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RESEARCH

Long COVID symptoms among outpatients with COVID-19: a descriptive study

Ayakta tedavi gören COVID-19 hastalarında uzamış COVID semptomları: tanımlayıcı bir çalışma

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Abstract

Purpose: The purpose of this study is to describe long COVID-19 symptoms in patients receiving outpatient treatment.

Materials and Methods: This prospective, observational, descriptive study was conducted in the COVID-19 clinic of a university hospital in February-May 2022. Patients who applied to the outpatient clinic and were diagnosed with COVID-19 were included in the study. Patients were follow up for prolonged COVID-19 symptoms for a 12-week period. It was investigated whether there was a relationship between long COVID-19 symptoms frequency and gender, age and blood type.

Results: At least one long COVID symptom was observed in 23% of 7139 patients included in the study. Myalgia was the most common symptom detected in 4.33% of all patients. Cough and loss of taste/smell were the most common symptoms in women, and dizziness in men. The frequency of 26 of 29 symptoms varied with age. While the symptoms most affected by the Body Mass Index were peripheral neuropathy and tinnitus, the least affected symptoms were loss of taste/smell, anxiety and depression.

Conclusion: Long COVID symptoms were widely detected in COVID-19 outpatients. Age, gender and BMI may be factors affecting long COVID symptoms.

Keywords:. Covid-19, Long COVID symptoms, outpatient treatment, pandemic

Öz

Amaç: Bu çalışmanın amacı ayaktan tedavi ve takip alan hastalarda uzamış COVID-19 semptomlarını tanımlamaktır.

Gereç ve Yöntem: Bu prospektif, gözlemsel, tanımlayıcı çalışma, Şubat-Mayıs 2022'de bir üniversite hastanesinin COVID-19 kliniğinde gerçekleştirildi. Polikliniğe ayaktan başvuran ve tanıları polimeraz zincir reaksiyonu (PCR) testi ile doğrulanan hastalar çalışmaya alındı. Hastalar 12 haftalık bir süre boyunca uzamış COVID-19 semptomları açısından takip edildi. Uzamış COVID-19 semptom sıklığı ile cinsiyet, yaş ve kan grubu arasındaki ilişki araştırıldı.

Bulgular: Çalışmaya alınan 7139 hastanın 1701'inde (%23,8) en az bir uzamış COVID semptomu gözlendi. Ayaktan takip edilen tüm COVID-19 hastalarında en sık görülen semptom miyaljiydi (%4,33). Cinsiyete göre semptomlar incelendiğinde, öksürük ve tat/koku kaybının kadınlarda ve baş dönmesinin erkeklerde en sık görülen uzun süreli COVID semptomu olduğu izlendi Vücut kitle indeksi ile ilişkisi incelendiğinde, en belirgin değişkenlik gösteren semptomların periferik nöropati ve kulak çınlaması olduğu, en az değişkenlik gösterenlerin ise tat/koku kaybı, anksiyete ve depresyon olduğu görüldü.

Sonuç: Bu çalışmada ayaktan tedavi gören COVID-19 hastalarında uzun süreli COVID semptomları yaygın olarak saptanmıştır. Yaş, cinsiyet, VKİ ve kan grubu, hastalarda gelişen uzun süreli COVID semptomlarını etkileyen faktörler olabilir.

Anahtar kelimeler: Covid-19, uzamış COVID semptomları, ayakta tedavi, pandemi

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INTRODUCTION

COVID-19 emerged as a pneumonia outbreak caused by a novel coronavirus species in the Chinese city of Wuhan in the province of Hubei in December 2019, following which it led to severe disease and mortality worldwide[1-4]. It was declared a global pandemic on 11 March, 2020, and a 'Public Health Emergency of International Concern' by the World Health Organization (WHO) on 30 January, 2020[2-3].

