

Risk Factors Related to Postcovid–19 Syndrome in Residents from Pinar Del Río

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Abstract

Introduction: The chances of suffering from post-COVID-19 syndrome grow as the pandemic expands. **Objective:** Determine the influence of the different risk factors for the appearance of post-COVID 19 syndromes at the Turcios Lima Polyclinic. **Methods:** A case-control study was carried out in 2022. Patients treated at the Turcios Lima Polyclinic in the multidisciplinary consultation for convalescents with this disease were taken as the study universe. Patients were included randomly 1:2 (100 cases/200 controls). A survey was administered to these patients in their medical consultations, as well as to the controls, with prior informed consent. The statistical analysis was based on a univariate strategy, which consisted of determining the odds ratio (OR) for each risk factor, as well as estimating their 95% confidence intervals (95% CI) and the x2 test. with a level of statistical significance of $P < 0.05$. **Results:** The most frequent risk factors were: female sex, associated comorbidities, pharmacological treatment, ventilatory support, the presence of established sequelae and developed complications. **Conclusions:** Despite identifying the most frequent risk factors, they continue to be a challenge for health professionals. **Recommendations:** Carry out epidemiological studies on the risk factors of post-COVID 19 syndromes.

Keywords: Post-COVID 19 syndromes; risk factors; epidemic; case-control study

Introduction

Post-COVID-19 syndrome is defined by the persistence of clinical signs and symptoms that arise during or after suffering from COVID-19 (4 weeks), remain for more than 12 weeks and are not explained by an alternative diagnosis. Symptoms may fluctuate or cause flares.¹⁻³ The term 'long COVID' is commonly used to describe signs and symptoms that continue or develop after acute COVID-19, and includes both Ongoing symptomatic COVID-19 as post-COVID-19 syndrome.⁴⁻⁶

Factors that explain the heterogeneity of the post-COVID-19 syndrome have been described: Residual symptoms. Damage/sequelae of multiple organs. Consequence of prolonged hospitalization. Consequence of residual inflammation. Worsening of previous comorbidities. Chronic Fatigue Syndrome. Post-traumatic stress disorder. Psychosocial effect of confinement/social isolation.⁷⁻⁹ 4 different categories are described (Cochrane): Symptoms that persist from the acute phase. Symptoms

associated with a new disease. Late-onset symptoms, arising at the end of the acute phase. Impact on a previous pathology or disability.¹⁰⁻¹²

Long-term consequences are also described (NICE): Acute COVID-19 (4 weeks). Ongoing symptomatic COVID-19 (4 to 12 weeks). Post-COVID-19 syndrome (persistence of clinical signs and symptoms that remain for more than 12 weeks)¹³⁻¹⁵

Post-COVID-19 syndrome affects most of the body's organs and systems, producing respiratory, cardiovascular, neurological, cognitive, psychiatric, gastrointestinal and systemic symptoms.¹⁶⁻¹⁸

A large number of factors influence: age, the presence of comorbidities, the type of acute infection, the complications developed, the established sequelae, the far treatments.

	CASOS N=100		CONTROLES N=200		OR	IC	X2
Variables	No	%	No	%			
Edad							
< 50 años	35	35,0	75				
> 50 años	65	65,0	125	75,06	0,90	0,54-1,48	0,18

							(P>0,05)
Sexo							
Masculino	29	29,0	40	61,70			
Femenino	71	71,0	160	38,3	1,63	0,94-2,84	3,05 (P>0,05)
Zona de residencia							
Urbana	71	71,0	175	75,40	3,06	0,36-25,79	509,03 (P<0,001)
Rural	29	29,0	25	24,60			
Ocupación (Estudia o trabaja)							
Si	60	60,0	15	78,75	2,63	2,29-3,02	199,93 (P<0,001)
No	40	40,0	25	21,25			

Tabla 1. Factores sociodemográficos. Policlínico Turcios Lima. Año 2022.

Table 2 shows the factors related to the associated comorbidities, where diabetes mellitus was a risk factor related to the onset of the disease more than 4 times (OR=4.82), (CI 1.63-14.29), (P< 0.001), followed by bronchial asthma and COPD more than 3 times (OR=3.89), (CI 1.71-8.86), (P<0.001),

being highly significant, Ischemic heart disease more than 2 times (OR =2.35), (CI 0.96-5.73), (P<0.05), HTN 1.49 times (OR=1.49), (CI 0.90-2.47), (P>0.05).

