DIFFERENCES IN TREATMENT AND POST-COVID SYMPTOMS IN ELDERLY AND YOUNG PATIENTS: A CROSS-SECTIONAL STUDY

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A – study design, B – data collection, C – statistical analysis, D – interpretation of data, E – manuscript preparation, F – literature review, G – sourcing of funding

ABSTRACT

Background: Long COVID is of particular concern among older people, who are at greater risk than younger people for persisting symptoms associated with COVID-19. In addition, COVID-19 might trigger or exacerbate chronic conditions that occur commonly in older people, such as cardiovascular diseases, respiratory diseases, and others.

Aim of the study: This study aimed to investigate the differences in treatment types and post-COVID symptoms in elderly versus young patients.

Material and methods: Alternative, non-parametric, and correlation analyses were used. Logical units of observation: Two hundred patients suffered from COVID-19 in the period from 01.09.2021 until 01.09.2022.

Results: The majority of those examined were women – 58.5%. Age turned out to be a key factor in the disease. As age increases, cardiac complaints also increase p=0.001 (χ^2=79.51). The correlation relationship was straight and significant, p=0.001 (r=0.619). In the studied group, "shortness of breath" was more often experienced by the elderly group compared to young patients p=0.001 (χ^2=17.90), p=0.001(r=0.278). Regarding the symptoms of "hair loss" and fatigue, gender was found to have a key role in women (p=0.001, χ^2=5.04; p=0.001, χ^2=9.60, respectively). The analysis of our study shows that the majority were treated on an outpatient basis, and the rest – 29.5% – received their treatment in a hospital.

Conclusion: In conclusion, this study underscores the multifaceted nature of post-COVID recovery, influenced by demographic factors, vaccination status, and the presence of comorbidities.

KEYWORDS: post-Covid symptoms, elderly patients, treatments, young patients, differences

BACKGROUND

The coronavirus is one of the most common pathogens among humans and animals that causes various respiratory diseases [1]. In December 2019, a new type of coronavirus disease 2019 (COVID-19) caused an acute respiratory disease that began in the Hubei Province of Wuhan City, China, and in a very short time spread worldwide, causing many deaths [2, 3]. Bulgaria was also one of the countries affected, with the first cases of the virus being detected on 03/08/2020 [4].

Until now, there has been no established and generally accepted definition, as well as biomarkers, for the proof of the "Syndrome after acute COVID-19" ("Prolonged COVID-19"), called by some "Long COVID". Therefore, it is defined by its symptoms and time frame of persistent COVID-19: duration of symptoms >12 weeks after onset of illness that cannot be explained by another illness and whose duration is not yet definitively known [5].

Long COVID is of particular concern among older people (aged 65 years or older), who are at greater risk than younger people of persistent symptoms associated with COVID-19. In addition, COVID-19 might trigger or exacerbate chronic conditions that occur commonly in older people, such as cardiovascular diseases, respiratory diseases,

neurodegenerative conditions, and functional decline.

Somatic health in the mental health of the elderly is very important. They suffer more than the young from depression and anxiety. Restrictions and isolation reduce social interactions, and the likelihood of losing a spouse or loved one during the pandemic may contribute to mental and physical decline [6].

This study aimed to investigate the differences in the types of treatment and post-COVID symptoms in the elderly versus young patients.

AIM OF THE STUDY

This study aimed to investigate the differences in the types of treatment and post-COVID symptoms in the elderly versus young patients

MATERIAL AND METHODS

Study design

This cross-sectional study aimed to investigate the disparities in treatments and post-COVID symptoms between elderly and young patients.

Inclusion and exclusion criteria

Patients included in this study suffered from COVID-19 between September 1, 2021, and September 1, 2022, and exhibited persistent symptoms related to the respiratory system post-recovery. Exclusion criteria involved patients without persistent respiratory symptoms or those who did not consent to participate in the study.

Protocol

Trained nurses conducted interviews with patients using a structured questionnaire to identify specific persistent or emerging symptoms after recovering from COVID-19. Independent doctors specializing in pulmonology categorized the patients' narratives based on the severity and nature of their symptoms.

