GEORGIAN MEDICAL NEWS

ISSN 1512-0112

No 4 (301) Апрель 2020

ТБИЛИСИ - NEW YORK

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

ნოდ მომატებულია ინსულინის (შაქრიანი დიაბეტი ტიპი 1-ის შემთხვევაში – 38.5%-ით, შაქრიანი დიაბეტი ტიპი 2-ის შემთხვევაში – 55.6%-ით), ლეპტინის (შაქრიანი დიაბეტი ტიპი 1-ის შემთხვევაში – 43.8%-ით, შაქრიანი დიაბეტი ტიპი 2-ის შემთხვევაში –53.7%-ით), ოსტეოკალცინონინის (მხოლოდ შაქრიანი დიაბეტი ტიპი 1-ის შემთხვევაში - 53.9%-ით) დონე. იკვეთება პირდაპირი კორელაციური კავშირი სახსრების დაზიანების სიმძიმესა და ინსულინისა და ლეპტინის დონეებს შორის.

პაციენტებში დიაბეტური ართროპათიით სარწმუნოდ მომატებულია ინსულინის და ლეპტინის დონე. ართროპათიის სიმძიმის ხარისხი შაქრიანი დიაბეტი ტიპი 2-ის დროს პირდაპირ კორელირებს ინსულინორეზისტენტობის მაჩვენებლებთან. პაციენტებში დიაბეტ-ასოცირებული ოსტეოართრიტებით მომატებულია კატაბოლიზმის მახასიათებლის მაჩვენებლები შემაერთებელ ქსოვილში (თავისუფალი ჰიდროქსიპროლინი და კოლაგენაზა, p<0,001).

ართროპათიის აღმოჩენის შესაძლებლობა შაქრიანი დიაბეტი ტიპი 1-ის დროს ინსულინის დონის ზრდის შემთხვევაში იმატებს 3.8-ჯერ, ლეპტინის ზრდისას – 1.3-ჯერ, შაქრიანი დიაბეტი ტიპი 2-ის შემთხვევაში, შესაბამისად - 2.6-ჯერ და 1.2-ჯერ. დადგენილია, რომ ართროპათიის განვითარება არ არის დამოკიდებული შაქრიანი დიაბეტის ტიპზე. ქალებში შაქრიანი დიაბეტი ტიპი 2-ით ართროპათიის განვითარების საფრთხე 6.4-ჯერ მეტია, ვიდრე მამაკაცებში.

ამრიგად, შესაძლოა, ინსულინისა და ლეპტინის დონის მატება ჩაითვალოს ართროპათიის არსებობის და პროგრესირების მარკერად შაქრიანი დიაბეტით დაავადებულებში. ართროპათიის მქონე პაციენტებში მომატებულია ჰიდროქსიპროლინის და კოლაგენაზას დონე, რაც ასახავს კატაბოლური პროცესების გაძლიერებას შემაერთებელ ქსოვილში და შეიძლება წარმოადგენდეს სახსრის სტრუქტურების დაზიანების განვითარების ერთ-ერთ მექანიზმს შაქრიანი დიაბეტით დაავადებულებში.

COVID-19 IN DIABETES PATIENTS IN UKRAINE: LESSONS FOR DOCTORS AND PATIENTS

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World Health Organization recognized coronavirus disease 2019 (COVID-19) as a pandemic on 11 March 2020 [1]. As of 22 April 2020, 2,566,861 cases of COVID-19 have been reported worldwide, resulting in 177,802 deaths [2].

The first case of COVID-19 in Ukraine was diagnosed on 3 March 2020 in Chernivtsi and the first letal case was reported on 13 March 2020. As of 22 April 2020 6,592 cases of COVID-19 have been reported in Ukraine, among these cases 174 caused death (2.64% lethality), 143 patients (3.8% of cases) have recovered [2].

Age distribution of COVID-19 patients in Ukraine is in Fig. 1.