Numerous studies have been conducted since the emergence of the pandemic on its effects on human health, methods of protection, and treatment, and significant progress has been made[5-7]. However, in later stages of the pandemic it began to be realized that the process was becoming prolonged in some patients, with some symptoms and findings becoming chronic[8-9]. There was still no common language for describing these prolonged symptoms in the wake of COVID-19. However, terms such as "long-haulers" and "long/post-COVID" began being employed for patients who had undergone COVID-19 and presented with different prolonged symptoms[10]. Despite various differences in this nomenclature, the most widely accepted terms are now ongoing COVID for symptoms lasting from 4-12 weeks, post-COVID syndrome for those lasting longer than 12 weeks, and long COVID, which includes both, for patients with symptoms exceeding four weeks in duration (including those longer than 12 weeks)[11]. Numerous recent studies have investigated what these prolonged symptoms may be, although an important part of these studies have been performed with hospitalized patients subjected to close clinical follow-up[9-11]. However, the number of studies of prolonged COVID-19 symptoms in patients with a generally good condition followed-up on an outpatient basis is relatively small, and the appearance of new, unidentified long COVID symptoms is described as likely in the population receiving outpatient treatment[11]. The nature of these prolonged symptoms, particularly in patient groups diagnosed with COVID-19 and treated as outpatients, is therefore still unclear. The identification of all long COVID symptoms, which may appear in the differential diagnosis of other diseases and increasing numbers of which may be expected to pose an additional burden on the health system, is therefore of primary importance.

The purpose of this study was therefore to identify prolonged COVID-19 symptoms in patients followed-up on an outpatient basis due to COVID-19.

MATERIALS AND METHODS

This prospective, observational study was performed in the COVID-19 clinic of a 1200-bed university hospital in a Turkish city with a population of 4 million between February and May 2022. This clinic has been serving as a COVID-19 clinic since the beginning of the pandemic in a region serving a population of approximately 1 million and that received an average of 400 patient presentations a day during the study period. Before starting, ethical approval was obtained from the non-interventional research ethics committee of Izmir Katip Çelebi University, which is the hospital's local ethics committee (dated 21.10.2021 and numbered 0425). Consent was obtained from all article participants.

Research hypotheses were examined in detail in the study to identify long-term symptoms of COVID-19 in patients receiving outpatient treatment and follow-up. For this purpose, it was carried out in the COVID-19 clinic of the university hospital between February and May 2022. Patients who applied to the outpatient clinic and were diagnosed with COVID-19 were included in the study.

In the study, it was investigated whether there was a relationship between the frequency of COVID-19 symptoms and gender, age and blood group in the evaluations made for patients diagnosed with COVID-19, and the minimum significant relationship was found between the blood groups of COVID-19 symptoms. As a result, the effect size was calculated for 1701 people included in the study (w=0.152)*. As a result of the effect size of 1701 people and 0.152, the statistical power of the study was found to be 80.5% with a 5% significance level.

Study population

All patients over the age of 18 who applied to our hospital's COVID-19 clinic with fever, sore throat, cough, myalgia, runny nose, loss of taste and smell, symptoms of vomiting, diarrhea and shortness of breath, and a history of contact and positive polymerase chain reaction (PCR) test results were included in the study. Patients with known heart failure, or chronic and obstructive pulmonary disease capable of causing shortness of breath, with known rhythm disorders, valve pathologies, and heart failure causing chronic palpitation and chest pain, with

known cognitive function disorder, who were hospitalized due to COVID-19 follow-up, or who subsequently died, and patients who could not be contacted and followed-up for various reasons were excluded from the study.

Study protocol

The name, age, gender, contact details, and all symptoms during presentation of patients with positive PCR tests and meeting the inclusion criteria throughout the study were recorded onto presentation forms. Patients registered in the study were followed-up over a 12-week period through the hospital record system and by telephone. In line with the definition of long COVID, patients with prolonged or newly developed symptoms lasting more than four weeks (11) and other possible additional long COVID symptoms, as shown in Table 1, were identified. These patients' age, sex, height, weight, chronic disease status, medication history, prolonged symptoms, and newly added symptoms, if applicable, were recorded. Additional tests, therapeutic regimens, and developing complications were recorded from the hospital record system, while patients whose treatment continued in other hospitals were followed-up through the national health record system, and the data were recorded.

Statistical analysis

The study data were analyzed using IBM SPSS Statistics Standard Concurrent User version 26 software (IBM Corp., Armonk, New York, USA). Descriptive statistics were presented as number (*n*), percentage (%), median (*M*), and interquartile range (*IQR*) values. Normality of distribution of numerical variable data was evaluated using the Shapiro Wilk test. Differences between two independent samples were compared using the Mann-Whitney *U* test. Comparisons between three or more groups were performed using the Kruskal Wallis H test. Pearson's and Fisher's exact tests were applied in the comparison of categorical variables. p values <0.05 were regarded as statistically significant.

