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Преимущества и недостатки режима самоизоляции в период первой волны коронавирусной инфекции для пациентов с полиморбидной патологией

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АННОТАЦИЯ

Обоснование. В связи с быстрым распространением новой коронавирусной инфекции (НКИ), развитием тяжелых форм, особенно среди пациентов с полиморбидной патологией (ПМП), нехваткой ресурсов для обеспечения оптимального лечения больных, во многих странах, в т.ч. в Российской Федерации, был введен режим самоизоляции (англ.: «lockdown»). Полиморбидность повышает риск смерти, тем более в период пандемии. Наиболее уязвимой частью населения являются пациенты с множественными хроническими заболеваниями. Данных о летальности среди этой группы в период самоизоляции недостаточно.

Цель. Изучить летальность от всех причин и ее структуру, не связанную непосредственно с НКИ, у пациентов с ПМП в период самоизоляции.

Материал и методы. Изучены амбулаторные карты 2423 пациентов с ПМП (841 муж и 1582 жен, в возрасте от 18 до 99 лет). У пациентов определяли летальность и ее причины за последние три года; включая период самоизоляции.

Результаты. Летальность от всех причин среди больных с ПМП составила 10,2% без статистически значимых различий по гендерному признаку. Основные причины смерти больных с ПМП: болезни системы кровообращения — 50,8%, онкологические заболевания — 21,0%, заболевания нервной системы — 7,3%. В период самоизоляции зарегистрирован рост летальности от всех причин на 34,3% ($p < 0,05$), при увеличении числа умерших среди больных с болезнями системы кровообращения (особенно, ишемической болезнью сердца) на 19,5% ($p > 0,05$).

Заключение. Зарегистрировано увеличение числа умерших больных с ПМП в период самоизоляции, что может быть обусловлено ограничением физической активности, возможности обследования и консультирования профильными специалистами. Учитывая уязвимость этой группы пациентов, возникает настоятельная необходимость разработки профилактических мероприятий при повторении ситуации.

Ключевые слова: *полиморбидность; самоизоляция; летальность; новая коронавирусная инфекция; COVID-19*

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Advantages and disadvantages of lockdown (self-isolation regime) introduced during the first wave of coronaviral infection for patients with polymorbid pathology

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ABSTRACT

BACKGROUND: Due to the rapid spread of the new coronavirus infection, the development of severe forms, especially among patients with polymorbid pathology, lack of resources to ensure optimal treatment of patients, in many countries, including the Russian Federation, self-isolation regime was introduced, or the so-called lockdown. Polymorbidity increases the risk of death, especially during a pandemic. Patients with multiple chronic diseases are the most vulnerable part of the population. Mortality among this group during the period of self-isolation has not been studied.

AIM: To study the structure of mortality not caused by coronavirus infection, in patients with polymorbid pathology during the period of self-isolation (lockdown).

MATERIALS AND METHODS: Outpatient records of 2,423 patients with polymorbid pathology (841 males and 1,582 females, aged from 18 to 99 years) were examined. The mortality and its causes during three years including a period of lockdown were investigated.

RESULTS: The overall mortality rate among patients with polymorbid pathology was 10.2% without differences in gender. The structure of the causes of death in patients with polymorbidity: cardiovascular diseases accounted for 50.8%, oncological diseases — 21%, nervous system diseases — 7.3%. During the lockdown, an increase in overall mortality by 34.3% was recorded ($p < 0.05$), with an increase in the number of deaths of patients with cardiovascular diseases by 19.5% ($p > 0.05$) (mostly patients with ischemic heart disease).

CONCLUSION: An increase in the number of deceased patients with polymorbidity during the lockdown may be due to the limitation of physical activity, of the possibility of examination and consultation by profile specialists. Taking into account the vulnerability of this group of patients, there is an urgent need to develop preventive measures when the situation recurs.

Keywords: *polymorbidity; lockdown; mortality; new coronavirus infection; COVID-19*

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ECO•VECTOR

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BACKGROUND

The worldwide spread of a new coronavirus infection (NCVI, coronavirus disease 2019 [COVID-19]) has introduced certain adjustments in almost all spheres of human activity. The healthcare systems of all countries have faced problems, such as the lack of information about the mechanisms of transmission, course, diagnosis, treatment, and prophylaxis of a new infection. Owing to the rapid spread of the disease, the development of severe disease forms, especially among patients with polymorbid pathology (PMP), and the lack of resources to ensure optimal treatment of patients, in many countries including the Russian Federation (RF), self-isolation, or the so-called lockdown, was introduced. If the populations are unvaccinated, this measure is justified and necessary; however, it has some negative consequences that affected the health of patients with PMP.

