

MEDICAL AND SOCIAL ANALYSIS OF PATIENTS WHO DIED OF SARS-COV-2 IN THE SPECIALIZED INFECTIOUS DEPARTMENT OF THE CITY OF SUMY DURING THE FIRST WAVE OF THE EPIDEMIC

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ABSTRACT

The aim of the article is to analyze demographic indicators, clinical symptoms, concomitant pathology, and the course of acute respiratory viral infection (ARVI) caused by SARS-CoV-2 in patients with a fatal outcome of the disease.

Materials and methods: To achieve the goal, a statistical method, an analytical method, and a method of retrospective analysis of the medical histories of patients with fatal cases who were hospitalized with a diagnosis of ARVI caused by SARS-CoV-2 were used.

Results: Mortality among patients who were hospitalized with a diagnosis of ARVI caused by SARS-CoV-2 was $8.18 \pm 2.17\%$. Among them, 62% were male and 38% were female. Cardiovascular pathology took first place in the structure of concomitant pathology of all age groups and accounted for 76%. Oncological diseases accounted for 62%, gastrointestinal diseases – 54%, endocrine diseases – 38%, and respiratory system diseases 23% of the total number of patients with fatal cases.

Conclusions: Mortality from coronavirus infection in the period March - July 2020 among the male population was 62%, of which 13% - from the age group 18-45 years, 38% - from the age group 46-64 years, and 50% - patients 65 years old and older. Among the female population, the mortality rate was 38%, of which 20% were women in the age group 46-64% and 80% were 65 years and older. The presence of no-hospital polysegmental pneumonia as a complication of ARVI caused by SARS-CoV-2 was 62% among all age groups of the studied patients with fatal cases.

KEY WORDS: mortality, pneumonia, diseases of the cardiovascular system, coronavirus infection

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INTRODUCTION

The epidemic of the disease COVID-19, which began in China, very quickly covered the whole world. Clinical symptoms, features, and severity of the course of the disease were detailed by scientists from China, Western Europe, and America. The fatality rate among patients in China was 3.67%, and among patients over 80 years old — 18.4%. According to the results of the analysis in other countries, the fatality rate ranges from 2 to 12%, and is difficult to estimate it given the lack of testing among people with mild symptoms of the disease [1].

Data are confirmed in all countries that men are more often infected with SARS-CoV-2 and have a severe course [1]. In the United States of America, the mortality rate among men was 1.4 times higher than among women, and in China, it was 1.6 times higher. This is associated with a different hormonal background and the presence of more estrogen in the female body, which stimulates immunity [2].

Scientists have identified a number of concomitant diseases that increase the risk of a severe course of the disease and mortality, respectively. These include diabetes, hypertension, diseases of the cardiovascular system and oncology. Also, the risk factors include advanced age, overweight and the presence of bad habits, especially smoking. [2 - 4]. It has been proven that diabetes is not only a risk factor, but also arises as a complication of the transferred COVID-19.

In the world literature, a different course of the disease is described, from mild, which can pass without pronounced symptoms, to critical, which leads to the death of the patient. The general symptoms of the disease are the same: an increase in body temperature, dry cough and shortness of breath, weakness, but they are expressed in different degrees depending on the age, gender and individual characteristics of the body. In China, 87.9% of patients with ARVI caused by SARS-CoV-2 had fever, 67.7% had cough, and 38.1% had weakness. Scientists have described specific symptoms

of the disease, namely, the loss of the sense of smell and taste. As the results of international studies show, pneumonia is the most dangerous complication of coronavirus infection, but despite the fact that the virus mainly affects the respiratory system, frequent cases of multiple organ failure, septic shock, thrombosis, etc. have been described. [5 - 7].

However, many issues remain unanalyzed in Ukraine today, namely the mortality rate in different regions of the country and among different age groups of the population; dependence of the presence of risk factors, terms of seeking medical help and hospitalization with the severity of the course of the disease and mortality. Therefore, it will be relevant to conduct a retrospective analysis of the disease histories of patients with fatal cases in the specialized infectious department of Sumy.

THE AIM

The purpose of our study is to analyze demographic indicators, clinical symptoms, concomitant pathology and the course of acute respiratory viral infection caused by SARS-CoV-2 in patients with a fatal outcome of the disease.

MATERIALS AND METHODS

The study was conducted by the Department of Public Health of the Medical Institute of Sumy State University during March - July 2020. Research methods – statistical, analytical, retrospective analysis of disease histories of patients with fatal cases who were hospitalized with a diagnosis of SARS caused by SARS-CoV-2. The analysis of patient histories was carried out according to a specially developed form that took into account their distribution by age and gender (Table I).

