose-tolerant test exceed the following levels: on an empty stomach - 5.8 mmol / l, after 1 hour. - 9.6 mmol/L, after 2 hours. - 8 mmol / L. It is believed that the main cause of impaired glucose tolerance in pregnant women is the influence of contrainsulin placental and other hormones. Pregnancy makes increased demands on the insular apparatus, which leads to the identification of its hidden inferiority.

Diabetes affects not only the course of pregnancy, but also the fate of the fetus and, in turn, pregnancy affects the course of diabetes (the mortality rate of women in labor with diabetes is 1-2%, and perinatal mortality is 5-30%).

In the early stages (10-12 weeks) of pregnancy, there is a decrease in the need for insulin and an improvement in the clinical course of diabetes, hypoglycemia may occur, which is associated with the utilization of glucose by the fetus. However, in the presence of toxicosis of pregnant women, the development of ketoacidosis is possible.

In the II and III trimester, the need for insulin increases (especially in patients with CNDDM), which is associated with the contrainsulin effect of placental hormones, hyperproduction of other hormones. Due to metabolic disorders, inadequate insulin therapy in pregnant women, late toxicosis (nephropathy, preeclampsia), polyhydramnios (10-50%), miscarriages and premature birth (10-30%), intrauterine fetal death (more often at 37-38 weeks) are possible. The development of late toxicosis is very dangerous for both the fetus and the mother. The combination of late toxicosis with nephropathy or pyelonephritis can lead to kidney failure and death. The frequency of stillbirths is 18-46%.

The course of diabetes during childbirth worsens, decompensation of diabetes, ketoacidosis is possible. This is associated with the hyperproduction of contrainsulin hormones. After childbirth for the first 2-3 days, the course of diabetes improves (the placenta, which produces "diabetogenic" hormones, is removed), but after 6-7 days the course of diabetes becomes the same as before childbirth.

Childbirth in patients with diabetes is more difficult, often there is a birth weakness, which can lead to fetal death. In the postpartum period, lactation deficiency may occur.

Children born to patients with diabetes women have a large body weight (4-6 kg), functionally immature (lethargy, drowsiness, increased nervousness, impaired breathing, a tendency to pneumonia, etc.), often congenital malformations (skeletal defects, defects of the cardiovascular, nervous and genitourinary systems), the frequency of perinatal mortality increases.

Contraindications to the preservation of pregnancy in patients with diabetes:

- severe course of TD with a tendency to ketoacidosis and hypoglycemia
- TD with insulin resistance (as a consequence of hyperproduction of ACTH, GH, catecholamines, glucocorticoids)

- in the presence of distinct complications: retinopathy (especially proliferative), nephropathy (especially UF)
- with a combination of diabetes with tuberculosis, Rh incompatibility
- if earlier children were born with malformations or TD, stillbirth.

Pregnant women, patients with diabetes, need joint dispensary observation of an endocrinologist and an obstetrician-gynecologist. In the first half of pregnancy, women should be monitored 1 time in 2 weeks, in the second half - weekly. During the period of pregnancy, women are hospitalized in specialized departments 3 times: at the beginning of pregnancy (8-12 weeks), at 20 - 28 weeks, 2 - 3 weeks before childbirth (36 - 38 weeks). Pregnant women are hospitalized with decompensation of diabetes or infection immediately.

The task of the endocrinologist is the maximum compensation for diabetes for the entire period of pregnancy, childbirth and the postpartum period. It is advisable to plan pregnancy only with a compensated course of DD.

Treatment of pregnant patients with diabetes is carried out according to general principles: balanced rational nutrition, a sufficient amount of vitamins, the corresponding energy value of food. The main special method of treatment is insulin therapy. The use of oral hypoglycemic drugs during pregnancy is contraindicated. Use simple insulin 3 to 5 times a day, or a combination of long-acting insulin (20-30% of the daily dose) with the administration of simple insulin. The appointment of exclusively simple insulin is indicated for ketoacidosis, the presence of intercurrent diseases, during childbirth. The need for insulin during pregnancy changes: in the 1st trimester it sometimes decreases, in the 2nd - it grows. A few weeks before the birth, maximum compensation for the SD is sought. To prevent hypoglycemia, the dose of insulin at the beginning of labor is reduced and dose adjustment during childbirth is carried out according to the level of glycemia. It is necessary to establish intravenous insulin administration of 1-2 units / hour. with 5% glucose solution 100-150 ml / h. After childbirth, the dose of insulin is set according to the level of glycemia, which should not exceed 7.5 mmol / l.