Data analysis

Alternative non-parametric and correlation analyses were employed to analyze the data collected from the patient interviews. Logical units of observation were defined as two hundred patients who met the inclusion criteria.

Statistical analysis

Statistical analyses were performed to assess the differences in treatments and post-COVID symptoms between elderly and young patients. Various statistical measures such as mean, median, standard deviation, and correlation coefficients were calculated as appropriate.

This study was conducted in accordance with ethical guidelines and received approval from the relevant institution's review board. Informed consent was obtained from all participants before their inclusion in the study.

RESULTS

Our patient study included 200 people. The majority of those examined were women – 58.5% – compared to men – 41.5%. The largest group of respondents were within the age range of 31–40 years, followed by 51–60 years. The majority of respondents were unvaccinated – 68%. We cannot fail to note the positive fact that just 26% of the participants were active smokers (Table 1).

Table 1. Socio-demographic and clinical characteristics of the examined patients

Indicators	Number	%
Gender		
• Male	83	41.5
• Female	117	58.5
Age group		
• Up to 30	24	12
• 31–40	89	44.5
• 41–50	22	11
• 51–70	44	22
• Over 70	21	10.5
Smoking		
• Yes	52	26
• No	125	62.5
• Ex-smoker	23	11.5
Vaccinated		
• Yes	64	32
• No	136	68
Do you take any medication for accompanying diseases?		
• Yes	124	62
• No	76	38
Accompanying diseases		
• Pulmonary	19	9
• Neurological	17	8.5
• Endocrine	48	24
• Cardiovascular	87	43.5
• Musculoskeletal	10	5
• Oncological	13	6.5

It was found that the male gender was a factor influencing smoking (p=0.001, χ^2=46.52). The influence of the respondents' age on cardiovascular disease was investigated. Age turned out to be a key factor in the disease. As age increases, cardiac complaints also increase (p=0.001, χ^2=79.51). The correlation relationship was straight and significant (p=0.001, r=0.619).

There was also a similar relationship with accompanying diseases in patients, the leading place was occupied by diseases of the organs of blood circulation, followed by those of the endocrine system. With approximately the same percentage, the respondents indicated oncological, neurological, locomotor, and respiratory system diseases (Table 1).

In our study, the majority of patients who recovered from COVID-19 reported having one or more persistent symptoms. Only 1% had no residual complaints. Fatigue, cough, and shortness of breath were among the most commonly reported symptoms, followed by palpitations, memory problems, loss of smell and taste, anxiety, depression, "brain fog", insomnia, difficulty thinking and concentrating, and hair loss (Table 2).

Table 2. Number and types of symptoms in the examined/studied patients with COVID-19

Indicators	Yes (%) Number
Number of symptoms	
• 0	2(1)
• 1	29(14.5)
• 2	41(20.5)
• 3	60(30)
• 4	45(22.5)
• 5+	23(11.5)
Types of symptoms	
• tiredness	120(60)
• cough	103(51.5)
• fatigue	86(43)
• heart palpitations	58(29)
• memory problems	54(27)
• shortness of breath	42(21)
• loss of smell	41(20.5)
• loss of taste	34(17)
• anxiety and depression	19(9)
• "brain fog"	17(8.5)
• insomnia	12(6)
• hair loss	11(5.5)
• difficulty thinking and concentrating	10(5)

It was found that in elderly patients, the symptom of "fatigue" was observed more often compared to young patients (p=0.001, χ^2=11.03; p=0.001, r=0.205, respectively).

Also, a "cough" was strongly expressed in the elderly and young groups (p=0.001, χ^2=10.05; p=0.001, r=0.205, respectively).

In the studied group, "shortness of breath" was more often experienced by the elderly compared to young patients (p=0.001, χ^2=17.90; p=0.001, r=0.278, respectively).

Regarding the symptom of "hair loss", gender was found to have a key role in women (p=0.001; χ^2=5.04), as was the symptom "fatigue" (p=0.001; χ^2=9.60).