Self-isolation was introduced in the RF to withstand the first wave of NCVI with minimal losses; in comparison with other countries, within a short period of time, new hospitals were built for patients with NCVI, vaccines were developed, and methods of treatment and prophylaxis were elaborated. Moreover, there are disadvantages, which are associated with increase in mortality not directly related with NCVI, and this was observed in the RF in general and in the Ryazan region (RR) particularly [1-3].

Polymorbidity increases the risk of death [4-7], especially during a pandemic; the most vulnerable members of the population are patients with multiple chronic diseases. However, there is insufficient data on mortality among this group during self-isolation.

Aim — to investigate mortality from all causes not related to NCVI during self-isolation (lockdown), with a focus in patients with PMP.

MATERIALS AND METHODS

To achieve the study's aim, medical records of 2,423 patients (34.7% men, 65.3% women aged 18–99 years) with PMP (two and more diseases in one patient) were selected by random sampling method and were included in this prospective cohort study.

All-cause mortality and its structure were studied for 3 years. Death certificates of patients who died within the 3-year observation period (2018–2020) were analyzed. To determine the cause of death, the existence of the following conditions were taken into account: circulatory system (CS) disorders; neoplasms; diseases of the respiratory, digestive, endocrine, and nervous systems; external causes; and other causes (including kidney diseases, infections not related to NCVI, and cases with unknown causes of death).

We developed a polymorbidity index that was based on factors that influence mortality, such as age, cardiovascular diseases, oncological diseases, diabetes mellitus, and other diseases (Table 1).

Table 1. Polymorbidity Index for Determining Prognosis

Points	Factors
+5	Diseases of the circulatory system
+3	Neoplasms
+2	Diabetes mellitus
+1	Any somatic disease
+1	+ 1 point is added for each 10 years of life

RESULTS

Within the 3-year observation period, the all-cause mortality rate in patients with PMP was 10.2% (i.e., 248 patients of 2,423 died, including 87 men and 161 women). The average age of death was 76 years. No significant difference in gender was recorded; however, the average age of death in women was 78 years, while that of men was 68 years.

The structure of causes of death among patients with PMP was not significantly different from similar parameters of the general population of RF and RR [1, 2, 8]. The main causes of death were as follows:

First most common cause — CS diseases (50.8%)

Second most common cause — oncological diseases (21%)

Third most common cause — nervous system diseases (7.3%)

A study of all-cause mortality by years showed some increase in 2020:

2018: 77 individuals (3.2%)

2019: 73 individuals (3.1%)

2020: 98 individuals (4.3%, $p < 0.05$ compared with the previous years)

The number of patients with diseases of CS increased by 19.5% in comparison with 2019; however, the difference between parameters of the previous years was not significantly different (Figure 1).

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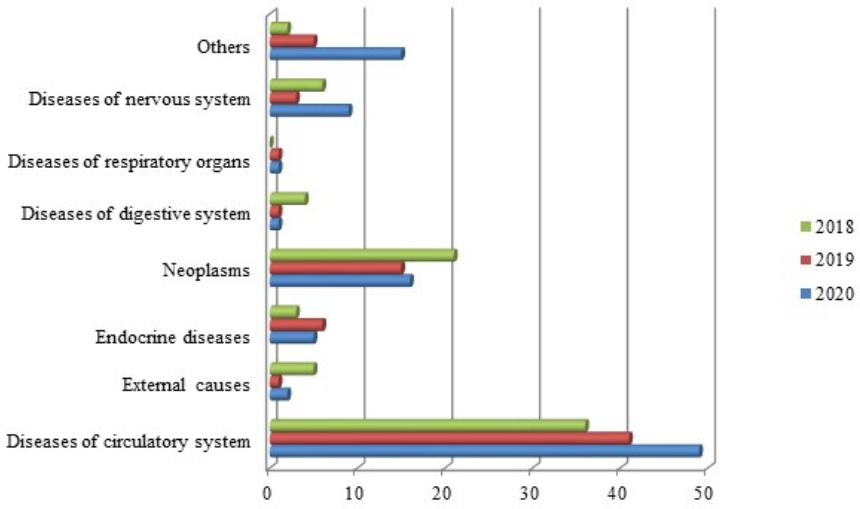

Fig. 1. Comparative dynamics of the causes of death in absolute numbers (number of patients) within 3 years of observation (2018–2020).