Nursing of newborns is carried out on the principle of managing premature babies. It should be borne in mind that during pregnancy they have hyperglycemia, as a result of which hyperinsulinemia and therefore hypoglycemia is possible after childbirth. To prevent it, 1-1.5 hours after birth, a 10% glucose solution under the control of blood sugar levels is administered drip (intravenously or through a probe). With the phenomena of hypoglycemia, a newborn is injected with a 40% glucose solution of 2 ml per 1 kg of body weight, and then switch to intravenous drip administration of 10% glucose at a time of 75 ml / kg per day. Hypoglycemia in newborns (with mother's cd) can last 3-5 days and during this, glycemic level control should be carried out 3 to 4 times a day.

In total, 8 pregnant women of young and middle age with diabetes mellitus (gestational diabetes) took part in this part of the study.

CHAPTER 6
FEATURES OF THE NURSE'S WORK FOR THE EFFECTIVE
PREVENTION AND MANAGEMENT OF DIABETES MELLITUS TYPE 1
AND 2

It should be noted that an important role in the quality of life of patients with diabetes mellitus is played by the competent and effective organization of nursing. However, the fight against diabetes mellitus and its complications depends not only on the coordinated work of all links of the specialized medical service, but also on the patients themselves, without whose participation the targets for compensating for carbohydrate metabolism in diabetes mellitus cannot be achieved, and its violation causes the development of vascular complications.

Every year on November 14, World Diabetes Day is celebrated around the world, which was introduced in 1991 by the International Diabetes Federation and the World Health Organization in response to the threat of an increase in the onset of diabetes worldwide.

In 2020, World Diabetes Day will be held under the motto "The Nurse and Diabetes", and 2021-2023 will be held under the motto "Access to Diabetes Care".

The theme was not chosen by chance. For the first time, nurses began to take part in the treatment of patients with diabetes in 1924. Two years earlier, insulin therapy became available, and the American endocrinologist Elliot Proctor Joslin first spoke about the fact that "lack of training is as dangerous as a lack of insulin." He called for the active involvement of nurses in the education of patients, calling diabetes "a disease, mainly for sisters."

The role of the nurse is not only important, but also significant, because she is required to accurately fulfill all the doctor's prescriptions to patients with diabetes mellitus, the presence of such invaluable qualities as humanity and compassion, sociability, and responsiveness. To be able to professionally help

the patient, a nurse must be well aware of the causes of diabetes, its complications, all manifestations and responsiveness. To be able to professionally help the patient, a nurse must know well the causes of diabetes, its complications, all manifestations and methods of compensation. Understand the problems of patients. The attending physician diagnoses and prescribes treatment, determines the patient's problems, and it is the nurse's job to determine all the difficulties that arise from these problems.

The help of nurses to the family of a patient with diabetes in the process of adaptation, teaching the family the rules of life with a diabetic is invaluable. Nurses must regularly contact the family members of the patient, the data is transferred to the attending physician, who must know the peculiarities of the lifestyle and psychological climate of the family.

Diabetes mellitus requires great knowledge and competence from all medical personnel.

It is no secret that during an outpatient appointment, a specialist doctor has only a few minutes to talk with a patient about diabetes mellitus, because he needs to examine the patient, analyze the results of the studies, fill out all the necessary medical documentation. And then the School of Diabetes comes to the rescue, the main goal of which is to improve the quality of life and active longevity of patients, and the main task is to familiarize patients with diabetes mellitus, its treatment, self-control, self-help tactics in emergency conditions, training in the organization of proper nutrition, diabetic diets, etc. Nurses are indispensable in this work. The main task of a person with diabetes is the desire to compensate for the disease, so a significant role in this process is assigned to nurses.

The nurse teaches patients and their relatives (if necessary) about the new risk factors for the development of the disease, such as: genetic predisposition (diabetes in close relatives), stress, excessive consumption of easily adaptable carbohydrates (sugar, honey, sweets, etc.); age (the older the person, the higher degree of risk); obesity, etc, the main preventive measures, such as:

- monitor blood glucose levels if close relatives have diabetes, as well as if your age exceeds 40 years;
- to achieve a decrease in body weight to a normal level with developing obesity.
- eat right (limit the consumption of sugar and foods containing sugar, sugary drinks, white bread, reduce the amount of saturated fats - margarine, butter, cheese, fatty meat, eat fruits and vegetables from 3 to 5 times a day, eat smaller portions);
- lead a lifestyle with sufficient motor activity, taking into account the age and capabilities of your body;
- give up bad habits, alcohol consumption, tobacco smoking.