Table 1. Common symptoms of long COVID-19 syndrome

Respiratory symptoms Breathlessness Cough	Cardiovascular symptoms Chest tightness Chest pain Palpitations
Generalized symptoms Fatigue Fever Pain	Neurological symptoms Cognitive impairment ('brain fog', loss of concentration or memory issues) Headache Sleep disturbance Peripheral neuropathy symptoms (pins and needles and numbness) Dizziness Delirium (in older populations)
Gastrointestinal symptoms Abdominal pain Nausea Diarrhea Anorexia and reduced appetite (in older populations)	Musculoskeletal symptoms Joint pain Muscle pain
Psychological/psychiatric symptoms Symptoms of depression Symptoms of anxiety	Ear, nose and throat symptoms Tinnitus Earache Sore throat Dizziness Loss of taste and/or smell
Dermatological symptoms Skin rashes	

RESULTS

The number of PCR-positive patients presenting as outpatients to the COVID-19 clinic during the three-month study period was 7947. Seventy-eight of these patients with chronic obstructive/restrictive pulmonary disease, 115 with cardiac chest pain, rhythm disorders, symptomatic valve pathologies, and heart failure, 24 with known cognitive function disorder, 68 hospitalized due to COVID-19, and 532 who died during follow-up, who could not be contacted for various reasons, or who could not be followed-up were excluded. Long COVID symptoms at least one of which exceeded four weeks in duration were observed in 1701 (23.8%) of the 7139 patients followed-up. The most common long COVID symptom observed in the patients was myalgia, representing approximately 18% of such symptoms. Myalgia was observed in 4.33% of all patients receiving outpatient COVID-19 follow-up. Long COVID symptoms observed in the patients and their frequencies were presented and classified on the basis of systems in Table 2. When long COVID symptoms were classified on the basis of systems, the most frequent symptoms involved the respiratory system, and these constituted 23% of all long COVID symptoms. Long COVID symptoms associated with the respiratory system were observed in 5.4% of all COVID-19 patients treated as outpatients.

Investigation of whether gender has any effect on the development of long COVID symptoms revealed a gender difference in the distributions of some such symptoms (Table 3). For example, cough was more common in women and dizziness in men, while the loss of taste/smell symptom was more frequently encountered in women.

Table 2. Distributions of long COVID symptoms according to systems

System		**n**	**Percentage among all long COVID symptoms**	**Percentage among all COVID-19 Patients (7139)**
Respiratory symptoms	Breathlessness	206	12.1 %	2.8 %
	Cough	186	10.9 %	2.6 %
Cardiovascular symptoms	Chest tightness / Chest pain	97	5.7 %	1.3 %
	Palpitations	27	1.5 %	0.3 %
Generalized symptoms	Weakness/fatigue	224	13.1 %	3.1 %
	Joint pain	65	3.8 %	0.9 %
Neurological symptoms	Cognitive Impairment	5	0.29 %	0.07 %
	Forgetfulness	14	0.8 %	0.19 %
	Headache	93	5.4 %	1.3 %
	Insomnia	1	0.05 %	0.01 %
	Dizziness	32	1.8 %	0.44 %
	Peripheral Neuropathy Symptoms	5	0.29 %	0.07 %
Gastrointestinal symptoms	Abdominal Pain	172	9.9 %	2.4 %
	Nausea	15	0.8 %	0.21 %
	Diarrhea	7	0.4 %	0.09 %
Genitourinary system	Menstrual Irregularity (female)	13	1.6 %	0.37 %
	Erectile Dysfunction (male)	2	0.22 %	0.05 %
	Painful Urination	6	0.3 %	0.08 %
Musculoskeletal symptoms	Myalgia	309	18.1 %	4.33 %
	Osteoarthritis	2	0.1 %	0.02 %
Psychological/psychiatric symptoms	Anxiety	4	0.2 %	0.05 %
	Depression	2	0.1 %	0.02 %
Eye, Ear, nose, and throat symptoms	Tinnitus	4	0.2 %	0.05 %
	Earache	28	1.6 %	0.39 %
	Sore throat	88	5.1 %	1.23 %
	Loss of taste/smell	5	0.2 %	0.07 %
	Nasal obstruction	18	1 %	0.25 %
	Stinging/itching in the eyes	6	0.3 %	0.08 %
Dermatological symptoms	Skin rashes	65	3.8 %	0.9 %
Total		1701	100 %	23 %

