

## ОГЛЯДИ

### MEDICAL MANAGEMENT AND TREATMENT OF DIABETIC PATIENTS ON OUTPATIENT BASIS\*

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Medical management of diabetic patients on out patients' basis is indispensable for their survival and good quality of life, because, as we know, diabetes mellitus is a chronic disease and causes acute and chronic complications, so, we are obliged to treat it correctly for the entire life [1–4].

In this article we will discuss the main problems and topics that are necessary to do and to resolve the diabetics and medical staff, in order to assure a good control, and of course a good treatment of diabetes on out patients.

#### ***Endocrine Visits***

Endocrine visits are very important for «normal» course of diabetes. It is very important to have the sincere and friendly relationships among diabetic patients and medical teams, especially among diabetic patients and their endocrinologists. A «normal» course of diabetes from these sincere and friendly relationships is created.

As a rule, the diabetic patient must go for a visit to the endocrinologist at least every

three months. That is mainly caused by the need to perform HbA1c test, that is made each three months [4, 5]. When diabetes remains not in equilibrium, the diabetic patients ought to go to endocrinologist more frequently.

When a diabetic patient has another disease or diseases, he (she) is obliged to go to respective specialist or specialists for treatment of another disease or diseases [6, 7].

#### ***Glycemia***

The measurement of glycemia must be done immediately with glucometer (electronic device) when diabetic patient demonstrates signs of hypoglycemia or hyperglycemia. Glycemia should be measured before and after main meal, and at midnight, too, in order to correct doses of medicament(s) that are used to treat diabetes, and to correct diabetic diet as well (7–9).

When a diabetic patient suddenly has palpitations, tachycardia, tremor, anxiety, profuse sweating, feeling of a hunger, paresthesias, convulsions, vision problems, weakness, loose of conscience and mental confusion, it is the

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evidence of hypoglycemia development. In these cases, glycemia should be measured immediately with the use of glucometer; glycemia in this cases is usually less than 70 mg/dl, frequently less than 50 mg/dl [6, 7]. In this case, the diabetic patient has hypoglycemia, and must take a cake, or any other sweet meal orally [2, 3]. When the diabetic patient demonstrates gradual drying of mouth, frequent urination, thirst or weakness, he (she) ought to measure glycemia with glucometer immediately, because these signs are highly suggestive of hyperglycemia. In this case the glycemia is more than 300 mg/dl. The diabetic patient should inject an extra dose of rapid action insulin, or short action insulin intramuscularly [4, 5].

### ***Glycated Hemoglobin (HbA1c)***

Glycated hemoglobin (HbA1c) shows mean «memorial glycemia» within three months period. The measurement of HbA1c shows the degree of diabetes compensation for the previous three months. The efficacy of applied treatment of diabetes is estimated by this test for period of this time [6–8]. When HbA1c is high, that means diabetes over previous three months was not compensated, and the endocrinologist will increase doses of medicaments used for treatment of diabetes, and will also correct a diet. Glycated hemoglobin should be measured every three months [5–8].

### ***Lipids and Lipoproteins***

As we know, dyslipidemia (hyperlipidemia) in type 2 diabetes is present in about 30–40 % of patients, especially when patients are obese or overweight [3, 10, 11]. It is well known, too, that high level of lipids and lipoproteins in the blood is the key factor in the development of diabetic macroangiopathy (diabetic atherosclerosis) [4, 12]. Diabetic macroangiopathy clinically manifests with atherosclerosis of coronary, cerebral and lower extremities arteries, mainly with acute myocardial infarction, stroke and diabetic foot (diabetic gangrene) [4–6, 12]. Many authors recommend to measure the levels lipids and lipoproteins annually [4, 5, 10]. In case of diabetic patient had acute myocardial infarction, stroke or diabetic gangrene, the measurement of lipids and lipoproteins should be done every three months [10, 11, 13].