The nurse promotes the ideology of preserving health in diabetes mellitus; teaches patients to make non-standard and independent decisions in favor of health, to anticipate the risk and its consequences when choosing actions that destroy health. A systematic approach allows you to motivate their desire for self-learning.

The powers given to the nurse by this creative and independent work make it possible to use the reserves of medical preventive training in the "School of Diabetes":

1. take into account the individual wishes of patients.
2. use the motivation and level of readiness of the patient to maintain stable compensation for diabetes mellitus.
3. apply new technologies for teaching the basics of preventive medicine and medical rehabilitation for patients with diabetes;
4. take into account the possibilities of the media and new forms of education for adult patients.

The professional demand and success of nurses working with patients with endocrine pathology largely depends on the following factors:

1. experience that contributes to the screening of hidden personality traits and the potential of a trained patient with diabetes;

2. having your own developed communication skills, competent speech, confidence, professional supportive behavior;
3. awareness of the level of responsibility to the patient, his family and society as a whole, the importance of their own contribution to public health;
4. constant development of own pedagogical skills;
5. control of the influence of risk factors on complications of diabetes mellitus in accordance with WHO requirements.

The ideology of motivation of human behavior in favor of health refers to new concepts that are not quite assimilated even by medical workers. Society, starting with doctors, is poorly versed in the basics of sanology (health science), since the compulsory course of study deals more with the issues of treatment than the prevention of diseases. Meanwhile, the WHO has released economic statistics showing that \$1 invested in prevention saves \$20 spent on treatment. Even more impressive is this statistic in relation to patients with diabetes.

The introduction of screening techniques for the early diagnosis of endocrinological diseases, the detection of complications of diabetes mellitus in the initial stages, in which treatment is most effective, allowed:

1. significantly reduce the leading cases of blindness from $2.1 \pm 0.1\%$ to $0.63 \pm 0.05\%$;
2. stabilize the indicator of the number of patients without manifestations of uremia at the level of $3.4 \pm 0.1\%$;
3. reduce the need for hospitalization by 2-3 times;
4. to achieve economic efficiency in the prevention of amputations - 2517 u.u. per patient per year.

In the case of patients with diabetes, spreading the ideology of correct behavior in favor of compensating for the disease is a strategic task for doctors and nurses.

Important tasks of a nurse in training in the "School of Diabetes" are:

1. motivation for independent development in patients with diabetes mellitus of volitional and practical skills to comply with the restrictions defined by the disease without tearing;

2. development of interest in the knowledge gained.

Innovative aspects in the work of the "School of Diabetes" are:

1. Changes in the organization of the educational process and the possibility of distance learning: the use of non-traditional forms of presentation of the material, the formation of problematic issues of diabetology, the joint search for solutions to individual or typical problems, the stimulation of the cognitive activity of students to take personal responsibility for health through the transformation of the internal and external world.

The task of the nurse is to turn the patient into her ally, like-minded person. This is possible and achieved after training the patient with diabetes mellitus is the basic rules of conduct, useful for compensating and minimizing the negative impact of the disease.

Rules include:

- 1) elimination of bad habits - smoking, drinking alcohol;
- 2) systematization of habitual walks and the acquisition of new habits - regular physical exertion;

- 3) changes in the ratios of the main components of food;

- 4) independent control of diabetes, which is built on the basis of the following principles:

1. regular measurements of blood glucose;

2. competent assessment of the obtained indicators;

3. the ability to change their treatment in accordance with the result.

Conclusions:

1. The disease of the endocrine system - diabetes mellitus, features of its classification, diagnosis, clinical picture and treatment - has been studied.
2. The features of the occurrence and course of diabetes mellitus in childhood and adolescence are investigated.
3. The features of diabetes mellitus in adults and the elderly have been determined.
4. The features of diabetes mellitus in pregnant women have been investigated.
5. The features of the nurse's work for the effective prevention and management of diabetes mellitus of the 1st and 2nd type are studied.

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