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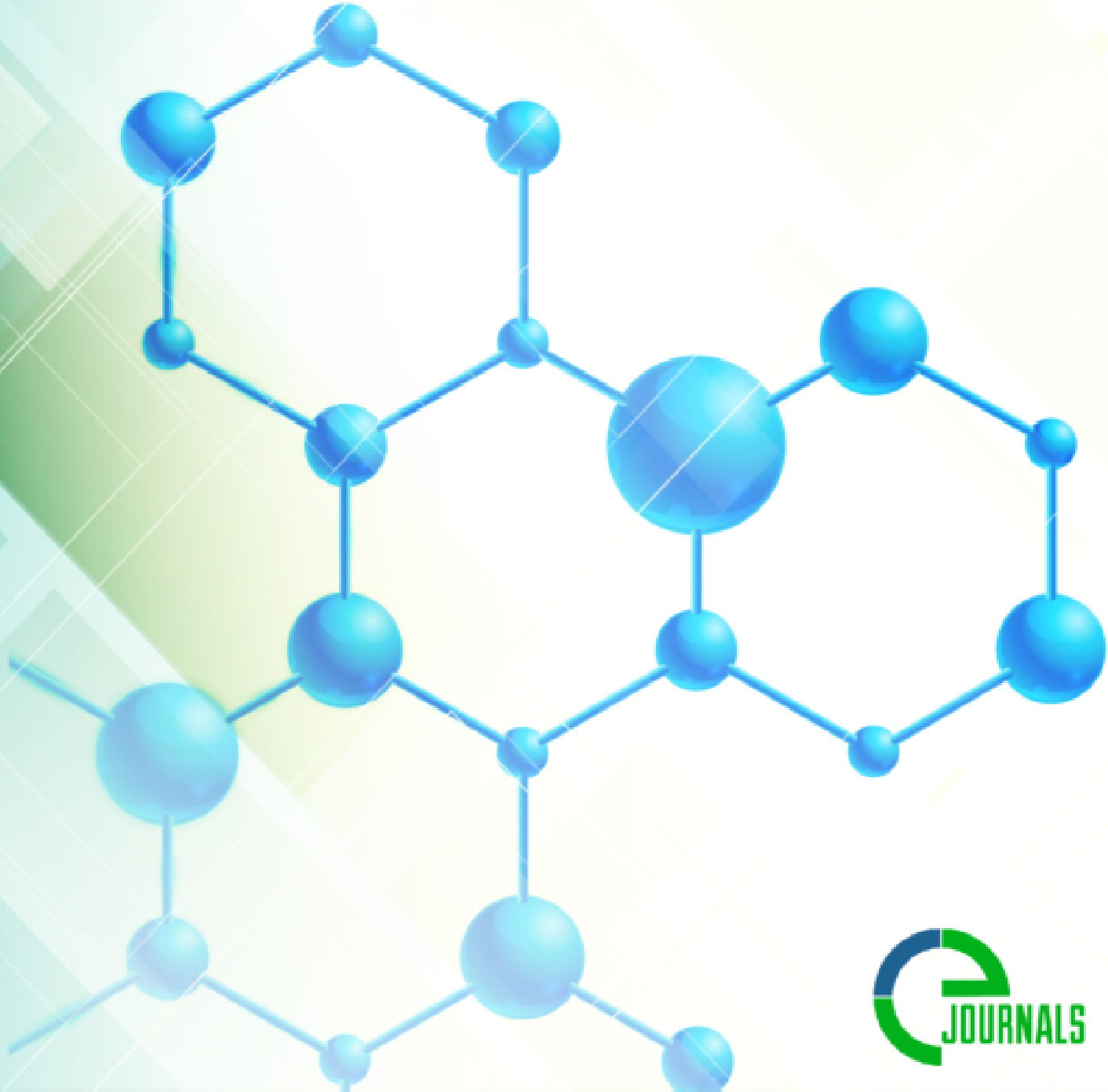

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SOME COMPLICATIONS OF THE NEW CORONAVIRUS INFECTION

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Abstract: A comparative analysis of the development of some complications in 822 patients with a new coronavirus infection was carried out, depending on the severity of the disease.