Table 3. A comparison of long COVID symptoms by gender

		Gender		Total	χ^2	p
		Female	Male			
Breathlessness	n	98_a	108_a	206	45.65	0.019
	%	47 %	52 %	100 %		
Cough	n	98_a	88_b	186		
	%	52 %	47 %	100 %		
Chest pain	n	52_a	45_a	97		
	%	53 %	46 %	100 %		
Palpitations	n	8_a	19_a	27		
	%	29 %	70 %	100 %		
Weakness/fatigue	n	106_a	118_a	224		
	%	47 %	53 %	100 %		
Joint pain	n	23_a	42_a	65		
	%	35 %	65 %	100 %		
Cognitive Impairment	n	4_a	1_a	5		
	%	80 %	20 %	100 %		
Forgetfulness	n	4_a	10_a	14		
	%	29 %	71 %	100 %		
Headache	n	43_a	50_a	93		
	%	46 %	54 %	100 %		
Insomnia	n	1_a	0_a	1		
	%	100 %	0 %	100 %		
Dizziness	n	9_a	23_b	32		
	%	28 %	72 %	100 %		
Peripheral Neuropathy Symptoms	n	1_a	4_a	5		
	%	20 %	80 %	100 %		
Abdominal pain	n	72_a	100_a	172		
	%	42 %	58 %	100 %		
Nausea	n	6_a	9_a	15		
	%	40 %	60 %	100 %		
Diarrhea	n	4_a	3_a	7		
	%	57 %	43 %	100 %		
Menstrual irregularity	n	3_a	10_a	13		
	%	23 %	77 %	100 %		
Erectile dysfunction	n	2_a	0_a	2		
	%	100 %	0 %	100 %		
Painful urination	n	3_a	3_a	6		
	%	50 %	50 %	100 %		
Myalgia	n	132_a	177_a	309		
	%	43 %	57 %	100 %		
Osteoarthritis	n	0_a	2_a	2		
	%	0 %	100 %	100 %		
Anxiety	n	1_a	3_a	4		
	%	25 %	75 %	100 %		
Depression	n	2_a	0_a	2		
	%	100 %	0 %	100 %		
Tinnitus	n	1_a	3_a	4		
	%	25 %	75 %	100 %		
Earache	n	11_a	17_a	28		
	%	39 %	61 %	100 %		
Sore throat	n	40_a	48_a	88		
	%	46 %	55 %	100 %		
Loss of taste/smell	n	5_a	0_b	5		
	%	100 %	0 %	100 %		
Nasal obstruction	n	12_a	6_a	18		
	%	67 %	33 %	100 %		
Stinging/itching in the eyes	n	3_a	3_a	6		
	%	50 %	50 %	100 %		
Skin rashes	n	30_a	35_a	65		
	%	46 %	54 %	100 %		

χ^2: Chi-square test (Monte Carlo Exact 2-Sided)

Examination of the relationship between long COVID symptoms and age revealed that the incidence of some symptoms changed significantly in an age-dependent manner (H=31,278; p <0.001). Only insomnia, depression, and loss of taste/smell exhibited no significant difference in terms of age among the 29 symptoms investigated, the other 26 exhibiting significant variation. The symptom exhibiting the greatest association with age was forgetfulness (Figure 1).

