



## A Case Report on the Physiotherapy Management of a Person Suffering from Post-Covid Syndrome in a Private Tertiary Care Hospital

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### Abstract

The exponential growth of coronavirus disease caused by SARS-CoV-2 infections has contributed in a public health crisis. A large number of COVID-19 patients require intensive care for an extended period of time. Post-covid syndrome has become a growing health concern. Patients described a wide range of persistent and new symptoms, including chronic pain, cough, shortness of breath, and chest discomfort, tenseness, as well as extreme exhaustion. Physiotherapists play a significant role in rehabilitation. Multidisciplinary treatment improves the patient's lung and functional capacity significantly. We present a case of a 50-year-old male with covid 19 who developed post-covid syndrome, demonstrating the role of pulmonary rehabilitation and outlining the recovery pathway to discharge.

Conclusion: Physiotherapy management involving prone positioning, diaphragmatic breathing, aerobic training and strength training showed significant progression in terms of relieving dyspnea, improving exercise capacity and thus functional capacity.

**Keywords:** SARS – CoV-2, prone position, Diaphragmatic Breathing, Case Report, SF12

### INTRODUCTION

The coronavirus disease (COVID-19), caused by SARS –CoV-2 mainly affects the respiratory system, as interstitial pneumonia and acute respiratory distress syndrome (ARDS).<sup>1</sup>

Globally, as of now, there have been 132,046,206 (April 2021) confirmed cases of COVID 19, including 2,867,242 deaths, reported to WHO. In India, there have been 12,801,785 confirmed cases of COVID 19 with 166,177 deaths.

Frequent symptoms of the disease are, fever (89%), cough (68%), fatigue (38%), sputum production (34%), and shortness of breath (19%), but muscle soreness, anorexia, chest tightness, dyspnea, nausea, vomiting, diarrhea, and headache also accompanied.<sup>2</sup>

In post-acute COVID-19 given guideline:(1) COVID-19 symptomatic for a long time for those who are already experiencing symptoms a duration of 4 to 12 weeks when acute symptoms first appear; and(2) COVID-19 post-syndrome people who are also suffering from symptoms of after a period of more than 12 weeks from the start of acute signs and symptoms.<sup>3</sup>

Post covid syndrome include pulmonary, gastrointestinal, and vascular fibrosis, as well as chronic immunosuppression. Organ and vasculature pathologic fibrosis causes increased mortality and a significantly worsened quality of life.<sup>4</sup>Chronic pain, cough, shortness of breath, chest pressure, chest tightness, and severe fatigue are all signs of post-covid

syndrome.<sup>5</sup>Hence, a multidisciplinary approach for evaluation and follow-up becomes important.

**Case description:** This is a report presenting physiotherapy management to improve patient's lung capacity and quality of life.

A50-year-old male patient came to the emergency department 1 month back, presented with breathlessness, cough and fever having no prior comorbidities. His RTPCR for COVID 19 came out to be positive. In the HRCT, fibroblastic changes in bilateral lung parenchyma, more extensive in right upper and right lower lobes were revealed. Dyspnea and headaches were chronic symptoms for the patient. A physiotherapist's assessment on the 30th day showed deficiencies in exercise capacity and muscle strength. There was also a substantial increase in perceived exertion rate and decrease in 6MWT expected distance. He was in ICU for 4 weeks and was discharged after the test report came to be negative in down care unit. When patient was in down care unit, he was referred for physiotherapy.

**Examination:** Patient belonged to overweight category. His BMI was 29. On his initial assessment (30<sup>th</sup> day), patient had difficulty in performing leisure activities. Breathlessness with minimal exertion was the primary complaint. He reported generalized malaise. Auscultation of the lungs revealed diminished

bilateral vesicular breath sounds indicating diminished air entry. His blood oxygen saturation was (89% [SpO<sub>2</sub>]), heart rate was (120 beats per minute), and respiratory rate was (22 breaths per minute). His chest expansion was reduced at all three levels. Different tests were performed by patient and the scores are provided in the table. Patient had minor muscle weakness measured by handheld dynamometry.

**Rehabilitation:**

Rehabilitation program was for 6 days/week for 2weeks (12 sessions). Rehabilitation included patient education, aerobic training, strength training, and breathing techniques. The total duration for 1 session was 40 minutes which included warmup, breathing exercises-diaphragmatic breathing 5-7times, cycle ergometer, strength training by clay activities. Between each activity 2 minutes of pacing was given and when patient felt breathless he started with pursed lip breathing. During the day, patient switched position every 2 hourly, and was told to sleep in a prone position at night, if tolerated. On the basis of six min walk test, aerobic training duration and intensities were established. The patient's initial level for aerobic training was determined Karvonen method.