A total of 158 disease histories of patients admitted to the hospital with a diagnosis of SARS caused by SARS-CoV-2 were analyzed, men – 56.33%, women – 43.68%. The disease ended fatally in 13 patients.

RESULTS

Mortality among patients who were hospitalized with a diagnosis of ARVI caused by SARS-CoV-2 was $8.18 \pm 2.17\%$. Among them, 62% were male and 38% were female. Research patients are divided into age groups, namely patients 18-44 years old, 45-64 years old, 65 years old and older. Therefore, the mortality among hospitalized patients of each age group was 7.69%, 30.77%, 61.54%, respectively. In the age group of 65 years and older, mortality was the highest and the same in quantitative composition among men and women (Table II).

46% of patients with fatal cases were referred by general practitioners of family medicine, and 54% by doctors of emergency medical care. A greater number of patients, 69%, were hospitalized on the 1st–3rd day from the moment of seeking medical help, and for 33% of patients, it was 1–3 days from the onset of the disease, 44% - 4–7 days from the onset of the disease, and for 23% - 14 days or more. 31% of patients were hospitalized for 4–6 days after seeking medical help. They were referred by family practice and emergency physicians in equal numbers. All patients with a fatal case had a positive polymerase chain reaction (PCR) test at the time of admission.

In the age group of patients 18–44 years, concomitant pathology of the cardiovascular and endocrine systems, diseases of the gastrointestinal tract, and oncology accounted for 25%. Oncological diseases accounted for the largest share of 30% of concomitant pathologies in the age group 45–64 years, the same share of 20% was observed for cardiovascular pathology, diseases of the respiratory system and gastrointestinal tract, and 11% were concomitant diseases of the excretory system. (Fig. 1, 2).

Among patients in the age group of 65 years and older, cardiovascular concomitant pathology was 33%, and an equal number of 19% were diseases of the endocrine system, gastrointestinal tract, and oncological diseases, and 5% were diseases of the respiratory system and the excretory system (Fig. 3).

But it should be noted that cardiovascular pathology took the first place in the structure of concomitant pathology of all age groups and accounted for 76%. Oncological diseases accounted for 62%, gastrointestinal tract diseases - 54%, endocrine diseases - 38%, and respiratory system diseases - 23% of the number of patients with fatal cases.

It should be noted that 40% of patients had concomitant pathology of the cardiovascular system and gastrointestinal tract, 38% - had cardiovascular and endocrine systems, and 23% - had cardiovascular, endocrine systems, gastrointestinal tract, and oncological diseases. Only one patient from the age group of 65 years and older did not have any of the concomitant pathologies, all others had one, two, or more diseases. Therefore, we can claim that ARVI caused by SARS-CoV-2 aggravated their condition and led to death.

46% of patients died on the 1st–3rd day of hospitalization, 38% of patients died on the 7–9th day, and 16% of patients died after the 13th day of hospitalization. The course of the disease in patients with fatal cases was also different: 39% - severe, 30% - undetermined, 23% - moderate, and 8% - critical.

62% of patients with fatal cases had nosocomial

Table I. Distribution of experimental patients by age and gender, %

Age group / Gender	18 – 44 years old	45 – 64 years old	65 years old and older
Males	8,86	28,48	18,99
Females	10,13	23,42	10,13
Total	18,99	51,90	29,12

Table II. Distribution of experimental patients with fatal cases by age and gender, %

Age group / Gender	18 – 44 years old	45 – 64 years old	65 years old and older
Males	7,69	23,08	30,77
Females	0	7,69	30,77
Total	7,69	30,77	61,54