The results of our analysis in the patients we examined showed the development of complications characteristic of coronavirus infection (2-sided or polysegmental pneumonia, respiratory failure, diabetes mellitus), which were more pronounced in female patients over 60 years of age. All complications developed mainly in patients with 2 or more combinations of concomitant diseases (CHD, hypertension, anemia, etc.)

Keywords: infection, asthenic syndrome, patient, Covid-19

Introduction

The WHO coined the term coronavirus disease 2019 (COVID-19) on March 11, 2020, declaring a pandemic of severe acute respiratory syndrome (SARS) caused by coronavirus type 2 (SARS-CoV-2).

Coronavirus infection causes a variety of issues that impact all of the body's organs and systems. Complications emerge based on both the severity of the disease and the premorbid background.

Common consequences of coronavirus infection are from the respiratory system - prolonged cough, shortness of breath, fibrosis of lung tissue; decreased immunity; from the cardiovascular system - myocarditis, arrhythmias, heart failure; anosmia, ageusia; hearing loss; visual impairment; asthenic syndrome; skin manifestations (vasculitis); pseudomembranous colitis. An analysis of the scientific literature showed that within a month after the first symptoms of Covid-19 appear, almost every seventh hospitalized patient develops diabetes (14.4%).

According to some scientists, pneumonia in the context of SARS-CoV-2 coronavirus infection is primarily caused by a microbial or microbial-viral pathogen and typically has a limited duration. However, a different specialist believes that the primary cause of hypoxic condition in COVID-19 is damage to blood vessel and blood cell walls [3]. By altering the endothelium of blood vessels in the pulmonary circulation, COVID-19 causes the development of angiogenic pulmonary edema with thrombohemorrhagic syndrome in the microvasculature and thrombus formation in arteries and veins. The disease goes through three stages: the stage of invasion (impact on the nasopharynx and gastrointestinal tract), the stage of generalization of viremia and the stage of multiple organ failure [2].

Findings from existing stARFes indicate that microbial communities in the gut and lungs are altered in patients with COVID-19, and these changes may have a critical impact on immunity and severity of COVID-19 disease [5].

Depending on the disease's severity, we compared how different coronavirus infection consequences manifested themselves.

Method

A total of 822 patients aged 20 to 93 years with the diagnosis of COVID-19 coronavirus infection (ICD 10 code U07.1- U07.2) were examined; the mean age of the patients was 51.70ë1.0 years. Of them, there were 346 (42.09%) males and 476 (57.91%) females. Patients were examined according to the temporary methodological recommendations "Prevention, diagnosis and treatment of a novel coronavirus infection (COVID19)".

Results

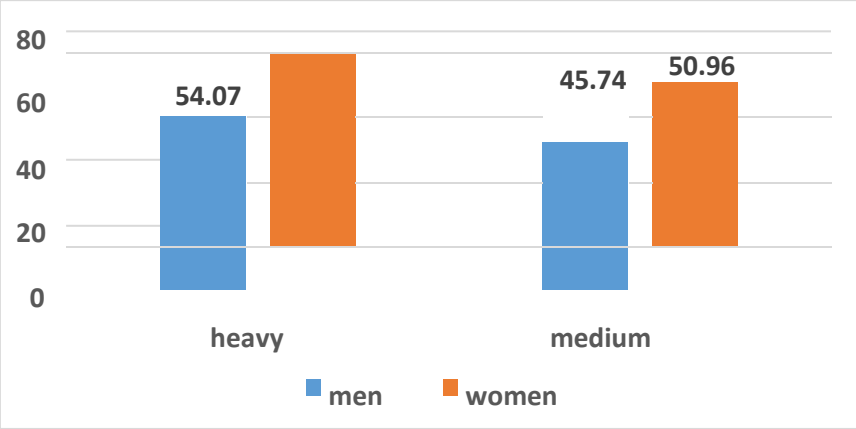
According to the degree of severity of Covid 19 patients examined by us, according to WHO recommendations, were divided into 2 groups: patients with severe course 35.4% (n=291) and a group of patients with moderately severe course 64.6% (n=531).