### ***Microalbuminuria and Albuminuria (Macroalbuminuria)***

It is well known that diabetic nephropathy is a very serious chronic complication of diabetes type 1 and type 2. This complication begins with excretion of albumin with urine. At first, the amount of excreted albumin by urine is small, 30.0-300.0 mg/24-hours, so it appears as microalbuminuria [6, 7, 14].

Later the damage of glomerules is increased; in such patients the amount of excreted albumin is 300.0 mg /24-hours, or more, so it appears as albuminuria (macroalbuminuria) [14]. Diabetic patients without diabetic nephropathy, have to measure albuminuria or microalbuminuria every six months to twelve months [5, 12, 14] to discover it, as soon as possible, and preferably to discover it in the stage of microalbuminuria [7, 14].

### ***Azothemia, Creatininemia and Clearance of Creatinine***

Azothemia, creatininemia and clearance of creatinine, are the main indices of glomerular function of kidneys. In patients with diabetic nephropathy (with albuminuria), the increase of level of azothemia, creatininemia, and the decrease of clearance of creatinine, may occur several months or years later after appearance of diabetic nephropathy [4, 7, 14, 15]. In these cases, patients have diabetic nephropathy with chronic renal disease (chronic renal failure) and should be treated by nephrologist, in cooperation with endocrinologist. In the stage without chronic renal disease, albuminuria, azothemia, creatininemia and clearance of creatinine, should be measured every six to twelve months [5, 12, 15]. When chronic renal disease is present, the frequency of measurement of azothemia, creatininemia, and clearance of creatinine is determined by nephrologist.

### ***Urine Analysis, Specimen Collection and Processing; Antimicrobial Susceptibility Testing***

Diabetes can be complicated with infections of urinary tract, because the presence of glucose in urine makes possible the appearance of these infections [2–4]. It is necessary, every six to twelve months for the diabetic patient to make urinary analysis to discover urinary

tract infections in stage without signs and symptoms of these infections [3, 5, 12]. At this stage, urinary infection manifests only by presence of leucocytes in urine [6, 7]. When diabetic patients have dysuria (burning sensation during urination) and increase of frequency of urination, they are obliged to do urine analyses as soon as possible. In these cases, many leucocytes and leucocyte cylinders can be found in urine of such patients [7, 8, 14].

The diabetic patients with urinary infections are obliged to do specimen collection and processing analysis to discover the microbe that has caused urinary infection, and antimicrobial susceptibility testing in order to discover the right antibiotic or antibiotics for the treatment of these infections [5, 7, 16]. The diabetic patients with urinary tract infections are treated by nephrologist, in cooperation with endocrinologist. The frequency of mentioned above examinations is determined by nephrologist.

### ***Complete Blood Count***

All diabetics should to complete blood count analysis annually [5, 12]. This analysis is necessary to discover secondary anemia, as a result of diabetic nephropathy or another etiology [2, 3, 16]. The increase of leukocytes and/or ESR, and left deviation of the leukocyte formula give us data about concomitant miscellaneous infections.

### ***Proteinogram and electrophoresis of proteins***

The diabetic patients should undergo measurement of total proteins and their components in the blood (proteinogram and electrophoresis of proteins), because many patients have disturbances of protein metabolism. These disturbances are caused by diabetes, or may be initiated by other miscellaneous causes [5, 7, 8]. Therefore, every diabetic patient should have his proteinogram and electrophoresis of proteins done every twelve months, to discover possible disorders of protein metabolism [7, 8].

### ***Body Weight***

Body weight is a very important issue for diabetic patients, because about 40–60 % type 2 diabetes patients were or are obese or overweight. On the other hand, many diabetics with

type 1 diabetes patients are underweight [6–8]. The correction of body weight is done with diet and physical exercises.

A hypocaloric diet is recommended for overweight and obese diabetics, while underweight patients are recommended to have hypercaloric diabetic diet [2, 7].