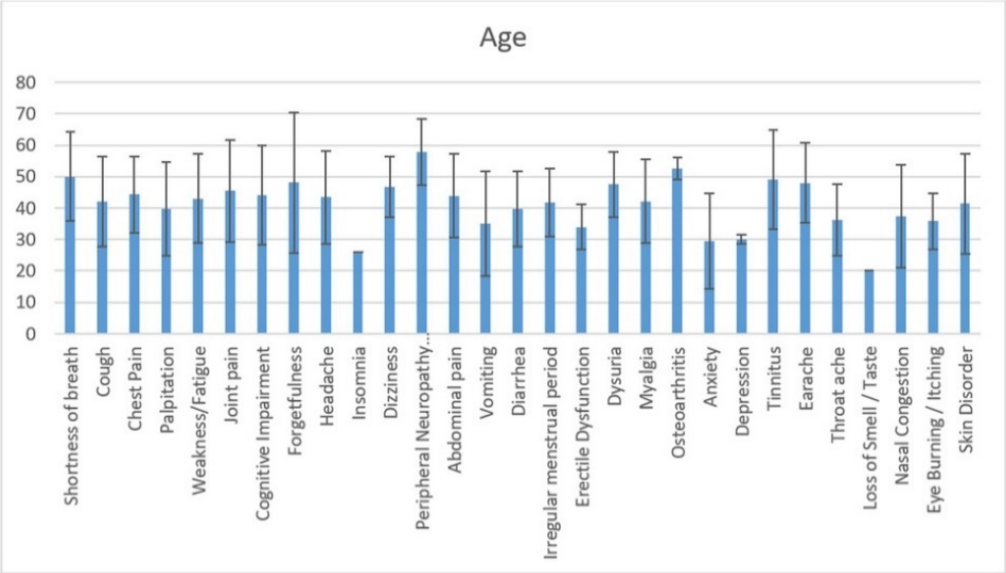

Figure 1. Distribution of symptoms by age.