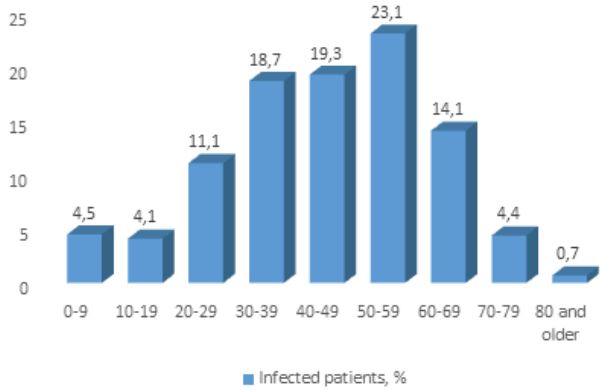

Fig. 1. Age distribution of COVID-19 patients in Ukraine (as of 3 April 2020) [2]

The feature of COVID-19 pandemics in Ukraine is that the age of patients is lower (50-59 years old, 40-49 years old and 30-39 years old) than in China and other European countries (Fig. 1). Another feature of COVID-19 epidemiology in Ukraine is that virus cause disease in women (56.0%) more often than in men (44.0%). But there are more male patients in other countries [2]. Although there are more male deaths (51.7%) than female (48.3%) in Ukraine. Deaths have occurred in 18-29 years old patients (1%), 30-49 years old patients (14%), in 50-69 years old patients (48%), in 70 y.o. and older patients (38%) [3]. 85% of all deaths were over 50 years of age. 79% of patients who died from COVID-19 had severe cardiovascular diseases, diabetes mellitus (DM), neoplasms, renal diseases, respiratory disorders and obesity. In total, comorbidities (one or several) have been cardiovascular diseases (74%), diabetes mellitus (22%), lungs diseases (9%), neoplasms (8%), renal diseases (7%) [3].

It has been published in Ukraine and all over the world that certain groups of patients have a risk of COVID-19 due to Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spreading. These are patients with arterial hypertension, cardiovascular diseases and diabetes mellitus. The main mentioned risk factors of COVID-19 are advanced age, arterial hypertension, diabetes mellitus, COPD, CVD and cerebrovascular disease [4]. Moreover, published data have differences which have to be analyzed properly.

A great part of diabetic patients take several drugs. The indications to some medication are discussed in case of COVID-19. Another problem for diabetic patients is restriction during quarantine: difficulties with obtaining medications and following the diet; no trainings for diabetic patients, which can lead to inadequate treatment and complications.

What conclusions can medical practitioners and diabetic patients do during the pandemics? We tried to give answers to this question in our investigation.

The purpose of this study was to analyze the epidemiological data, to investigate the causes of negative influence of diabetes mellitus on COVID-19 course and to make recommendations on prophylaxis and patients treatment in cases of COVID-19 and diabetes mellitus co-morbidity.

Material and methods. Electronic databases of MEDLINE and Google Scholar were searched using keyword searches. The search was limited to English-language literature. Keywords were COVID-19, diabetes mellitus, hyperglycemia, glycated hemoglobin, diabetic ketoacidosis. 129 publications were initially identified. Articles were published between December 2019 and 22 April 2020.

Results and discussion. At first we should answer the question: does diabetes mellitus co-morbidity increase the probability of COVID-19?

In 12 Chinese studies included 2108 patients with confirmed COVID-19 and mean age 49.6 years the prevalence of diabetes was 10.3% [5]. For comparison, total prevalence of diabetes in China in 2013 was 10.9% and the prevalence among people aged 40-59 years was 12.3% [6]. A similar situation is in Europe. In Padua, located at the center of an outbreak, among 146 hospitalized patients with confirmed SARS-CoV-2 infection and a mean age of 65.3 years, 13 had pre-existing diabetes (a prevalence was 8.9%) [5]. For comparison, the prevalence of diabetes in the same region in 2018 was 6.2% overall and 11.0% among people aged 55–75 years (mean 65) [7].

According to the meta-analysis, which included 76,993 patients, the pooled prevalence of diabetes in people infected with SARS-CoV-2 was 7.87% [8]. The data from other study, that show the prevalence of diabetes in COVID-19 patients, is in Table 1.

According to this analysis we can conclude that the prevalence of diabetes in COVID-19 patients corresponds to the prevalence of DM in certain regions and in the world. So the first main conclusion of this study is that diabetes mellitus co-morbidity does not increase the probability of development COVID-19 and diabetes is not the risk factor of COVID-19.

Thus, diabetes is not a verdict, diabetic patients can have COVID-19 with the same frequency as other people. But, are there any other dangers for this patients? We reviewed data on the to discover the influence of patient's condition, place of treatment and diabetes co-morbidity on the results of treatment.