Aerobic intensities were progressively increased to maintain workload based on modified Borg scale.



a. Cycle ergometer

b. Prone position

**Physiotherapy management and Outcome measure:**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Modified Borg scale(RPE)</li> <li>2. SF12</li> <li>3. PEFR</li> </ol> | <ol style="list-style-type: none"> <li>4. FIM</li> <li>5. 6MWT</li> <li>6. HAND HELD DYNAMOMETER</li> <li>7. POST COVID FUNCTIONAL SCALE</li> </ol> |
|---|---|

**Table 1. Physiotherapy management and outcome measures with post treatment results.**

Sr.no	Intervention and outcome measure	Pretreatment	Post treatment	
			1 week	2 week
1.	Diaphragmatic breathing	×	√ (3 times/day)	√ (3 times/day)
2.	Prone position	×	√ (3 times/day)	√ (3 times/day)
3.	RPE	5	3	1
4.	Spo <sub>2</sub>	89% (at room air)	92% (at room air)	98% (at room air)
5.	PEFR	290 L/min	300 L/min	380 L/min
6.	FIM	103	105	110
7.	SF12	Physical- 29.49 Mental- 35.43	Physical- 40.89 Mental- 54.20	Physical-55.50 Mental- 57.82
8.	6 MWT (m)	188 m	220 m	340 m
9.	Grip strength (kg) Right Left	34.4 30.2	37.5 32.6	42.3 36.5
10.	Post Covid functional scale	Grade 3	Grade 1	Grade 1

**Discussion:**

In one article, it was concluded that patient’s prone posture can be used as an adjunct therapy to improve ventilation. Patients who stay in the vulnerable prone position for long periods of time have a lower mortality rate.<sup>6</sup>

According to a previous study, diaphragmatic breathing relaxation tends to be effective at lowering anxiety levels.<sup>7</sup>

Controlled breathing strategies that emphasize diaphragmatic breathing are intended to increase ventilation effectiveness, reduce work of breathing, increase diaphragm excursion, and enhance oxygenation.<sup>8</sup>

Therefore, in our patient with post covid syndrome, diaphragmatic breathing and prone positioning is effective to relieve dyspnea and improve quality of life.

For patients with serious pulmonary dysfunction, oxygen therapy is an important therapeutic option. However, since our exercise protocol included activity pacing and pursed lip breathing when the patient experienced dyspnea, our patient did not need supplementary oxygen.<sup>9</sup>

In one study, it was concluded that cycle ergometer training is especially beneficial for older adults over the age of 50 because it improves cardiorespiratory fitness, blood pressure levels, and endurance parameters. It improves functional status by increasing

muscle strength and, to a lesser degree, improving physical fitness.<sup>10</sup>

**Consent:**

Informed consent taken from the patient before the start case report writing.

**Conclusion:**

Physiotherapy management for two weeks involving prone positioning, diaphragmatic breathing, aerobic training and strength training showed significant progression in terms of relieving dyspnea, improving exercise capacity and thus functional capacity.

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**References:**

1. Landi F, Barillaro C, Bellieni A, Brandi V, Carfi A, D'Angelo M, Fusco D, Landi G, Monaco RL, Martone AM, Marzetti E. The new challenge of geriatrics: saving frail older people from the SARS-COV-2 pandemic infection. *The journal of nutrition, health & aging.* 2020 May;24(5):466-70.
2. Alhazzani W, Møller MH, Arabi YM, Loeb M, Gong MN, Fan E. & Du, B.(2020). Surviving Sepsis Campaign: guidelines on the management of critically ill adults with Coronavirus Disease 2019 (COVID-19). *Intensive care medicine.*:1-34.

3. Venkatesan P. NICE guideline on long COVID. *The Lancet Respiratory Medicine.* 2021 Feb 1;9(2):129.
4. Oronsky B, Larson C, Hammond TC, Oronsky A, Kesari S, Lybeck M, Reid TR. A Review of Persistent Post-COVID Syndrome (PPCS). *Clinical reviews in allergy & immunology.* 2021 Feb 20:1-9.
5. Venkatesan P. NICE guideline on long COVID. *The Lancet Respiratory Medicine.* 2021 Feb 1;9(2):129.
6. Ghelichkhani P, Esmaeili M. Prone position in management of COVID-19 patients; a commentary. *Archives of academic emergency medicine.* 2020;8(1).
7. Chen YF, Huang XY, Chien CH, Cheng JF. The effectiveness of diaphragmatic breathing relaxation training for reducing anxiety. *Perspectives in psychiatric care.* 2017 Oct;53(4):329-36.
8. Karam M, Kaur BP, Baptist AP. A modified breathing exercise program for asthma is easy to perform and effective. *Journal of Asthma.* 2017 Feb 7;54(2):217-22.
9. Righetti RF, Onoue MA, Politi FV, Teixeira DT, Souza PN, Kondo CS, Moderno EV, Moraes IG, Maida AL, Pastore Junior L, Silva FD. Physiotherapy care of patients with coronavirus disease 2019 (covid-19)-a Brazilian experience. *Clinics.* 2020;75.
10. Bouaziz W, Schmitt E, Kaltenbach G, Geny B, Vogel T. Health benefits of cycle ergometer training for older adults over 70: a review. *European Review of Aging and Physical Activity.* 2015 Dec;12(1):1-3.