Regarding the dating of when the complaints appeared, 74% or the main part of our respondents indicated during the period of 1–3 months with the fewest complaints being observed 9–12 months after relapse (Table 3).

Table 3. Other important characteristics in the examined/studied patients with COVID-19

Indicators	%
How long after an illness did your complaints appear?	
• 1–3 month	74
• 3–6 month	17.5
• 6–9 month	6
• 9–12 month	2.5
During the illness, where did you receive treatment?	
• outpatient clinic	70.5
• hospital	29.5
Have you ever had pneumonia?	
• Yes	60
• No	40

The analysis of our study shows that the majority were treated on an outpatient basis, and the rest – 29.5% – received their treatment in a hospital (Table 3).

With increasing age, the treatments were carried out in a medical institution, in contrast to the young group (p=0.001, χ^2=37.59; p=0.001, r=0.430).

More than half (60%) of the respondents reported that they had suffered from pneumonia (Table 3).

In those who had suffered from pneumonia, the male gender was found to be an important factor (p=0.001; χ^2=5.77).

Discussion

The results of this study provide valuable insights into the demographic distribution, prevalence of comorbidities, and persistence of symptoms in individuals recovering from COVID-19. The sample size of 200 patients, with a majority of women (58.5%), allows for a comprehensive examination of the diverse factors influencing post-COVID outcomes.

Another study found that women with taller stature were more likely to develop long COVID syndrome [7].

One notable observation was the higher prevalence of unvaccinated individuals (68%) in the studied group. This underscores the importance of vaccinations in potentially mitigating the severity of post-COVID symptoms. It also raises questions about the role of vaccinations in preventing long-

term complications, a topic worthy of further investigation.

In this regard, an Israeli study found that, mainly in adults over 60 years of age, the occurrence of the most common symptoms of COVID significantly decreased, suggesting that vaccinations have a protective effect [8,9,10].

US veterans found that vaccinated people had a lower risk of long-lasting COVID at least 30 days after exposure compared to unvaccinated people [11].

Another study found that vaccination against SARS-CoV-2 was not associated with the onset of symptoms after COVID-19 more than 1 year after acute infection [12].

The influence of age on cardiovascular disease is a key finding, with a clear correlation between age and cardiac complaints. As age increases, the incidence of cardiovascular issues rises significantly, highlighting the importance of age-specific considerations in post-COVID care.

There was also a similar relationship between the accompanying diseases in patients, with the leading place being occupied by diseases of the organs of blood circulation, followed by those of the endocrine system (Table 1).

The study identifies a range of persistent symptoms post-COVID, with fatigue, coughing, and shortness of breath being the most prevalent [12,13,14, 15,16,17,18].

Interestingly, fatigue is noted more frequently in elderly patients, emphasizing the need for tailored interventions for this age group. The association of symptoms like "hair loss" and gender underscores the complex interplay of demographic factors in post-COVID symptomatology.

Furthermore, the temporal aspect of symptom manifestation reveals that the majority of respondents experienced complaints within 1–3 months after relapse, suggesting a relatively acute and subacute phase of persistent symptoms. This temporal information is crucial for understanding the trajectory of post-COVID complications and devising appropriate follow-up care strategies.

Limitation of study

Validity of future studies investigating the differences in treatments and post-COVID symptoms between elderly and young patients, contributing to a better understanding of the long-term impact of COVID-19 across different demographic groups.

Conclusion

In conclusion, this study underscores the multifaceted nature of post-COVID recovery, influenced by demographic factors, vaccination status, and the presence of comorbidities. The prevalence of persistent symptoms, their correlation with age and gender, and the temporal patterns of symptom manifestation provide a comprehensive picture of the challenges faced by individuals post-COVID.

These findings emphasize the importance of personalized and age-specific post-COVID care strategies. The study's insights into treatment modalities and the role of pneumonia in shaping post-COVID outcomes contributed to the growing body of knowledge necessary for effective healthcare planning and intervention. As the world continues to grapple with the aftermath of the pandemic, these results offer valuable guidance for healthcare professionals in tailoring their approaches to meet the diverse needs of individuals recovering from COVID-19.

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