Wu J, et al.(2020) described in their study, which included 280 cases of COVID-19, that significantly more patients from severe group had diabetes in comparison to mild group (33.73% vs 3.05%, P = 0,042) [22].

58% of patients in ICU had diabetes; all these patients had respiratory insufficiency and 75% of patients needed mechanical ventilation [16]. Wang A, et al. (2020) in their study published other data but the trend is the same: more ICU patients with COVID-19 had diabetes than in other departments (22.2% vs 5.9%) [23].

According to Fadini GP, et al. (2020) the prevalence of diabetes among 355 patients who died was 35.5%. In 2018 the prevalence of diabetes in Italy among people with the same age range and sex distribution was 20.3%. Thus, the rate ratio of diabetes among patients who died from SARS-CoV-2 infection compared to the general population was 1.75. The authors concluded that diabetes may not increase the risk of SARS-CoV-2 infection (we have agreed with this yet) but can worsen the outcome of this new coronavirus disease [10]. The other results of this analysis are described in Table 2.

Table 1. The prevalence of diabetes in COVID-19 patients

Authors	Country	Number of patients	Sex (male/ female)	Age	Diabetic patients (%)	Diabetic patients in region (%)
Wang D, et al. [9]	China	138	78/63	Median: 56 (42-68)	10,1%	≥9%[1]
Fadini GP, et al. [10]	Italy, Padua	146	-	Mean: 65,3	8,9%	11,0%[2]
Wang X., et al [11]	China	1012	524/488	Median: 50 (39-58)	2,7%	≥9%[1]
Fadini G.P., et al. [10]	China	2108	-	Mean: 49,6	10,3%	12,3%[3]
CDC COVID-19 Response Team [12]	USA	7162	-	-	10,9%	≥9%
Zhang JJ, et al. [13]	China	140	71/68	Median: 57 (25-87)	12,1%	10,9%[3]
Guan W.J., et al. [14]	China	1590	904/686	Mean: 48,9	8,2%	12,3%[3]
Wan S., et al. [15]	China	135	72/63	Median: 47 (36-55)	8,9%	10,9%[3]
Zhang MQ, et al. [16]	China	9	5/4	Median: 36 (15-49)	11,1%	10,9%[3]
Guan WJ, et al. [17]	China	1099	640/459	Median: 47 (25-87)	7,37%	10,9%[3]
Liu K, et al. [18]	China	137	61/76	Median: 57 (20-83)	10,22%	10,9%[3]

** - the prevalence of diabetes was investigated in certain region according to: 1 - WHO and "IDF Diabetes Atlas 2019" [19]; 2 - Longato E, et al. (2020) [20]; 3 - Wang L, et al.(2013) [21].*

Table 2. The prevalence of COVID-19 in diabetic patients due to condition severity and treatment results

Authors	Country	Number of patients	Age	Mild symptoms	Severe symptoms		Deaths
					non-ICU	ICU	
Fadini GP, et al. [10]	Italy	355	Mediana: 80,5 (31-103)	-	-	-	35,5%
CDC COVID-19 Response Team [24]	USA	7162		6%	24%	32%	
Bhatraju PK, et al. [25]	USA	24	64±18			58%	
Wu J, et al. [26]	China	280	43,12±19,02	3,05%		33,73%	
Leung C. [27]	China	46	70.6	-	-	-	26,2%
He XW, et al. [28]	China	54	Mediana: 68 (59,8, 74,3)		24,1% (severe or critical conditions)		
Zhou F, et al. [29]	China	191	Mediana: 56 (46,0-67,0)		14%		31%
Korean Society of Infectious Diseases [30]	Republic of Korea	54	Mediana: 75,5 (35-93)	-	-	-	29,6%
Wu C, et al. [31]	China	201	Mediana: 51 (43-60)	5,1%		19,0%	25,0%
Public Health Center [3]	Ukraine	98		-	-	-	22%
Deng SQ, et al. [32]	China	45		-	-	-	42,3%
Zhang JJ, et al. [33]	China	140	Mediana: 57 (25-87)	11,0%	13,8%		

The analysis of these data allows us to conclude that patients with severe course of COVID-19 had diabetes more often. Wu C., et al. [31] had next data: patients with mild course of disease had diabetes in 5.1% of cases, in 19% of ICU patients and in 25% of patients who died. Similar data was published in American study by CDC COVID-19 Response Team. The prevalence of diabetes in this study was 6% in mild group, 24% in non-ICU severe patients and 32% in ICU patients [24]. 22% of patients who died in Ukraine had diabetes [3], while total prevalence of diabetes in Ukraine according to WHO is 5-6% [19].

