PHYSIOTHERAPY REHABILITATION IN LONG COVID: A CASE SERIES

Physiotherapy

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ABSTRACT

SARS-CoV-2 also known COVID 19, has been observed to cause long term functional impairments. There have been reports of post covid discharge symptoms such as dyspnoea, fatigue, and reduced overall capacity. Physiotherapy is an integral component of pulmonary rehabilitation. It plays a key role in improving functional status and quality of life in patients with chronic respiratory diseases. COVID 19 being a multisystem disease with primary affection of the lung can be benefitted with physiotherapy intervention. We present a case series of four patients with complaints of dyspnoea and fatigue post covid, enrolled for face to face pulmonary rehabilitation at our tertiary care centre.

KEYWORDS

Post Covid, Long covid, pulmonary rehabilitation, Respiratory exercises

INTRODUCTION:

Long Covid refers to cases of Covid 19 not recovering for several weeks or months following the start of symptoms that were suggestive of Covid.¹ Patients following Covid 19 have been observed with persistence of symptoms with many being referred with a risk of long-term impairment and disability.² Fatigue, breathlessness, psychological distress, reduced aerobic capacity are most common symptoms reported as persisting for longer periods of time.³ Western guidelines have recommended pulmonary rehabilitation as an effective non pharmacological treatment strategy for people recovering from Covid 19.² We present a series of four Post covid fibrosis cases referred to physiotherapy department for pulmonary rehabilitation post discharge.

This case series highlights the safety and feasibility of face to face physiotherapy as a component of pulmonary rehabilitation following screening of cardiac status pre enrolment. Informed consent was taken from the patients to present their vital information and details. Precautions for infection control were applied by the treating therapist during rehabilitation sessions.⁴ Feasible outcome measures were used to prescribe intensity and measure improvement of function and quality of life.

Case 1:

A 57 year old female with childhood Bronchial asthma, and hypertension was admitted in Covid ICU. She needed Non Invasive ventilation (NIV) as oxygen support. On admission, her investigations showed a raised Lactate dehydrogenase (LDH=877.9 IU/Lit), C-reactive protein (CRP=10.14 Mg/Lit), Creatine phosphokinase (CPK=161.8 IU/ Lit). The lung CT scan (HRCT) showed fibrotic changes with lung involvement of < 30 %. Her hospital stay was of 47 days and she was discharged at room air. One month post discharge she was referred for rehabilitation with complaints of dyspnoea (Grade 2 MMRC) and fatigue and overall weakness, cough with mucoid expectoration.

Case 2:

A 50 year old male with Diabetes mellitus was treated with NIV and discharged on room air after a hospital stay of 33 days in Covid ICU and step down unit. During admission, his D Dimer was > 0.5 < 1.0 IU/Lit, CRP was 13.25 mg/Lit, LDH was 1035.4 IU/Lit, and Interleukin 6 was 82.1 pg/ml. His HRCT showed bilateral ground glass opacities suggestive of atypical pneumonia (CORADS- 6). He was referred for physiotherapy 20 days post discharge with complaints of fatigue and dyspnoea on exertion (Grade 2 MMRC).

Case 3:

A 58 year old male, with diabetes mellitus and hypertension, was managed with face mask 3 L O₂ and discharged on room air after a hospital stay of 13 days in covid step down unit. During admission, LDH was 711.8 IU/Lit, CRP was 31.75 Mg/Lit. He was referred for

physiotherapy 45 days post discharge with complaints of dyspnoea (Grade 1 MMRC) and weakness.

Case 4:

A 34 year old male, with no comorbidities, managed with face mask at 4 L O₂/min and was discharged on room air after 9 days. On admission, he showed elevated liver enzymes (aspartate transaminase and alanine transaminase), blood haemoglobin was 8.8 gm/dL, and CRP was 30.8 mg/dl. The lung CT scan shows sub pleural ground glass densities suggestive of atypical pneumonia (CORADS- 4). He was referred for physiotherapy 1 month post discharge with complaints of dyspnoea (Grade 2 MMRC) and fatigue.

DISCUSSION:

In India, along with improved rates of discharge from Covid 19 touching 90.2%,⁵ there has been increased number of post covid patients coming back to healthcare with long term functional impairments. The prevalence of post-COVID-19 fibrosis is apparent with time, but early analysis of COVID 19 patients post discharge suggests that more than a third of recovered patients develop fibrotic abnormalities.⁶

These patients were diagnosed as post covid sequelae and referred almost a month after discharge. They had common complaints of dyspnoea, fatigue and general weakness with inability to carry out work. 3 out of 4 patients had associated comorbidities. The hospital stay ranged from 9 to 47 days. LDH, CRP and D Dimer levels during the hospital stay were observed to be elevated in 3 patients. HRCT findings suggested post covid fibrotic changes in the lungs.