### ***The Fundus of Eye (Fundus Oculi)***

It is necessary to know that diabetic retinopathy is the primary cause among all eye diseases that lead to the blinding in proliferative stage [2, 4, 17, 18]. There are two grades of diabetic retinopathy: pre-proliferative retinopathy and proliferative retinopathy [4, 7, 12, 17, 18]. The examination of fundus of eye should be done every twelve months in order to discover initial changes of diabetic retinopathy [12, 16, 17]. When patient has proliferative retinopathy, the frequency of eye fundus examination is determined by ophthalmologist.

### ***Nerve conduction study and autonomic neuropathy***

The peripheral diabetic polyneuropathy is a common chronic complication of diabetes. This complication sometimes in type 2 diabetes may be appeared in stage of prediabetes, and diabetics are diagnosed with this complication [7, 8, 12, 19, 20]. It is recommended that nerve conduction studies have to be done every twelve months, in order to discover this complication at early stage [5, 19, 21]. For patients with peripheral diabetic neuropathy, the frequency of these tests, to evaluate the course of polyneuropathy is determined by neurologist. In cases when patients have autonomic neuropathy, that presents with disorders of other body organs, patients should be consulted time after time by neurologist and other specialists.

### ***The examination of lower extremities***

The examination of lower extremities is necessary in order to timely discover the presence of diabetic foot, and/or peripheral diabetic neuropathy. Diabetic foot includes many disorders of the foot: fissura, ragades, calluses, trophic ulcers, damages of peripheral and autonomic nerves, dry and wet gangrene [4, 5, 20, 21]. In every medical visit is indispensable to pull of patient's stockings in order to see elements of

diabetic foot, and to touch pulsations of dorsalis pedis and tibialis posterior arteries, in order to discover in the right time arterial damages of the feet. When the pulsations of dorsalis pedis and/or tibialis posterior arteries are not present, or these pulsations are subtle, it is indispensable to do angio CT, in order to diagnose atherosclerotic damages of these arteries. It is necessary to do sensitivity tests with diapason or monofilament, in order to discover the presence of sensitive peripheral neuropathy, and to do motor tests with neurologist hammer, in order to discover the presence of motor peripheral neuropathy [6, 7, 20, 21]. Every diabetic patient has to do electroneurogram (ENG) every year, in order to discover diabetic neuropathy or polyneuropathy at early stage.

### ***Electrocardiogram (E C G)***

Electrocardiogram is yet a very important examination, because it informs, the diabetic patient and medical staff about ischemic heart disease, disturbances of cardiac rhythm and conduction, or about other specific changes typical for other cardiac diseases [2, 3, 12]. Every diabetic patient has to do electrocardiogram every twelve months [5, 12, 13]. If the diabetic patient has had acute myocardial infarction in the past, electrocardiogram should be done every three months [4, 8, 13].

### ***Arterial Blood Pressure***

As we know, high arterial blood pressure is very frequent in diabetics, especially in type 2 diabetes. Many authors have found high arterial blood pressure in 30-40 % of patients with type 2 diabetes [2, 3, 8, 13].

Every diabetic patient should have a special device in order to measure arterial blood pressure frequently. In cases when diabetic patient has arterial hypertension, he ought to measure arterial pressure every two or three time a week [2, 6, 7]. When diabetic patient does not know that he suffers from arterial hypertension, and arterial pressure is 140/90 mmHg or more, in reality he (she) has arterial hypertension and must seek medical advice.

### ***The Smoking***

It is well known that the smoking accelerates and aggravates the process of atherosclero-

sis. The smoking is very harmful for diabetics, particularly for those with high blood pressure and/or chronic macrovascular (atherosclerotic) diabetic complications mentioned above [2, 5, 6, 8, 12]. Smoking cessation is necessary for diabetic patients.