Thus, we can make second conclusion that previous diabetes can contribute the complications of COVID-19, patient's severe condition and can increase the mortality.

We should consider why the course of infection in diabetic patients is more severe and why are the results worse (while the incidence of COVID-19 is the same in diabetic patients and people without diabetes).

Let's discuss the mechanisms of this phenomenon.

The first reason is the features of autonomic innervation in diabetic patients. The severity of Covid-19 in diabetes may be hidden by an initial milder presentation of SARS-CoV-2 infection, with fewer patients experiencing fever, chill, chest tightness, and shortness of breath [34]. This phenomenon reminds silent symptoms of diabetes mellitus. The disorders of autonomic innervation of heart (cardiac hypoesthesia syndrome) leads to afferent autonomic nerve fibers injury. These fibers conduct nerve impulses which are connected with pain due to myocardial injury. That is why silent myocardial infarction is common in diabetic patients [35]. The same situation can take place in diabetic patients with COVID-19: patients do not pay much attention to their symptoms, which leads to inadequate treatment. As a result, treatment is delayed, complications develop, the outcome is worse.

Secondly, there is information that SARS-CoV-2 can lead to temporary dysfunction of pancreatic islets [36]. There is information that coronaviruses can entry in the human cells with help of dipeptidyl peptidase 4 (DPP-4). This protein takes part in insulin modulation, glucose metabolism and glucagon degradation (as GLP-1) [37,38]. Hyperglycemia in COVID-19 patients can be caused by this or similar mechanisms [39]. The question of the appropriateness of the administration of hypoglycemic drugs in the pandemic of COVID – Dipeptidyl Peptidase-4 Inhibitors has been actively discussed in the scientific literature and there is currently no data regarding the need to discontinue treatment with these drugs.

The third possible reason of disease course severity is an influence of some medications often used by diabetic patients, for example, ACE inhibitors. Angiotensin converting enzyme (ACE) is an important component of renin–angiotensin system (RAS), which facilitates amino acids transport. ACE-2 receptors have been recently identified as receptors for SARS-CoV-2, which provides important connection between immunity, inflammation and cardiovascular diseases [40]. Studies have shown that these medications upregulate the ACE-2 receptor, the very receptor that the SARS-CoV-2 virus uses to enter host cells [41]. Furthermore, the invasion of human alveolar epithelial cells with SARS-CoV-2 often leads to acute respiratory distress syndrome (ARDS), life threatening condition with bad prognosis for COVID-19 patients [42]. Moreover, it is shown that diabetes increases the expression of ACE-2 in experimental models [43, 44] and increased viral load can lead to severe course of COVID-19 in diabetic patients [45]. This can lead to complications in patients who have taken ACE-inhibitors. Some authors recommend changing ACE inhibitors and angiotensin receptor blockers to other drugs (for example, calcium channel blockers) in patients with COVID-19 and diabetes [46].

But there are other opinions too. American and Dutch investigators led by Danser AHJ, et al.(2020) think that ACE inhibi-

tors do not influence on ACE-2 because ACE and ACE-2 are different enzymes, thus, they cannot cause virus invasion [47]. There are no evidence based data that confirm that ACE inhibitors and angiotensin II type 1 receptor blocker administration facilitates coronavirus entry by increasing ACE2 expression [47]. Other scientists agree with this statement. Moreover, there are no information about the risk of other antihypertensive drugs consumption. Because of lack of evidence European Medicine Agency (EMA) advises do not interrupt the use of ACE inhibitors during COVID-19 pandemics [48].