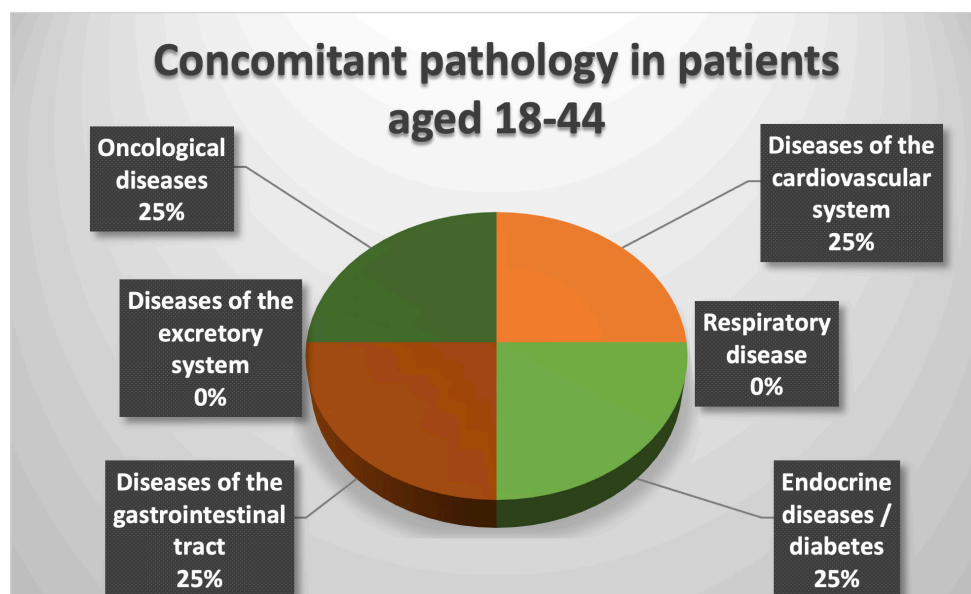


Fig. 1. Distribution of concomitant pathology among patients aged 18-44 years

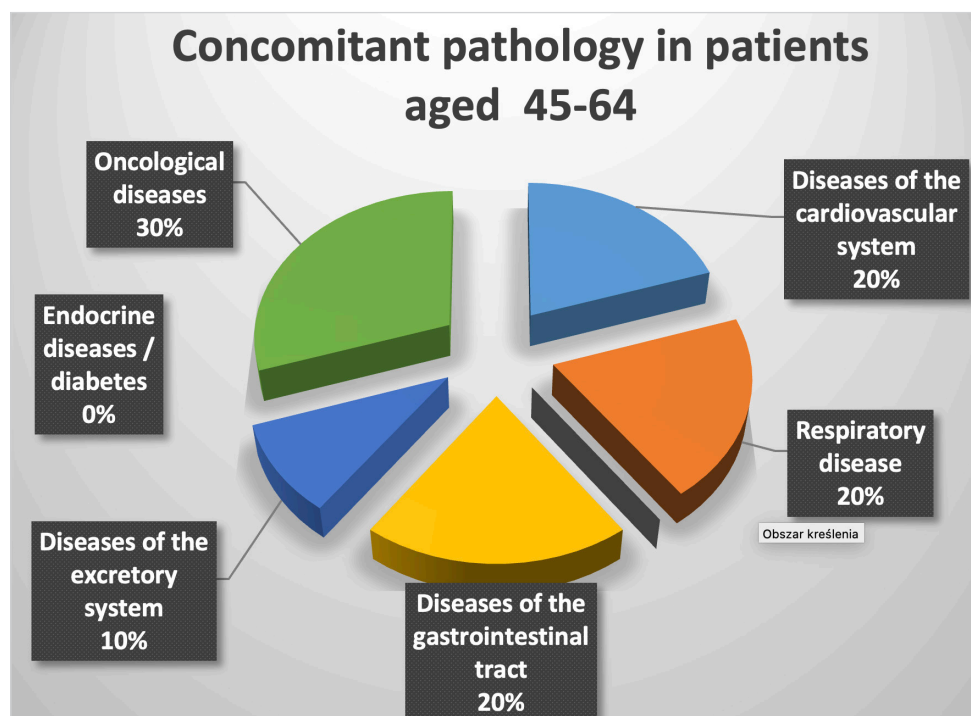


Fig. 2. Distribution of concomitant pathology among patients aged 45-64

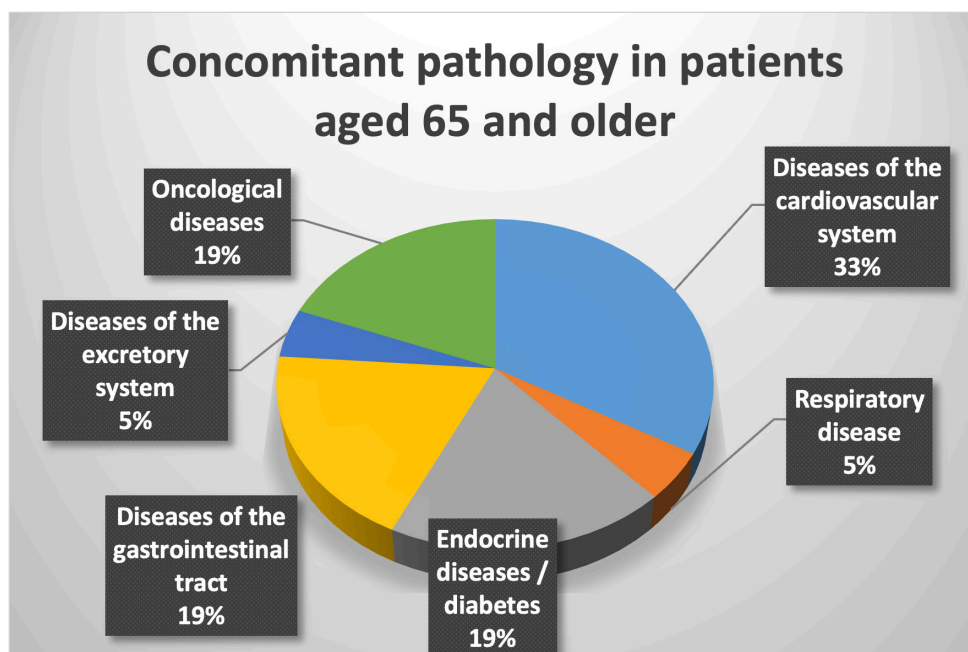


Fig. 3. Distribution of concomitant pathology among patients aged 65 and older

pneumonia and complications of the main disease - heart damage. They also had other complications: 37.5% - septic shock, 25% - kidney damage, and 12.5% - liver damage.

In patients with a fatal disease, an equal number of 23% observed an increase in body temperature from 37.0 to 37.5 °C and from 37.6 to 38.5 °C, in 54% - above 38.6 °C. 85% of patients who died had weakness and shortness of breath. At the same time, these patients had no complaints of headache, runny nose, or sore throat.

62% of patients had a dry or wet cough and 75% of them had community-acquired pneumonia confirmed by X-ray or computed tomography and a positive PCR test at the time of admission. Previously, all of them had contact with persons sick with COVID-19, that is, they had an unfavorable epidemiological environment.

DISCUSSION

According to WHO data, the mortality rate from coronavirus infection in the world is 2.22%, and in Ukraine - 1.96%. During the conducted research (March - July 2020), the mortality rate in the world was 4.64% [11]. The research results showed that the mortality rate in the Sumy region in the above-mentioned period was 8.18%. According to the data of the Ministry of Health of Ukraine, the mortality rate in the regions of the country has decreased significantly and is 1.38% in the Sumy region. And although the percentage of mortality is still significant, the downward trend in different age groups of the population indicates that the medical system of the region is well-functioning.

The mortality rate among men in the Sumy region was 1.6 times higher than among women and amounted to 62%. Such results regarding the gender sensitivity of the disease are confirmed by WHO data and scientists from different countries of the world [1, 7 - 10, 12]. The age group of patients 65 years and older is the most vulnerable in the Sumy region, and 54% of comorbidities in these patients were diseases of the cardiovascular system. Scientists from China, America, and other countries of the world [2 - 4, 6, 13] identify various risk factors for complications and a severe course of the disease. Among them, the leading place belongs to hypertension, diabetes, heart ischemia, oncological diseases, and others. Among patients in the study group who died, endocrine and oncological diseases accounted for 19–25% and 19–30%, respectively.