	CASOS		CONTROLES		OR	IC	X2
Variables	N =100	%	N =200	%			
HTA							
Si	39	39	60	30,0	1,49	0,90-2,47	2,44 (P>0,05)
No	61	61	140	70,0			
DM							
Si	11	11	5	2,5	4,82	1,63-14,29	9,54 (P<0,001)
No	89	89	195	97,5			
CI							
Si	11	11	10	5,0	2,35	0,96-5,73	3,69 (P>0,05)
No	89	89	190	95,0			
AB							
Si	17	17	10	5,0	3,89	1,71-8,86	11,72 (P<0,001)
No	83	83	190	95,5			
EPOC							
Si	8	8	5	2,5	3,39	1,08-10,65	4,86 (P<0,05)
No	92	92	195	97,5			
Obesidad							
Si	40	40	90	45,0	0,81	0,52-1,33	0,68 (P>0,05)
No	60	60	110	55,0			

Tabla 2. Factores relacionados con comorbilidades asociadas. Policlínico Turcios Lima. Año 2022.

Legend: HBP (High Blood Pressure), DM (Diabetes Mellitus), IHD (ischemic heart disease), Bronchial Asthma (BA), COPD (Chronic Obstructive Pulmonary Disease).

Table 3 shows the factors related to the clinical characteristics, where neither the type of infection, nor the duration of symptoms, nor the severity of the condition constituted risk factors related to the appearance of post-COVID 19 syndromes, being highly significant.

	CASOS N=100		CONTROLES N=200		OR	IC	X2
Variables	No	%	No	%			
Tipo de infección							
Leve	95	95,0	200	100,0	0,00	0,00-0,02	0,18 (P<0,001)
Severa o Crítica	5	5,0	0	0,0			
Duración de los síntomas							
< 12 semanas	2	2,0	170	85,0			
>12 semanas	98	98,0	30	15,0	0,00	0,00-2,02	187,75 (P<0,001)
Gravedad del cuadro							
< 5 síntomas	50	50,0	170	85,0			
> 5 síntomas	50	50,0	30	0,18	0,18	0,10-0,31	41,76 (P<0,001)

Tabla 3. Factores relacionados con las características clínicas. Policlínico Turcios Lima. Años 2022.

Table 4 shows the factors related to medical behavior, where the need for medical treatment and ventilatory support through oxygen therapy constituted risk factors related to the appearance of post-COVID 19 syndrome more than 5 times (OR=5.35). (CI 1.82-15.55), (P< 0.001), both having a very similar behavior, being highly significant.

	CASOS N=100		CONTROLES N=200		OR	IC	X2
Variables	No	%	No	%			
Ingreso hospital							
Si	32	32,0	25	12,5	0,30	0,17-0,55	16,47 (P<0,001)
No	68	68,0	175	87,5			
Tratamiento farmacológico							
Si	12	12,0	5	5,0	5,35	1,82-15,55	11,26 (P<0,001)
No	88	88,0	195	97,5			
Soporte ventilatorio							
Si	12	12,0	5	5,0	5,35	1,82-15,55	11,26 (P<0,001)
No	88	88,0	195	97,5			

Tabla 4. Factores relacionados con la conducta médica. Policlínico Turcios Lima. Años 2022.

Table 5 shows the factors related to the clinical evolution, where the presence of established sequelae and developed complications constituted risk factors related to the appearance of post-COVID 19 syndrome more than 14 times the first (OR=14.08). (CI 7.63-25.97), (P< 0.001) and more than 12 times the second (OR=12.32), (CI 4.53-33.45), (P< 0.001), being highly significant.

	CASOS N=100		CONTROLES N=200		OR	IC	X2
Variables	No	%	No	%			
Complicaciones							
Si	24	24,0	5	5,0	12,32	4,53-33,45	35,29 (P<0,001)
No	76	76,0	195	97,5			
Secuelas							
Si	61	61,0	20	10,0	14,08	7,63-25,97	87,98 (P<0,001)
No	39	39,0	180	90,0			

Tabla 5. Factores relacionados con la evolución clínica. Policlínico Turcios Lima. Años 2022.

Discussion

In the literature reviewed, it is suggested that age ≥ 50 years was associated with a lower quality of life, persistence of symptoms and a lower frequency of olfactory dysfunction. Likewise, as age increased, an increase in the risk of deterioration in functional status measured using the post-COVID-19

functional status scale was observed. The presence of post-COVID 19 syndrome is greater in females (56.3%) compared to males (45.5%). The severity of the initial condition was statistically significantly associated with respiratory symptoms. Urban residence area and occupation (study or work) are proven risk factors related to acute COVID-19 infection, but there is no evidence that they are related to post-COVID 19 syndromes [1-3].

Apparently in this study they were the patients who coincidentally attended the most to the multidisciplinary consultation of convalescents with this disease in the health area.