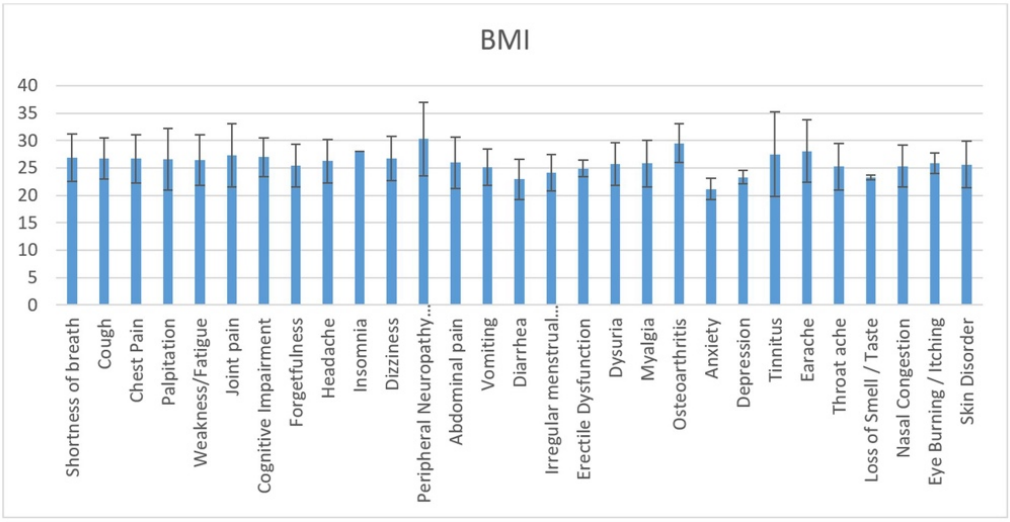

Figure 2. Distribution of symtpms by body mass index

Table 4. A comparison of long COVID symptoms by blood groups

Symptom			Blood Group								Total	χ^2	p
			0 rh+	0 rh-	A rh+	A rh-	B rh+	B rh-	AB rh+	AB rh-			
Symptom	Breathlessness	n	$45_{a,b,c}$	$29_{a,b,c}$	55_{c}	26_{b}	$18_{a,c}$	$8_{a,b,c}$	$21_{a,c}$	$4_{a,b,c}$	206	248	0.007
		%	22 %	14 %	27 %	13 %	9 %	3 %	10 %	2 %	100 %		
	Cough	n	34_{a}	24_{a}	60_{a}	10_{a}	26_{a}	6_{a}	21_{a}	5_{a}	186		
		%	18 %	13 %	30 %	6 %	14 %	2 %	12 %	2 %	100 %		
	Chest pain	n	28_{a}	$13_{a,b}$	$27_{a,b}$	4_{b}	$11_{a,b}$	2_{c}	$11_{a,b}$	$1_{a,b}$	97		
		%	29 %	13 %	28 %	4 %	11 %	2 %	11 %	1 %	100 %		
	Palpitation	n	$7_{a,b,c}$	1_{c}	15_{b}	$0_{a,b,c}$	$1_{a,c}$	$0_{a,b,c}$	$3_{a,b,c}$	$0_{a,b,c}$	27		
		%	27 %	4 %	54 %	0 %	4 %	0 %	12 %	0 %	100 %		
	Weakness/fatigue	n	32_{a}	$27_{a,b}$	65_{a}	15_{a}	$30_{a,b}$	$5_{a,b}$	42_{b}	$8_{a,b}$	224		
		%	15 %	12 %	29 %	6 %	14 %	2 %	18 %	4 %	100 %		
	Joint pain	n	19_{a}	$7_{a,b}$	$19_{a,b}$	$4_{a,b}$	$10_{a,b}$	$0_{a,b}$	4_{b}	$2_{a,b}$	65		
		%	28 %	11 %	30 %	6 %	16 %	0 %	6 %	3 %	100 %		
	Cognitive Impairment	n	$1_{a,b}$	$0_{a,b}$	0_{b}	2_{a}	2_{a}	$0_{a,b}$	$0_{a,b}$	$0_{a,b}$	5		
		%	20 %	0 %	0 %	40 %	40 %	0 %	0 %	0 %	100 %		
	Forgetfulness	n	2_{a}	3_{a}	3_{a}	1_{a}	2_{a}	1_{a}	2_{a}	0_{a}	14		
		%	14 %	21 %	21 %	7 %	14 %	7 %	14 %	0 %	100 %		
	Headache	n	21_{a}	9_{a}	24_{a}	3_{a}	11_{a}	10_{b}	13_{a}	$2_{a,b}$	93		
		%	22 %	10 %	26 %	3 %	12 %	11 %	14 %	2 %	100 %		
	Insomnia	n	0_{a}	0_{a}	1_{a}	0_{a}	0_{a}	0_{a}	0_{a}	0_{a}	1		
		%	0 %	0 %	100 %	0 %	0 %	0 %	0 %	0 %	100 %		
	Dizziness	n	$6_{a,b,c,d}$	$2_{c,d}$	$6_{c,d}$	$6_{c,d}$	$5_{a,b,c,d}$	$1_{a,b,c,d}$	$6_{a,b,c,d}$	$0_{a,b,c,d}$	32		
		%	19 %	6 %	19 %	19 %	16 %	3 %	19 %	0 %	100 %		
	Peripheral Neuropathy Symptoms	n	1_{a}	0_{a}	3_{a}	0_{a}	1_{a}	0_{a}	0_{a}	0_{a}	5		
		%	20 %	0 %	60 %	0 %	20 %	0 %	0 %	0 %	100 %		
	Abdominal pain	n	$33_{a,b,c}$	$25_{a,b,c}$	42_{c}	20_{b}	$18_{a,c}$	$5_{a,b,c}$	$28_{a,b}$	$1_{a,c}$	172		