Scientists have proven that the main and most common complication of coronavirus infection in the world is community-acquired polysegmental pneumonia [7, 14, 15]. 62% of patients who died had pneumonia as a complication of the disease and mainly severe and critical course.

The literature describes the symptoms of coronavirus infection, such as anosmia, ageusia, increased body temperature, weakness, chills, headache, cough, chest pain, and others. Among patients with a fatal outcome of the disease of all age groups, an increase in temperature up to 37.5° and 38.5° was observed in 23% of patients and above 38.6° in 54%. Weakness and shortness of breath were also found in 85%, dry or wet cough in 62%, and chest and muscle pain, anosmia, and ageusia in only 15% of patients with fatal cases.

CONCLUSIONS

1. The mortality rate from coronavirus infection in the period March - July 2020 was 8.18%, and now it has decreased to 1.38%, which indicates the stability and efficiency of the medical system of the Sumy region.
2. High mortality among men was determined at 62%, of which 13% - were from the age group of 18-45 years, 38% - were from the age group of 46-64 years, and 50% - patients 65 years and older. In women, the mortality rate was 38%, of which 20% were women in the age group 46-64% and 80% - 65 years and older.
3. The most common symptoms among patients with a fatal outcome were: weakness and shortness of breath in 85%, cough in 62%, fever above 38.6° in 54%, chest and muscle pain, anosmia, and ageusia only in 15%.
4. The age group of patients 65 years and older with existing concomitant pathology of the cardiovascular system had the highest mortality rate of 54%.
5. The presence of community-acquired polysegmental pneumonia as a complication of ARVI caused by SARS-CoV-2 was 62% among all age groups of the studied patients with fatal cases.

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Conflict of interest:

The Authors declare no conflict of interest

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