In the present study, female sex constituted a risk factor related to the appearance of post-COVID 19 syndromes, which is in accordance with what was reported by several authors. 4-6

Risk factors for post-COVID-19 syndrome identified include comorbidities (asthma or chronic obstructive pulmonary disease (COPD), obesity, and increased body mass index). Diabetes mellitus, high blood pressure, cancer and immunosuppression are risk factors for severity and mortality in the acute phase of COVID-19; However, there is no evidence of its association with post-COVID-19 syndrome. The comorbidities associated with the disease must be put in relation to the prevalence of said pathologies in the population. High blood pressure, liver diseases, chronic kidney disease and immunosuppression have been recognized as important factors associated with poor disease progression. In the published series of hospitalized cases, the presence of comorbidities ranged between 23.2% and 51%. [4-6].

Having a previous diagnosis of psychiatric illness was significantly associated with persistence of depressive symptoms. Likewise, having 2 or more comorbidities were risk factors for the persistence of symptoms during post-covid follow-up. In this study, the presence of associated comorbidities: diabetes mellitus, bronchial asthma, COPD, ischemic heart disease, and HTN, constituted risk factors related to the appearance of post-COVID 19 syndromes, which is in accordance with what was reported by other authors. 7-9

As a general concept, it is accepted that all patients who suffer from COVID-19 infection, whether asymptomatic, mild, moderate, severe or critical, are potentially candidates for developing a post-COVID syndrome and more specifically a Long COVID, COVID-19. Persistent or Long-COVID. On the contrary, for the development of established complications and sequelae, those with acute cases of moderate, severe or critical COVID-19 that required hospitalization are considered possible risks. 7-9

Some phenotypes have been described and it is necessary to recognize them in the clinic for their early diagnosis and approach, in order to reduce the risk of morbidity, mortality or disability. The first is post-COVID19 tachycardic syndrome, in which palpitations occur in approximately 50% of patients. Another phenotype is the classification of the duration or appearance of symptoms, which can categorize acute (4-12 weeks) and subacute (> 12 weeks) patients. 7-9

Persistent symptoms after suffering from COVID-19 have been identified in a large majority of patients, and studies indicate a great variation in their frequency, ranging between 40 and 90%. The coexistence of more than 5 symptoms during the first 7 days after the onset of the clinical picture of COVID-19, increases the risk of developing a post-COVID syndrome 3.5 times. The 5 symptoms experienced in the first week of acute COVID-19 infection that had the greatest predictive value for the development of post-COVID-19 syndrome were: fatigue, headache, dyspnea, dysphonia and myalgia. 7-9

Fatigue is the most common symptom of post-COVID-19 syndrome. The approach to patients with fatigue is fundamentally clinical, so the use of paraclinical studies should be minimal, limited to ruling out other causes of fatigue. If the initial evaluation suggests a specific differential diagnosis, additional targeted testing will be warranted. A high index of suspicion for systemic exercise intolerance disease (ESIE) should be maintained when approaching a patient with chronic fatigue. 7-9

Post COVID Syndrome can give rise to more than 50 symptoms, which occur in multiple ways in most cases. This syndrome affects hospitalized patients and patients whose care was at home, that is, there is evidence that it can occur in both severe cases and mild cases (that required care and treatment without hospitalization); and it also affects young patients, not only elderly patients and those who did not have previous illnesses, not only patients with comorbidity. 7-9

Residual symptoms after SARS-CoV-2 infection are common among otherwise young and healthy people followed in an outpatient setting. Are

common in the course of persistent COVID-19, the intermittent presentation of the symptoms, the exacerbation of symptoms with physical or mental effort and the so-called "brain fog", which encompasses multiple symptoms associated with cognitive impairment such as memory loss, disorientation, interference with executive functions or problems with learning and concentration. [7-9].

The prevalence and incidence of Post COVID Syndrome varies according to reports published in the literature, being approximately 10%. Given the heterogeneity of the symptomatology sign and the variability of the evolution, this situation represents a challenge for the health team not only in identifying the problem of

health, but also in the development of diagnostic and therapeutic action protocols. 10-12

The etiopathogenesis of post-COVID-19 syndrome is probably multifactorial, given the wide spectrum of clinical manifestations. Post-COVID-19 syndrome is a complex and heterogeneous entity, in which there may be multiple factors that trigger specific post-convalescence syndromes. In the case of post-ICU syndrome, it has been related to ischemia due to involvement of small vessels, the effect of immobility, myopathy/neuropathy of the critically ill patient, and metabolic alterations associated with critical illness.