Finally, diabetes is a risk factor for the progression and prognosis of COVID-19. Guo W, et al.(2020) found that COVID-19 patients without other comorbidities but with diabetes were at higher risk of severe pneumonia, release of tissue injury-related enzymes, excessive uncontrolled inflammation responses and hypercoagulable state associated with dysregulation of glucose metabolism [49]. Furthermore, serum levels of inflammation-related biomarkers such as IL-6, C-reactive protein, serum ferritin and coagulation index, D-dimer, were significantly higher ($P<0.01$) in diabetic patients compared with those without, suggesting that patients with diabetes are more susceptible to an inflammatory reactions leading to rapid deterioration of COVID-19 [49].

We should not forget that COVID-19 can influence on the diabetes progression too. According to Maddaloni E, Buzzetti R. (2020) the interaction between Covid-19 and diabetes could also be bi-directional, with SARS-CoV-2 potentially worsening preexisting diabetes or even predisposing to diabetes in non-diabetic subjects [34].

All mentioned mechanisms can explain the fact that course of COVID-19 in diabetic patients is more severe and has multiple complications and worse results of treatment.

What conclusions should doctors and patients with diabetes make during the COVID-19 pandemics? We think that it is necessary to make recommendations on prophylaxis and management of patients in cases of COVID-19 and diabetes mellitus comorbidity according to modern international data [34, 50, 51].

Specific measures of prophylaxis of COVID-19 in patients with diabetes:

1. Maintaining social distancing and staying at home are the most widespread recommendations in European countries and in while world. People with diabetes should strictly follow these measures and avoid contacts with relatives and friends because of high possibility of COVID-19.
2. It is important that people with diabetes maintain a good glycemic control, as it might help in reducing the risk of infection and also the severity. More frequent monitoring of blood glucose levels (with use of self-monitoring blood glucose) is required Good glycemic control may decrease chances of superadded bacterial pneumonia.
3. Patients with diabetes and co-existing heart disease or kidney disease need special care and attempts should be made to stabilize their cardiac/renal status by controlling BP and HR. Patients should continue to use antihypertensive drugs, for example ACE inhibitors (the recommendation can change according to WHO).
4. Attention to nutrition and adequate protein intake is important. Any deficiencies of minerals and vitamins need to be corrected. Delivery of food and drugs should be organized during quarantine.
5. Exercise has been shown to improve immunity, though it might be prudent to be careful and avoid crowded places like gym or swimming pools. Patients with diabetes should do exercise regularly at home during quarantine.
6. It is important to take influenza and pneumonia vaccinations. These may decrease chances of secondary bacterial pneumonia after respiratory viral infection [50].
7. Patients should be in contact with endocrinologist (in case of diabetes mellitus, type 1) or general practitioner (in case of diabetes mellitus, type 2). Face-to-face meeting in hospitals are not recommended to diabetic patients because of crowding.
8. We recommend to use phone calls, video-calls, e-mails to maintain the contact with medical team for disease controlling.
9. Patients with diabetes are recommended to plan their actions in case of COVID-19. It is important to have enough means for frequent monitoring of blood glucose at home.

Specific measures after infection and for the treatment of COVID-19 in patients with diabetes at home:

1. If a person with diabetes has a fever, cough, nasal congestion or shortness of breath, the appropriate health authority (primarily a family doctor) must be informed, because testing for this disease is only available at selected locations.
2. It is important not to underestimate the severity of COVID-19 in patients with diabetes, even if classic signs and symptoms of the disease are absent, because of atypical clinical findings, which are often observed in patients with diabetes [34].
3. The affected person should be isolated for 14 days or until symptoms have resolved (whichever is longer). The recommendations adopted in the country must be followed.
4. Most of patients have mild illnesses and can be treated at home. In such cases, most of the mentioned guidelines are appropriate during quarantine.
5. Affected people should be placed in a well-ventilated single room while family members should be in another room or, if not possible, maintain a distance of at least one meter from the affected person (e.g., sleep in a separate bed) and perform hand hygiene (washing hands with soap) after any contact with the affected person or their immediate surroundings.
6. Patients with diabetes should strictly maintain adequate hydration (drink plenty of fluid) and undergo symptomatic treatment with acetaminophen etc.
7. Patients with type 1 diabetes should frequently measure blood glucose and urinary ketones if fever and hyperglycemia occurs. Frequent changes in dosage and correction bolus may be required to maintain normoglycemia.
8. Anti-hyperglycemic agents that may cause hypovolemia or hypoglycemia should be avoided. The dosage of oral anti-diabetic drugs may need to be reduced. Patients should follow daily patient's instructions and may need more frequent monitoring of blood glucose and medication adjustments. It should be kept in mind that patients who use glycemic measurements using a system of continuous glucose monitoring may have wrong results while using of non-steroidal anti-inflammatory drugs (paracetamol), so it should be guided by the glycemic index obtained with the glucometer.
10. It should be remembered that decompensation of carbohydrates metabolism may suddenly develop in patients with diabetes and COVID-19.
11. For the timely correction of the treatment program, you must have the necessary phones of a personal physician and an endocrinologist. Make regular video calls if possible.