When the age composition was analyzed, most of the patients examined were between 40 and 70 years of age (55.49%).

The results of statistical analysis of the distribution of patients by sex depending on the severity of the course showed that in both moderate and severe course there is a prevalence of women (1.08 and 1.6 times, respectively) (Fig.2).

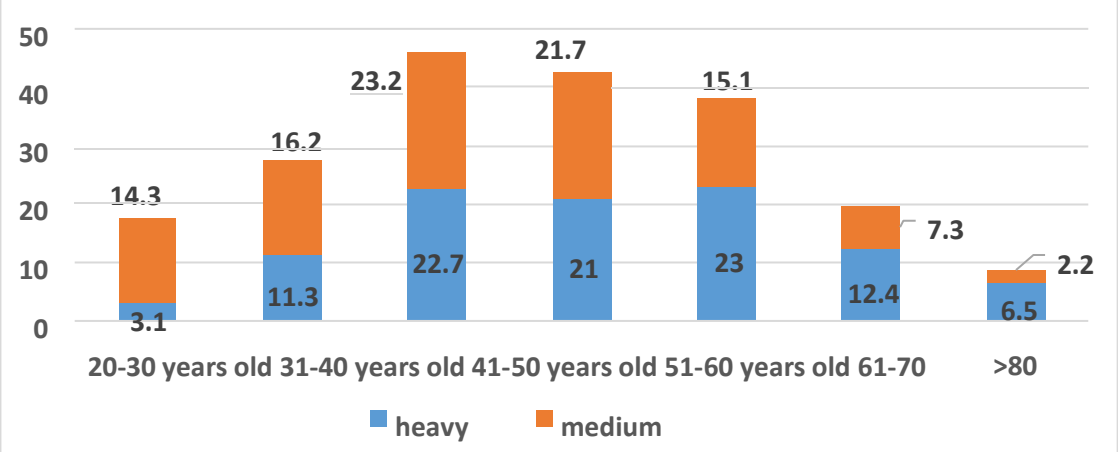
The mean age of patients with COVID 19 moderately severe course of the disease was - 49.07ë0.57%, patients with severe course - 56.13ë0.89% (Figure 1)

Fig 1. Average age of patient depending on the severity of the course of the disease



In both severe and moderate course of the disease, the mean age of female (50.96±0.86 and 58.14±1.15, respectively) was significantly higher than male (45.74±0.86 and 54.07±1.31 years, respectively) patients with new coronavirus infection.

Fig. 2. Distribution of patients by age depending on the severity of the disease course



Complications were detected in the clinic of the examined patients, mainly with a severe course of the disease. Thus, from the total number of patients with severe course of the disease (n=291) RF of different severity was registered in 216 (74.23%) patients: ARF-1 - in 52 (24.07%) people, ARF-2 in 113 (52.31%) and ARF-3 in 54 (23.61%). Of the 531 patients with new Covid19 coronavirus infection with moderate ARF in only 140 (26.36%) patients, of which ARF 1 was observed in 95 (67.85%) patients, ARF2 in 36 (25.71%) and ARF3 in 9 (6.43%) patients (Table 1).

Table 1. Distribution of respiratory failure according to sex and severity of the course of the disease

Showing-	Moderately severe form (140)		Severe form (216)	
calf	Wife.	Husband.	Wife.	Husband.
ARF 1	59 (42,14%)	36 (25,71%)	25 (11,57%)	27 (12,6%)
ARF 2	18 (12,86%)	18 (12,86%)	66 (30,56%)	47 (21,76%)
ARF 3	6 (4,29%)	3 (2,14%)	26 (12,04%)	25 (11,57%)

Note:*- P>0.05 reliable difference of indices in relation to indices of patients with severe form of the disease;

The analysis of ARF distribution in the examined patients depending on gender showed that this complication developed mainly in female patients with severe course of the disease (54.17%), and ARF of the 3rd degree was detected mainly in patients with severe course of the disease (51; 17.53%), while in patients with moderately severe course it was detected only in 9; 1.69% of patients.