A characteristic of post-COVID-19 syndrome is the appearance of new symptoms that can fluctuate over time. Various hypotheses have been proposed to explain this fact: a) the presence of a defective immune response on the part of the host, which would favor viral replication for a longer time; b) the existence of systemic damage secondary to an excessive inflammatory response or an alteration of the immune system (cytokine storm syndrome); c) the presence of physical (physical deterioration) or mental/psychosocial consequences (anxiety, depression, post-traumatic stress disorder, effects of confinement or social isolation), and, more unlikely, d) reinfection by the same or a different variant of SARS-CoV-2. No virus particles have been detected that replicate beyond three weeks from the onset of symptoms. However, the virus could persist in immunological sanctuaries where the immune system would have difficulty eradicating it, leading to a latent or chronic infection, but so far there is no evidence to confirm this hypothesis. 10-12

In this study, neither the type of infection, nor the duration of symptoms, nor the severity of the initial clinical picture were related to the appearance of post-COVID 19 syndromes, which is in accordance with what was reported by some authors, who propose that post-COVID 19 syndromes can occur in any patient, regardless of the type of infection, the duration of symptoms, and the severity of SARS-CoV-2 infection. [10-12].

However, according to some authors, patients who required hospitalization are at greater risk of developing a post-COVID-19 syndrome. Even in cases of asymptomatic COVID-19 (diagnosed

Three types of clinical manifestations are described in these patients, which so far have different incidences as reported by the reviewed literature, which the health team must identify and control their post-COVID 19 clinical evolution until complete resolution: complications developed, sequelae established and residual or prolonged symptoms, which are symptoms that persist between three weeks from the onset of the first symptoms to 12 weeks and do not mean that the person is infectious.

In this study, the following complications and sequelae were identified in order of frequency. The main complications were: 45%, of which: respiratory sepsis (11%), mononeuropathy (10%), arterial hypertension (10%), respiratory failure (5%), stroke (4%), acute gastritis (2%), pulmonary thromboembolism (2%) and epicondylitis (1%). The main sequelae were: Neurological: 119, of them: insomnia (42%), headache (26%), dysgeusia (9%), peripheral neuropathy (8%), drowsiness (7%), memory loss, cognitive impairment and anosmia (5%), dysphonia, hearing loss and dizziness (3%), cervical stiffness, blurred vision, ringing in the ears, metallic taste and loss

of balance (2%). Respiratory: 80%, of which: dyspnea (32%), cough (27%), pneumonia (11%), pulmonary fibrosis (5%) and pulmonary functional impairment (5%). Osteomyoarticular system: 74%, of them: arthralgia (45%), lumbosacral pain (13%), lower limb pain (11%) and neck pain (5%). General: 69%, of which: hair loss (23%), anorexia (10%), weight loss (8%), sweating (5%), cramps and coryza (4%), vomiting, diarrhea and itching (3%), sore throat, frequency and expectoration (2%). Rheumatological: decline (60%). Cardiovascular: 45%, of which: chest pain (17%), palpitations (10%), tachycardia (8%), arrhythmias (8%) and peripheral venous thrombosis (2%). Mental health: 34%, of them: anxiety (16%), depression (13%) and post-traumatic stress (5%). Endocrine: deterioration of diabetic control (2%), among others.

In this study, the complications developed and the sequelae established constituted risk factors related to the appearance of post-COVID 19 syndromes, which is in relation to what has been described by other authors. [18-20].

More time and research are needed to understand the long-term effects of COVID-19, why symptoms persist or recur, how and who it affects, and the clinical course and likelihood of a full recovery. Likewise, know the previous pathology of these patients, and other risk factors that may affect the appearance of PostCOVID Syndrome. 18-20

It is concluded that despite identifying the most frequent risk factors related to post-COVID 19 syndrome, such as female sex, associated comorbidities, pharmacological treatment, ventilatory support, the presence of established sequelae and developed complications, they continue being a challenge for health professionals. It is recommended to carry out epidemiological studies on the risk factors of post-COVID 19 syndromes.

Conflict of interest

The authors declare that there are no conflicts of interest.

Approval by the Scientific Council

The scientific article titled: Risk factors related to post-COVID 19 syndrome was approved for publication. Turcios Lima Polyclinic, authored by: Dr. Jorge Félix Rodríguez Ramos and co-authors.

Author contributions

Dr. Jorge Félix Rodríguez Ramos: Conceptualization, project administration, research, supervision, data curation, formal analysis, writing and review of the original draft. Approval of the final version of the manuscript.

Dr. Juan Cordero Martínez, Lic. Greter Cordero dela Nuez: Research, writing and review of the original draft. Approval of the final version of the manuscript.

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