Features of management of hospitalized patients with diabetes and COVID-19

1. Hospitalized patients with severe disease require frequent monitoring of blood glucose levels.
2. The examination should include a set of laboratory tests that include carbohydrate metabolism (blood glucose, glycated hemoglobin, urine glucose, etc.), renal and liver function panels, electrolytes serum level, arterial blood gases.
3. It is important to carefully monitor blood pressure, heart rate,

ECG, as the patient's condition may worsen unexpectedly and suddenly due to hypotension, arrhythmia, or electrolyte disorders which are common to diabetes.
4. All indicators of monitoring, the water balance (drunk and infused intravenously) should be carefully recorded in patients cards. The results of all laboratory, biochemical and instrumental studies are carefully recorded there as well.
5. If hypovolemia is possible, oral agents such as selective sodium-glucose transporter-2 inhibitors should not be used, as in this case the risk of developing diabetic ketoacidosis may be increased and metformin should be stopped in order not to provoke the development of lactate-acidosis. In case of severe condition and impairment of consciousness it is obligatory to switch to insulin.
6. Insulin is the best way to control hyperglycemia in hospitalized patients. Furthermore, insulin is not only good for correction of hyperglycemia but there are no data about its negative influence in COVID-19 patients [52].
7. The best way of insulin administration during decompensation of carbohydrates metabolism is intravenous infusion by syringe pump.
8. Management of patients should be performed according to modern guidelines on treatment of diabetes mellitus, for example, American Diabetes Association Standards of Medical Care in Diabetes [53].
9. Monitoring and treatment of decompensation of diabetes should be strictly performed. We recommend using guidelines American Association of Clinical Endocrinologists and American College of Endocrinology Protocol for standardized production of clinical practice guidelines, algorithms, and checklists, Self-management of diabetes in hospital: a guideline from the Joint British Diabetes Societies (JBDS) for Inpatient Care group and clinical reviews [54-56].

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SUMMARY

COVID-19 IN DIABETES PATIENTS IN UKRAINE: LESSONS FOR DOCTORS AND PATIENTS

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World Health Organization recognized coronavirus disease 2019 (COVID-19) as a pandemic on 11 March 2020. The first case of COVID-19 in Ukraine was confirmed on 3 March 2020 in Chernivtsi and the first lethal case was reported on 13 March 2020. As of 22 April 2020 6592 cases of COVID-19 have been reported in Ukraine, among these cases 174 caused death (2.64% lethality), 467 patients (7.08% of cases) have recovered. The feature of COVID-19 pandemics in Ukraine is that the age of patients is lower (50-59 years old, 40-49 years old and 30-39 years old) than in China and other European countries. Another feature of COVID-19 epidemiology in Ukraine is that virus cause disease in women (56.0%) more often than in men (44.0%). But there are more male patients in other countries. Although there are more male deaths (51.7%) than female (48.3%) in Ukraine. Deaths have occurred in 30-49 years old patients (14%), in 50-69 years old patients (48%), in 70 years old and older patients (38%). 85% of all deaths were over 50 years of age. 79% of patients who died from COVID-19 had severe cardiovascular diseases, diabetes mellitus, neoplasms, renal diseases, respiratory disorders and obesity. In total, co-morbidities (one or several) have been cardiovascular diseases (74%), diabetes mellitus (22%), lungs diseases (9%), neoplasms (8%), renal diseases (7%). In this article we analyzed epidemiology and causes of negative influence of diabetes mellitus on COVID-19 progress in world and Ukraine. We also made recommendations on prophylaxis and patients treatment in cases of COVID-19 and diabetes mellitus co-morbidity.

Keywords: COVID-19, diabetes mellitus, complication, prophylaxis, treatment.