		%	20 %	15 %	23 %	12 %	11 %	3 %	17 %	0.6%	100 %		
	Nausea	n	2_{a}	3_{a}	4_{a}	3_{a}	1_{a}	0_{a}	2_{a}	0_{a}	15		
		%	13 %	20 %	27 %	20 %	7 %	0 %	13 %	0 %	100 %		
Symptom	Diarrhea	n	2_{a}	0_{a}	1_{a}	0_{a}	1_{a}	$0_{a,b}$	1_{a}	2_{b}	7	248	0.007
		%	29 %	0 %	14 %	0 %	14 %	0 %	14 %	28 %	100 %		
	Menstrual irregularity	n	1_{a}	1_{a}	6_{a}	0_{a}	1_{a}	0_{a}	4_{a}	0_{a}	13		
		%	8 %	8 %	46 %	0 %	8 %	0 %	31 %	0%	100 %		
	Erectile dysfunction	n	1_{a}	0_{a}	0_{a}	0_{a}	1_{a}	0_{a}	0_{a}	0_{a}	2		
		%	50 %	0 %	0 %	0 %	50 %	0 %	0 %	0%	100 %		
	Painful urination	n	$2_{a,b}$	0_{b}	1_{b}	$0_{a,b}$	$2_{a,b}$	$0_{a,b}$	0_{b}	1_{a}	6		
		%	33 %	0 %	17 %	0 %	33 %	0 %	0 %	17 %	100 %		
	Myalgia	n	48_{a}	$34_{a,b}$	$92_{a,b}$	$21_{a,b}$	$50_{b,c}$	18_{c}	$35_{a,b}$	$10_{a,b,c}$	309		
		%	16 %	11 %	30 %	7 %	16 %	6 %	11 %	3%	100 %		
	Osteoarthritis	n	1_{a}	0_{a}	0_{a}	0_{a}	0_{a}	0_{a}	1_{a}	0_{a}	2		
		%	50 %	0 %	0 %	0 %	0 %	0 %	50 %	0%	100 %		
	Anxiety	n	0_{a}	0_{a}	2_{a}	1_{a}	1_{a}	0_{a}	0_{a}	0_{a}	4		
		%	0 %	0 %	50 %	25 %	25 %	0 %	0 %	0%	100 %		
	Depression	n	$1_{a,b}$	$0_{a,b}$	0_{b}	1_{a}	$0_{a,b}$	$0_{a,b}$	$0_{a,b}$	$0_{a,b}$	2		
		%	50 %	0 %	0 %	50 %	0 %	0 %	0 %	0%	100 %		
	Tinnitus	n	2_{a}	0_{a}	2_{a}	0_{a}	0_{a}	0_{a}	0_{a}	0_{a}	4		
		%	50 %	0 %	50 %	0 %	0 %	0 %	0 %	0%	100 %		
	Earache	n	5_{a}	4_{a}	10_{a}	2_{a}	2_{a}	0_{a}	4_{a}	1_{a}	28		
		%	18 %	14 %	36 %	7 %	7 %	0 %	14 %	4 %	100 %		
	Sore throat	n	$14_{a,b,c,d}$	$14_{c,d}$	$37_{b,d}$	0_{c}	$9_{a,b,c,d}$	$0_{a,c}$	$11_{a,b,c,d}$	$2_{a,b,c,d}$	87		
		%	16 %	16 %	43 %	0 %	10 %	0 %	13 %	2. %	100 %		
	Loss of smell/taste	n	0_{a}	0_{a}	5_{a}	0_{a}	0_{a}	0_{a}	0_{a}	0_{a}	5		
		%	0 %	0 %	100 %	0 %	0 %	0 %	0 %	0%	100 %		
	Nasal obstruction	n	5_{a}	1_{a}	7_{a}	2_{a}	1_{a}	0_{a}	0_{a}	0_{a}	16		
		%	31 %	6 %	44 %	13 %	6 %	0 %	0 %	0%	100 %		
	Stinging /itching in the eyes	n	2_{a}	0_{a}	3_{a}	0_{a}	1_{a}	0_{a}	0_{a}	0_{a}	6		
		%	33 %	0 %	50 %	0 %	17 %	0 %	0 %	0%	100 %		
	Skin rashes	n	14_{a}	12_{a}	15_{a}	5_{a}	7_{a}	3_{a}	6_{a}	2_{a}	64		
		%	22 %	19 %	23 %	8 %	11 %	5 %	9 %	3%	100 %		