### ***The treatment of miscellaneous diseases***

The diabetics may become sick with miscellaneous disease during their life. In these cases, the diabetics must refer to respective specialist, because each disease disorder diabetes, that is expressed with hyperglycemia [3, 6, 8]. For diabetics there are not absolutely prohibited medicaments, when these medicaments are absolutely necessary for another concomitant disease or diseases. In these cases, the endocrinologist must modify the treatment of diabetes in the aspect of diet and medicaments, in order to compensate diabetes, that is uncompensated due to concomitant disease (diseases) and its treatment.

### ***Diabetes Mellitus and Pregnancy-Gestational Diabetes Mellitus***

Diabetes mellitus and pregnancy is a situation when a woman suffers from diabetes mellitus before pregnancy, while gestational diabetes mellitus is a situation when diabetes, impaired glucose tolerance (IGT) or impaired fasting glycemia (IGF) are expressed during pregnancy, or when diabetes is unknown before pregnancy, and is discovered during pregnancy. Gestational diabetes mellitus disappears after delivery [3, 4, 9, 22, 23]. Women with diabetes mellitus and with gestational diabetes mellitus are treated by endocrinologist and obstetrician-gynecologist at the same time: endocrinologist treats diabetes, while obstetrician-gynecologist supervises the course of pregnancy and possible pathology of pregnancy. All endocrinologists insist that a diabetic woman has to become pregnant when diabetes is compensated only. Diabetes also should be compensated during the course of pregnancy. If diabetes is not compensated, baby is born big or small, and in some cases, the baby might have congenital defects [6, 22, 23]. The treatment of a women with diabetes, or with gestational diabetes must be done with insulin only, because the treatment with antidiabetic drugs can cause defects of fe-

tus [2, 8, 22, 23]. Pregnant women with diabetes or gestational diabetes must be treated by endocrinologist and obstetrician-gynecologist: the endocrinologist treats diabetes, impaired glucose tolerance (IGT), or impaired fasting glycemia (IFG), while obstetrician-gynecologist treats pregnancy: woman (mother) and fetus.

### ***Diabetes Mellitus In Children and Teenagers***

Overwhelming majority of children and teen-agers has type 1 diabetes. These diabetics are treated with insulin only, all the life [8, 24]. Since many years ago, firstly in the USA, and later in the Western Europe are diagnosed children and teenagers with type 2 diabetes [8, 24]. In many children and teenagers with type 2 diabetes are seen microvascular, macrovascular and neurologic complications in the time of diagnosis of diabetes, as it happen in adults with type 2 diabetes. These complications were appeared and were developed during impaired glucose tolerance (IGT) and/or in impaired fasting glycemia (IFG), namely during prediabetes stage [8, 24]. The children and teen-agers with diabetes type 2 usually are treated with antidiabetic drugs, but in some circumstances they may be treated with antidiabetic drugs and insulin, or insulin only: temporarily or permanently, as adult diabetics with type 2 diabetes. The children and teenagers with obesity must go to pediatric endocrinologist, in order to diagnose diabetes type 2 as soon as possible and to treat it. Early diagnosis and perfect treatment of diabetes are indispensable to prevent, to reduce the frequency of chronic complications, or to postpone them as much as possible. Perfect treatment of diabetes makes possible to have less severe complications in comparison with diabetics treated badly.

### ***Diabetic Patient Education***

Diabetic patient education is an integral part of diabetes treatment. By this education,

the diabetics learn necessary knowledge about diabetes: the causes of the disease, the main signs and symptoms, acute and chronic complications, especially, self control and self treatment of this disease [5, 12, 25]. Other elements of diabetic patient education are discussions on diabetes mellitus by radio and/or by television; by medical articles on diabetes mellitus, published in medical magazines and in miscellaneous newspapers; by diabetes workshops, and by diabetes books or bucklets [5, 12, 25]. It is necessary to know that patient education has to be simple and understanding language, in order to be useful for people with diabetes

In endocrine clinic of University Hospital Center «Mother Teresa» in Tirana, since 1985 and until now, there is a class room where patient education of diabetic patients was made. The educators were trained in diabetic teaching unit of University Hospital Geneva (Switzerland) in 1984.