РЕЗЮМЕ

COVID 19 У БОЛЬНЫХ САХАРНЫМ ДИАБЕТОМ В УКРАИНЕ: УРОКИ ПАНДЕМИИ ДЛЯ ВРАЧЕЙ И ПАЦИЕНТОВ

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11 марта 2020 Всемирная организация здравоохранения объявила коронавирусную болезнь 2019 (COVID-19) пандемией. В Украине COVID-19 впервые был диагностирован 3 марта 2020 в Черновцах, и уже 13 марта был зафиксирован первый летальный случай в результате коронавирусной инфекции. На 22 апреля 2020 в Украине насчитывалось 6592 случая заболевания, из них 174 летальных (летальность - 2,64%), выздоровели - 467 пациентов (7,08% от всех заболевших). Особенностью распространения COVID-19 в Украине является то, что наиболее часто подвержены заражению вирусом пациенты в более молодом возрасте (50-59 лет, 40-49 и 30-39 лет), чем в Китае и странах Европы. Еще одной особенностью распространения COVID-19 в Украине является более частое поражение женщин, чем мужчин: 56,0% против 44,0%, соответственно, в то время как в других странах чаще болеют мужчины. Однако среди летальных случаев в Украине преобладают мужчины - 51,7% против 48,3%. По возрастным показателям летальные случаи распределились следующим образом: 30-49 лет - 14%, 50-69 лет - 48%, 70 и старше - 38%. В общем, среди умерших преобладают лица старше 50 лет (85%). Из всех умерших от COVID-19 в Украине 79% больных имели тяжелые сердечно-сосудистые заболевания, сахарный диабет, новообразования, заболевания почек, легких и ожирения. В целом доля болезней составила (одна или несколько): сердечно-сосудистые заболевания - 74%, сахарный диабет - 22%, заболевания легких - 9%, новообразования - 8%, заболевания почек - 7%. В статье проанализированы эпидемиологические данные и причины негативного влияния сахарного диабета на возникновение и развитие коронаровируснои болезни (COVID-19) в мире и Украине и сформулированы рекомендации по профилактике и лечению больных в случае сочетания инфекции с сопутствующим сахарным диабетом.

რეზიუმე

COVID 19 შაქრიანი დიაბეტით დაავადებულებში უკრაინაში: პანდემიის გაკვეთილები ექიმებისა და პაციენტებისათვის

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2020 წლის 11 მარტს ჯანმრთელობის მსოფლიო ორგანიზაციამ კორონავირუსული დაავადება (COV-

ID-19) გამოაცხადა პანდემიად. უკრაინაში COVID-19 პირველად დიაგნოსტირებულ იქნა 2020 წლის 3 მარტს ჩერნოვციში, 13 მარტს კი უკვე კორონავირუსული ინფექციის მიზეზით დაფიქსირდა პირველი ლეტალური შემთხვევა. 2020 წლის 22 აპრილისათვის უკრაინაში ირიცხებოდა დაავადების 6592 შემთხვევა, მათგან 174 - ლეტალური (ლეტალობა – 2.64%), გამოჯანმრთელდა 467 პაციენტი (დაავადებულთა 7.08%). COVID-19-ის გავრცელების თავისებურებას უკრაინაში წარმოადგენს ის, რომ ვირუსით ინფიცირებას ყველაზე ხშირად ექვემდებარება უფრო ახალგაზრდა ასაკის პაციენტები (50-59 წლის, 40-49 წლის და 30-39 წლის), ვიდრე ჩინეთსა და ევროპის ქვეყნებში. უკრაინაში მის კიდევ ერთ თავისებურებას წარმოადგენს, რომ ვირუსი უფრო მეტად აზიანებს ქალებს, ვიდრე მამაკაცებს: 56.0% vs. 44.0%, შესაბამისად; სხვა ქვეყნებში უფრო ხშირად ავადდებიან მამაკაცები. თუმცა, ლეტალურ შემთხვევათა შორის უკრაინაში სჭარბობენ მამაკაცები – 51.7% vs.48.3%. ასაკობრივი მაჩვენებლების მიხედვით ლეტალური შემთხვევები განაწილდა შემდეგნაირად: 30-49 წელი - 14%, 50-69 წელი - 48%, 70 წელი და მეტი - 38%. მთლიანობაში, გარდაცვლილთა შორის სჭარბობენ 50 წელზე მეტი ასაკის პირები (85%). COVID-19-ით გარდაცვლილთაგან უკრაინაში 79%-ს ჰქონდა გულ-სისხლძარღვთა დაავადებები, შაქრიანი დიაბეტი, ახალწარმონაქმნები, თირკმლების და ფილტვების დაავადებები, სიმსუქნე. მთლიანობაში დაავადებების წილი (ერთი ან რამდენიმე) ასეთი იყო: გულ-სისხლძარღვთა დაავადებები – 74%, შაქრიანი დიაბეტი – 22%, ფილტვების დაავადებები – 9%, ახალწარმონაქმნები – 8%, თირკმლების დაავადებები – 7%.