An individualized exercise program which included patient education, energy conservation during daily physical activity, stress relieving counselling, breathing strategies recruiting diaphragm to improve ventilation, use of assistive device (incentive spirometer) during the initial week. A structured aerobic exercise program which included walking progression and low level resistance training for muscle performance improvement was initiated and progressed gradually based on Rate of perceived exertion, maintaining intensity at 3-4 (moderate effort).

All Patients were comfortable with the use of ground level walking and stationary cycling started initially for 10 minutes and progressing till 15- 20 minutes towards the end. Fatigue score of <3 (Moderate) was maintained throughout the regime, on the Borgs 0-10 scale. Exercises on stepper could be introduced for 2 minutes followed by 1 minute marching with work rest ratio of 2: 1, for case 2 & 3 only. Resistance training for upper and lower extremity with 0.5 to 1 kg weight cuffs could be given after the third session as a single set of 10 repetitions which was progressed to 3 kg for upper limb in case 2 and 3. Functional training exercises like partial squats, lunges and lunge walking were also introduced. Relaxation with autosuggestions for relieving psychological distress was added as per patient's need.

Each session was for minimum 20 minutes progressing to 30-45 minutes with rest periods incorporated as and when required. Patients were continuously monitored for heart rate, saturation and symptoms of fatigue and dyspnoea during supervision and for any other new symptom. They were also trained for monitoring of dyspnoea, fatigue and saturation at home. All interventions were delivered using both supervised (twice/week).

To ensure adherence to home program, a patient information pamphlet and a compliance sheet for recording the exercise parameters were provided. A WhatsApp group of therapists with all patients served as an easy means of communication regarding any difficulty faced by patients during home program.

Outcome measures to assess improvement in function were chosen considering feasibility and infection prevention. Single breath count a measure of pulmonary function⁷ showed improvement by 5-9 counts. The 30 sec sit to stand as a measure of lower extremity performance was used. A repetition of less than 8 indicates impairment of activities of daily living. These patients reached a count of 8 which was just adequate and improved by 2 counts more. 6 minute walk distance (6MWD) showed improvement from 60 to 184 meters, which is comparable to minimal clinical improvement of 25 to 35 m in chronic lung disease.⁹ The COV19-impact on QoL scale v1.5 which explores the feelings and thoughts of the patient during past seven days to understand the impact of COVID-19¹⁰ on quality of life was used. A higher score indicated a greater impact on quality of life. A pre post difference in all patients showed a reduction of score by 6 -9 digits. (Table 2)

Table 2: Changes in outcome measures pre and post rehabilitation

Variables	Case 1	Case 2	Case 3	Case 4
SBC Pre	16	25	20	10
SBC Post	24	30	26	19
30 sec STS Pre	8	11	9	9
30 sec STS Post	10	13	10	10
6MWD Pre	280	368	348	432
6MWD Post	384	552	468	492
QOL Pre	18/30	16/30	17/30	19/30
QOL Post	12/30	8/30	8/30	12/30
Exs Prog(weeks)	6	6	4	4

SBC- Single Breath count, 30 sec STS- 30 second sit to stand, 6MWD- 6 minute walk distance, QOL- Quality of Life, exs prog-exercise program.

Perception of patients at the end of the comprehensive rehabilitation program was marked improvement in their ability to carry out work and overall general well-being. The fear and uncertainty regarding how to manage their lifestyle during recovery from Covid 19 was alleviated at the end of 4 weeks. They had minimal (grade 1 MMRC dyspnoea for case 1 and 4) to no symptoms of dyspnoea and fatigue with which they had presented, towards the end of 4 weeks.

The ability to recover to pre covid levels appears to be marked with intervention in the form of peripheral conditioning and breathing exercise. A period of 4 weeks with two supervised sessions seemed to benefit these patients. As it is difficult to have more face to face sessions addition of telerehabilitation where possible could have benefit additionally.

CONCLUSION:

Post covid sequelae or Long covid hampers individual capacity to resume to pre covid functional status. There may be number of factors that may be associated with it. Where the complete scenario is still uncertain with changing trends, the present case series shows physiotherapy along with medical management does prove beneficial in improving functional capacity, ability to carry out daily chores and participation in society.

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