### ***Diabetic Associations***

Diabetic associations are non-governmental organizations of diabetics and medical staff, or organizations of diabetic patients only. These organizations are created to ameliorate the quality of life of diabetics: for diabetic patient educations, for medical control and treatment of diabetics at home conditions, and to protect diabetics interests. These associations have to collaborate with government and have to be helped by government and by non-governmental associations financially. The diabetic associations have to help diabetics to assure necessary medicaments and other tools, firstly electronic devices and strips to measure glycemia at home conditions for self-control and self treatment of diabetes. Diabetics have to be felt equal with other people without diabetes, not to have inferiority complexes. They have to engage completely in everyday work, equally with people without diabetes, in all social activities [26, 27].

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In this article are developed endocrine visits and necessary medical examinations and analyses: glycemia, glyated hemoglobin (HbA1c), lipids and lipoproteins, micro and macroalbuminuria, azothemia, creatininemia and clearance of creatinine, urine analysis, specimen collection and processing analysis and antimicrobial susceptibility testing, peripheral blood count, proteinogram (proteins in the blood) and electrophoresis of proteins.

In this article are developed also: fundus oculi, body weight, tests of nervous speed conduction, examination of lower extremities, ECG, blood pressure, treatment of miscellaneous diseases, smoking, diabetes mellitus and pregnancy – gestational diabetes, diabetes mellitus in children and teenagers, diabetic patient education and diabetic associations.

Key words: diabetes mellitus, glycemia, glyated hemoglobin, lipids and lipoproteins, fundus oculi.

## МЕДИЦИНСКОЕ И АМБУЛАТОРНОЕ ЛЕЧЕНИЕ БОЛЬНЫХ С САХАРНЫМ ДИАБЕТОМ

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В этой статье исследуются посещения больными эндокринологов, график медицинских осмотров и сдачи анализов: гликемия, гликированный гемоглобин (HbA1c), липиды и липопротеины, микро- и макроальбинурия, азотемия, креатининемия и клиренс креатинина, анализ мочи, анализ на наличие сперматозоидов и тестирование на антимикробную чувствительность, периферический анализ крови, протеинограмма (белки в крови) и электрофорез белков.

В этой статье исследуются также: глазное дно, масса тела, тесты скорости нервной проводимости, исследование нижних конечностей, ЭКГ, артериальное давление, лечение разных заболеваний, курение, сахарный диабет и беременность - гестационный диабет, сахарный диабет у детей и подростков, диабетическое образование пациентов и диабетические ассоциации.

Ключевые слова: сахарный диабет, гликемия, гликированный гемоглобин, липиды и липопротеины, глазное дно.

## МЕДИЧНЕ І АМБУЛАТОРНЕ ЛІКУВАННЯ ХВОРИХ НА ЦУКРОВИЙ ДІАБЕТ

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У даній статті досліджуються відвідування хворими ендокринологів, графік медичних оглядів і здачі аналізів: глікемія, глікований гемоглобін (HbA1c), ліпіди і ліпопротеїни, мікро- і макроальбумінурія, азотемія, креатинінемія і кліренс креатиніну, аналіз сечі, аналіз на наявність сперматозоїдів і тестування на антимікробну чутливість, периферичний аналіз крові, протеїнограма (білки в крові) і електрофорез білків.

У даній статті досліджуються також: очне дно, маса тіла, тести швидкості нервової провідності, дослідження нижніх кінцівок, ЕКГ, артеріальний тиск, лікування різних захворювань, паління, цукровий діабет і вагітність - гестаційний діабет, цукровий діабет у дітей та підлітків, діабетична освіта пацієнтів і діабетичні асоціації.

Ключові слова: цукровий діабет, глікемія, глікований гемоглобін, ліпіди і ліпопротеїни, очне дно.