$\chi 2$: chi-square test (Monte Carlo Exact 2-Sided)

Investigation of the link between long COVID symptoms and body mass index (BMI) showed that the prevalence of some symptoms changed significantly depending on BMI (F=1,882; p: 0,004). The symptoms exhibiting the greatest variation depending on BMI were peripheral neuropathy and

tinnitus, while those with the least variation were loss of taste/smell, anxiety, and depression (Figure 2).

Analysis revealed a statistically significant association with long COVID symptoms between some blood groups. For example, shortness of breath was more common in ARh+ patients compared to ARh-, chest pain was more common in 0Rh+ patients compared to, palpitation was more common in ARh+ than 0Rh-, fatigue/weakness was less common in ABrh+ than in Arh+ and more common than in Arh-, while joint pain was more common in 0rh+ patients than in ABrh+ patients (Table 4). Significant differences were also observed between blood groups in terms of blurred consciousness, headache, abdominal pain, diarrhea, painful urination, myalgia, depression, and sore throat.

DISCUSSION

Several long COVID symptoms have previously been described, particularly in hospitalized patients and those admitted to intensive care[9-1]. However, there are major inconsistencies among studies in terms of the prevalence of these symptoms and factors provoking their emergence[11-13]. The prevailing opinion is that there may be several symptoms that are still undescribed and likely to be associated with long COVID, apart from these defined symptoms and those set out in the NICE guideline[11]. The present research is one of the rare studies investigating long COVID symptoms in patients with COVID-19 treated on an outpatient basis, who are frequently overlooked. Additionally, the identification of preciously undescribed symptoms with the potential to be associated with long COVID represents an important distinguishing feature between the present and previous studies. Based on the results of this study, the most frequently observed long COVID symptom was myalgia, constituting 18.2% of all long COVID symptoms and seen in 4.3% of all patients diagnosed with COVID-19. The second most common long COVID symptom was weakness/fatigue. In terms of systems, symptoms associated with the respiratory system were most frequently observed, in the form of dyspnea and cough. Respiratory system symptoms represented 23% of all long COVID symptoms, and were observed in 5.4% of all COVID-19 patients. Fever, delirium, and decreased appetite/anorexia symptoms frequently reported in hospitalized patients were not observed as long COVID symptoms in any outpatients in the present study. The symptoms of nasal obstruction and itching/stinging in the eyes that had not been reported in other studies were determined at rate of 0.25% and 0.08%, respectively, among the outpatients in the COVID population in this study. Examination of characteristics potentially capable of provoking long COVID symptoms revealed that cough and loss of taste/smell were seen significantly more frequently in women, and dizziness in men. All symptoms apart from insomnia, depression, and loss of taste/smell increased significantly with age. Patients' BMI values also affected long COVID symptoms, the most pronounced increases in line with BMI being observed in peripheral neuropathy and tinnitus. Blood groups were also identified as a factor affecting long COVID symptoms, with 14 of the 29 symptoms varying on the basis of blood groups.

It has previously been reported that many people can experience general body pain, fatigue, persistent high body temperature, and psychiatric problems following COVID-19[11]. The occurrence of long COVID symptoms even in individuals who can be described as young and healthy and the fact that not all the effects are fully known represents a risk in terms of community health. An increase in hospital presentations may therefore be expected as time passes. Since the majority of studies examining long COVID symptoms have involved severe, hospitalized cases, neither the entirety of the symptoms nor their prevalences have been fully detailed. Long COVID symptoms are thought to be experienced by many more individuals than anticipated, and the number is expected to rise in line with the number of individuals experiencing the disease[14]. In a cohort study by Davis et al., symptoms exceeded six months in duration in 65% of individuals with long COVID symptoms, with fatigue being present in 77% of these patients, weakness after exercise in 72.2%, and cognitive function impairment in 55.4%[15]. The most frequently seen long COVID symptom in Sudre et al.'s study was fatigue, with headache, anosmia, and lower airway symptoms also being reported as major complications[16]. Myalgia and weakness/fatigue symptoms in the present research were observed at similar rates to these studies, while cough and abdominal pain symptoms were more frequent than in those studies. Some of these differences in COVID symptoms may be attributable to the fact that the period in which our study was conducted was different to other studies, and the prevailing strains

were therefore also different.

A general evaluation of these findings shows that the most common symptoms encountered in routine emergency department and clinic operations are at the same time highly similar to long COVID symptoms. This in turn shows that long COVID now needs to take its place in the differential diagnosis of causes underlying these.

The biggest limitation of this study is that it is single-centered. In addition, the inability to access information about symptoms that may have occurred in patients who could not be included or reached due to being retrospective is an important limitation.

Twenty-nine distinct long-COVID symptoms were identified in this study, at least one of which was observed in 23% of the PCR-positive COVID-19 patient population. The most common of these symptoms were myalgia and weakness/fatigue, although nasal obstruction and stinging/itching in the eyes, which had not previously been described, were also identified as symptoms associated with long COVID. Age, sex, BMI, and blood group may be factors involved in the development and prevalence of long COVID symptoms.

Physicians must have an understanding of long COVID symptoms that impair patients' quality of life and cause repeated presentations to health institutions. Further studies with longer observation periods and larger populations on the subjects of identifying all long COVID patients, eventual clinical outcomes, and probable therapeutic regimens are now needed.

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