Acute respiratory failure in the patients we examined was mainly due to another frequent complication, which was also observed more often in patients with severe course of the disease. Thus, in the majority (739; 89.90%) of patients the clinical picture was characterized by the presence of bilateral viral pneumonia, only in 30 (3.65%) patients was polysegmental pneumonia.

In 53 (6,45%) In 53 (6.45%) people the disease proceeded without lung lesions (Table 2).

Table 2. Frequency of detected complications of examined patients with coronavirus infection depending on the severity of course

ELSEVIER SSRN Universal Impact Factor

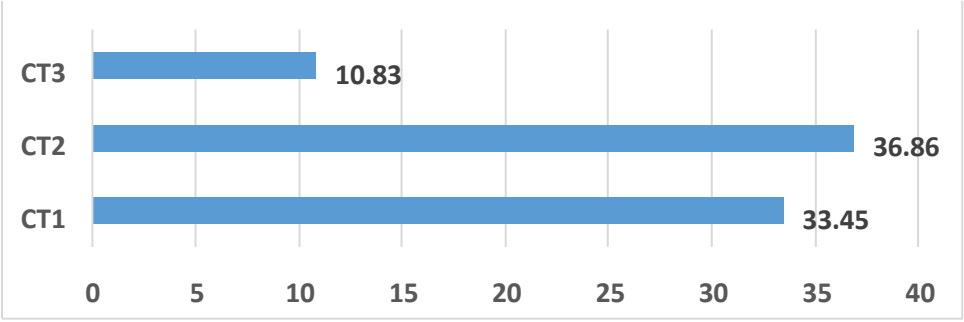
Complications		General (822)		medium heavy (531)		Heavy (291)	
		abs.	%	abs.	%	abs.	%
Diabetes mellitus		111	13,50±0,13	53	9,98±0,14*	58	19,43±0,26
2 st.inter. pneumonia		739	89,90±0,33	465	87,57±0,40*	274	94,16±0,57
polisegmental inter.pneumonia		30	3,65±0,07	13	2,45±0,07*	17	5,84±0,14
RF	1	147	17,88±0,15	95	17,89±0,18*	52	17,87±0,25
	2	149	18,13±0,15	36	6,78±0,11*	113	38,83±0,36
	3	60	7,30±0,09	9	1,69±0,06*	51	17,53±0,25
ACF		11	1,34±0,04	-	-	11	3,78±0,11
sepsis		4	0,49±0,02	-	-	4	1,37±0,07
encephalopathy		24	2,92±0,06	10	1,88±0,06	14	4,81±0,13
polyorganic insufficiency		11	1,34±0,04	4	0,75±0,04	9	3,09±0,104
Vascular thrombosis		4	0,49±0,02	-	-	4	1,37±0,07

Note:* -P>0.05 reliable difference of indices in relation to indices of patients with severe form of the disease;

The severity of pneumonias was determined by CT scanning in accordance with the accepted gradation by the volume of lung tissue lesions and was distributed a s follows: CT-1 - in 275 (33.45%), CT-2 - in 303 (36.86%), CT-3 in 89 (10.83%) patients, and 161 (19.59%) patients had no CT data (Figure 3.9).

Out of 77 patients with severe course of disease with CT3, most of them were over 65 years of age (39; 50.65%) and out of 12 patients with moderate course with CT3, 7 (58.3%) were over 65 years of age.

Figure 3. Lung condition of patients with coronavirus infection according to CT data



In 111 (13.50±0.13%) of our patients with new coronavirus infection Covid 19, diabetes mellitus was recorded for the first time, with more frequent in patients with severe course (58; 13.4%) than in patients with moderate course (53; 9.98%) of patients (Table 2).

The obtained results of observation of the patients with coronavirus infection examined by us have shown that in the course of the disease in patients also revealed in 11 (3,78%) cases of acute cardiovascular failure (all in patients with severe form), encephalopathy in 24 (2,92% of the total group of patients), in 14 (4,81%) cases of which were revealed in patients with severe form).