Among diseases of the CS, ischemic heart disease, not cerebrovascular disease, has fatal outcomes:

2018:14 patients

2019: 12 patients

2020: 25 patients

Importantly, no patient died from NCVI.

Analysis of polymorbidity index shows that its levels are increased in deceased patients ($p < 0.001$ comparison between living and deceased patients, Table 2). The polymorbidity index was quite lower than in patients who died during self-isolation years than in patients who died in the previous years. The age of patients who died in 2020 was 4 years lower than of those who died in 2019 ($p > 0.05$).

Table 2. Comparative Analysis of Polymorbidity Index Depending on the Fatal Outcomes within 3 years Observation (M ± δ)

	2018	2019	2020
Deceased	14.5 ± 3.7*	14.5 ± 3.4*	13.4 ± 3.6*
Alive	10.4 ± 4.1	10.4 ± 4.0	10.2 ± 4.2

Note: * — $p < 0.001$; comparison between deceased and living patients

DISCUSSION

Thus, information about causes of death of patients with PMP under self-isolation conditions is critical for the elaboration and realization of preventive measures to reduce mortality and improve the quality of life [9, 10].

Analysis of data showed a higher mortality rate in patients with multiple chronic diseases than in the general population [1, 2], which may be due to PMP alone. The structure of causes of death is not much different from similar parameters for the RF and RR.

An increase of about one-third in all-cause mortality rate under self-isolation condition may be associated with factors, such as physical activity limitation, lack of resources because several specialists were sent to combat NCVI, conversion of some hospitals for the treatment of patients with NCVI, temporary closure of different schools that provide information on various pathologies, and lifestyle. The probability for the asymptomatic course of NCVI cannot be ruled out, which could worsen the course of the comorbid pathology and development of a fatal outcome.

A decrease in the polymorbidity index in patients who died during the isolation period may indicate both a decrease in the age of death and "loading" of patient with diseases, that is, they died at a younger age with lesser amount of polymorbid conditions.

The increase in the number of patients with CS disorders during the self-isolation period compared with 2019 is not significantly reliable, which may be due to the small number of study groups. However, the mortality from CS disorders, which increased by 19.5% in patients with PMP during self-isolation, *suggest the*

need for development of a new approach to preventive measures for this group in a similar situation. Notably, deaths among patients with ischemic heart disease increased more than twice. Other authors have also noted increased mortality from CS disorders during the self-isolation period [11, 12] and emphasized the lack of significant changes in hospital mortality, which indicates the importance of timely hospitalization during this period. Interestingly, the mortality rate of patients with COPD during lockdown did not increase, which may be due to the decreased contact with infection, pollutants, etc. [13]. Moreover, we did not find an increase in the mortality caused by bronchopulmonary pathology.

The necessity and rationale of self-isolation during NCVI epidemic are certain because many questions arose concerning the epidemiological aspect of NCVI and patient treatment algorithms, which were taken into account in the temporary recommendations on the topic. As more data were obtained, how and which treatment is needed by patients with NCVI were elucidated [14]. The development of favipiravir and then of vaccines helped reduce the tension and relieve restrictive measures. With this, patients with PMP remain in the risk group, and if threats to health and life are observed, including infection, these patients should be provided with an elaborate protection algorithm.

CONCLUSION

The introduction of self-isolation in the first wave of the coronavirus infection has undoubtedly help the population withstand the struggles brought by the pandemic with minimal losses. During the self-isolation period, among patients with PMP, an increase in all-cause mortality and a tendency to increase the mortality from CS disorders were observed.

This may be due to limitations in physical activity and possibility of examination and consultation by profile specialists and the impossibility to work and attend different schools.

Taking into account the vulnerability of this group of patients, there is an urgent need to develop preventive measures in case of recurrence. Patients with CS disorders require special attention.

ADDITIONAL INFORMATION

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