სტატიაში გაანალიზებულია შაქრიანი დიაბეტის უარყოფითი გავლენის ეპიდემიოლოგიური მონაცემები და მიზეზები კორონავირუსული დაავადების აღმოცენებასა და განვითარებაზე მსოფლიოსა და უკრაინაში, ჩამოყალიბებულია რეკომენდაციები პაციენტთა პროფილაქტიკისა და მკურნალობისათვის ინფექციის შერწყმის შემთხვევაში თანმხლებ შაქრიან დიაბეტთან.

АНАЛИЗ КОРРЕЛЯЦИИ КЛИНИКО-ЛАБОРАТОРНЫХ И ИНСТРУМЕНТАЛЬНЫХ ПОКАЗАТЕЛЕЙ ПОРАЖЕНИЯ СЕРДЦА У МОЛОДЫХ БОЛЬНЫХ С ОСТРЫМ ПОСТСТРЕПТОКОККОВЫМ ГЛОМЕРУЛОНЕФРИТОМ И РЕНОКАРДИАЛЬНЫМ СИНДРОМОМ

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Острое нарушение функций почек встречается при остром постстрептококковом гломерулонефрите (ОПСГН), осложненным острым почечным повреждением (ОПП) [2,16,18]. Результатами многочисленных исследований доказано, что у молодых ОПСГН развивается спустя 7-21 день после тонзиллита, фарингита, или стрептодермии [1,8,11]. Основное клиническое проявление ОПСГН - это остронефритический синдром (ОНС) (отеки, гипертония, гематурия), который может осложниться ОПП [9,12,13].

В литературе имеются малочисленные публикации, касающиеся поражения сердца с развитием острого ренокардиального синдрома (ОРКС) при остром постстрептококковом гломерулонефрите, осложненным острым почечным повреждением [3,10,16,17]. Острый ренокардиальный синдром - III тип кардиоренального синдрома по классификации C.Ronco et all 2010 г. Это первичное внезапное нарушение функции почек, приводящее к острому нарушению функции сердца (аритмия, ишемия, острая сердечная недостаточность). При этом происходят перегрузка организма, периферическая вазоконстрикция, электролитные нарушения, которые являются причиной дополнительных нарушений функции почек [7,15,19]. В литературе описаны случаи развития кардиогенного шока при ОРКС [2,4,6,14], а также исследования о нарушениях функции сердечно-сосудистой системы и почек при ОПП, в зависимости от локализации стрептококковой инфекции [5,12,15].

Учитывая вышеизложенное, целью исследования явилось установление особенности развития ОРКС при ОПСГН с остронефритическим синдромом и развитием ОПП и без него у молодых. Задачами исследования сопоставдение клинических показателей с лабораторными данными; выявление особенностей поражения сердечно-сосудистой системы при ОРКС методами функциональных исследований (ЭКГ, эхокардиография) и сопоставление полученных данных с клинико-лабораторными показателями ОПСГН; определение роли этиологического фактора с учетом его локализации на особенности течения ОПСГН и связь с развитием ОРКС.

Материал и методы. В Центральном Клиническом Военном Госпитале и МЦ «Сурб Григор Лусаворич» обследованы 220 больных мужского пола с ОПСГН в возрасте от 18 до 20 лет, за период 2014-2018гг. Все больные были госпитализированы на 2-3 день болезни. С учетом функционального состояния почек больные были разделены на 2 группы. В первую группу вошли 140 больных с ОПСГН без нарушения функций почек, во вторую - 80 больных с острым почечным повреждением (ОПП).