We have carried out a correlation analysis of some complications detected in our examined patients with coronavirus infection depending on gender differences. Thus, we analyzed the correlation of polysegmental (PSP), 2-sided pneumonia, acute respiratory failure (ARF), encephalopathy, and diabetes mellitus depending on gender.

Table 3 Correlation analysis of the incidence of PSP, 2-sided pneumonia, ARF depending on gender.

indicators	Paul		p
	Women	Men	
no pneumonia	1 (0,7)	0 (0,0)	
2-sided pneumonia	145 (96,0)	133 (95,0)	0,403
PSP	4 (2,6)	7 (5,0)	

When analyzing the obtained results of the relationship between the frequency of PSP, 2-sided pneumonia depending on sex, we failed to establish statistically significant differences (p = 0.403) (method used: Pearson's Chisquare). That is, we observed the development of 2-sided and polysegmental pneumonia with the same frequency regardless of sex differences (Table 3).

We also analyzed the rates of acute respiratory failure of different degrees according to gender.

Table 4. Analysis of frequency of ARF1, ARF2 and ARF3 detection by gender

Categories	Pul		p
	Women	Men	
no ARF	30 (19,9)	42 (30,0)	
ARF1	15 (9,9)	34 (24,3)	< 0,001*
ARF2	79 (52,3)	49 (35,0)	
ARF3	27 (17,9)	15 (10,7)	

* - differences are statistically significant ($p < 0.05$)

As a result of comparing the index of ARF of different degrees depending on gender, significant differences ($p < 0.001$) were revealed (method used: Pearson's Chi-square). Thus, ARF1 degree was significantly more frequent in male patients with new coronavirus infection, while ARF 2 and 3 degrees correlated significantly more with female patients (Table 4).

Table 5 Analysis of the incidence rate of encephalopathy according to gender

Categories	gender		p
	Women	Men	
no encephalopathy	139 (92,1)	140 (100,0)	
there's encephalopathy.	12 (7,9)	0 (0,0)	< 0,001*

* - differences are statistically significant ($p < 0.05$)

According to the obtained data, statistically significant differences ($p < 0.001$) were found when evaluating the frequency of encephalopathy detection according to gender (method used: Fisher's Exact Test) (Table 5).

Analysis of odds of developing encephalopathy in the male group were lower by 25.2 times compared to the female group, the odds differences were statistically significant (OR = 0.040; 95% CI: 0.002 - 0.677).

Correlation analysis of the development of diabetes mellitus in the course of treatment of coronavirus infection in our examined patients according to gender showed no significant differences ($p = 0.116$) (method used: Pearson's Chisquare).

The odds of developing DM were 1.592 times lower in the male group compared with the female group, the odds differences were not statistically significant (OR = 0.628; 95% CI: 0.351 to 1.125).

We also performed a correlation analysis of the association between the development of diabetes mellitus in patients with coronavirus infection and pneumonia (multisegmental and 2-sided pneumonia).

Table 5 Analysis of the frequency of diabetes mellitus detection in patients coronavirus infection with pneumonia.

Categories	PSP (polysegmental pneumonia), 2-sided pneumonia, ARF3				p
	no pneumonias	2-way bronchopneumonia	ARF3	PSP	
no DM	0 (0,0)	223 (80,2)	0 (0,0)	9 (81,8)	0,047*
There's an DM	1 (100,0)	55 (19,8)	1 (100,0)	2 (18,2)	

* - differences are statistically significant ($p < 0.05$)

Based on the obtained data, statistically significant differences ($p = 0.047$) were found when comparing diabetes mellitus depending on pneumonia (method used: Pearson's Chi-square). In patients with 2-sided pneumonia, PSP and patients with ARF 3, the presence of diabetes mellitus was significantly more frequent (Table 5).

Conclusions. Thus, the results of the analysis in the patients we examined showed the development of complications characteristic of coronavirus infection (2-sided or multisegmental pneumonia, acute cardiovascular and respiratory failure, diabetes mellitus), which were more pronounced in female patients over 60 years of age. All complications developed mainly in patients with 2 or more combinations of concomitant diseases (CHD, hypertension, anemia, etc.).

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