

Efficacy of Multidisciplinary Approach for Rehabilitation in Subjects with Post COVID Syndrome- A Case Series

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Abstract

Covid-19 pandemic was the biggest problem the whole world faced in recent times. Post Covid-19 patient still experiences various issues like fatigue, breathlessness and reduced endurance. International bodies have now suggested that the pulmonary rehabilitation setting is an appropriate pathway for patients recovering from Covid-19 with respiratory or non-respiratory symptoms. A proper rehabilitation protocol should be followed to get maximum result. This case series focuses on the multidisciplinary rehabilitation in post COVID-19 patients. The patients who have tested negative for COVID but having post COVID syndrome were asked to go for pulmonary rehabilitation. The patients were assessed according to the symptoms and a treatment plan was made. Patients were asked to visit the rehabilitation centre 5 days a week for 4- 6 weeks. The rehabilitation protocol included patient education, endurance training, strength training, balance training, stretching and relaxation techniques and ergonomic advice for the patient. The protocol started with warm up exercises followed by the prescribed exercises and then cool down exercises. In this pandemic the main focus has always been acute care but people are facing long term effects as well so proper treatment protocol must be followed and post COVID rehabilitation should be given more importance. As there is a significant effect of post COVID rehabilitation on relieving the post COVID symptoms.

1. Introduction

According to World health Organisation 17Cr people were tested positive for COVID-19 worldwide of which 2.9Cr people are from India [1]. India being 2nd most populated country was facing problems to maintain social distancing because of which COVID-19 is spreading more rapidly and larger population is getting affected. Larger the population affected more was the spread of the disease. Covid-19 infection affects mainly respiratory system but other systems were affected as well. Post Covid-19 patient still experiences various issues like fatigue, breathlessness and reduced endurance[2]. 1 after every 4 patients is facing post COVID syndrome. Post COVID syndrome patients either experience shortness of breath, anosmia, ageusia or fatigue as long-lasting symptoms[3].

International bodies have now suggested that the pulmonary rehabilitation setting is an appropriate pathway for patients recovering from Covid-19 with respiratory or non-respiratory symptoms[4]. In Post Covid patients both strength that is the quality to remain strong and endurance which is the ability to remain active for long time is affected because of which they struggle in daily activities and back to working life become difficult. Endurance training focus on the aerobic system of the body whereas strength training targets anaerobic system, strength training is also known as resistance training which is a form of fitness training which uses external weights or own body weight to target some specific muscle to improve their strength. Post COVID- 19 rehabilitation focuses on increasing the lung capacity, increasing lung recoil and strength of muscles[5]. Depending on complains and the assessment protocol was prepared.

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Intensity Frequency and repetitions were decided based on the physical condition at the time of assessment[6]. A proper rehabilitation protocol should be followed to get maximum result. This case series focuses on the physiotherapy rehabilitation in post covid patients and effect of the same.

2. Methodology

The patients who have tested negative for COVID but having post COVID syndrome were asked to go for pulmonary rehabilitation. Initial rehabilitation assessment was done which included- Temperature, Blood Pressure, Pulse, respiratory rate assessment and 6min walk test[7]. Apart from general assessment fatigue severity score, anxiety depression score and quality of life was also assessed using FSS [6], DASS21 and SF-36 respectively. Physical impairments which can be treated by pulmonary rehabilitation were considered. 4 to 6 weeks program was designed for each patient and reassessment was done post 6 weeks.

Prior to the treatment in each session oxygen saturation, pulse was checked and in between the session as well. Monitoring the parameters was considered important. This monitoring was considered important to mitigate adverse events and to gauge physiological response to exercise. An oxygen desaturation of $\geq 3\%$ was determined as the point to stop exercise and request a medical review. The rehabilitation programme prescribed for each patient was individualized to target identified treatable traits. The management strategies included breathless management techniques, breathing exercises, and energy conservation. The exercise prescription of intensity, duration, frequency, type, and mode aimed to return the patients to their pre-morbid fitness levels [8]. The patients performed all the exercises 5 days per week for 45 mins.

Initially the mode of aerobic training was cycling considering the breathlessness and fatigue score, low intensity or moderate intensity cycling was given. Estimated Maximum heart rate was calculated considering the baseline heart rate and the treatment was planned accordingly.

3. Result:

Patients and description- The patients 2 were male one

was female aged 45-80 years. A Case by case scenario is described below

Scenario 1- A 48 year old female came to the OPD post COVID-19 with complain of breathlessness on walking with her normal pace. Patient tested negative for COVID-19 7 days back when she visited the OPD. On Assessment the patient was Afebrile, oxygen saturation was 97% her heart rate was 82beats per minute and Respiratory rate was 24breaths per minute. MMRC score was 2, 6 min walk test was performed and the distance covered was 320m with 2% drop in oxygen saturation and heart rate was raised till 94 beats per minute. Fatigue severity score was 1, Dass21 scoring showed mild depression, normal anxiety level and mild stress. Estimated maximum heart rate was 138 beats per minute.

Exercise protocol started with warm up, followed by exercises and then cool down. For warm up range of motion exercises were given for shoulder, elbow and wrist in upper limb and for hip, knee and ankle in lower limb. Breathing exercises were given after warm up which included segmental expansion exercises, diaphragmatic breathing and thoracic expansion exercises. Cycling was given for 5 min initially and progressed till 20 min. Post cycling a break was given for 2 minutes at that time patient was asked to perform pursed lip breathing for 7 times. Strength training was given with 0.5kg dumbbell for upper limb muscles and 1 kg weight cuff of lower limb strength training. Relaxation techniques were taught to the patient and dyspnoea relieving positions were showed and asked to perform in front of the therapist first. Cool down session included pursed lip breathing, stretching for both upper and lower limb muscles. All the exercises were progressed in the span of 6 weeks.

Post 6 weeks assessment was performed which showed oxygen saturation was 99%, heart rate was 78 beats per minute, and respiratory rate was 18 breaths per minute MMRC score was 0, 6 minute walk distance was 530m with 1% drop in oxygen saturation and heart rate was 82 beats per minute, Fatigue severity scale was 0, Dass 21 scoring was normal level of depression, normal anxiety level and mild stress.

Scenario 2- A 54 year Male came to Post COVID-19 rehabilitation centre with complain of breathlessness

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while climbing stairs. Patient tested negative for COVID-19 10 days back when he came to OPD. On Assessment the patient was afebrile, oxygen saturation was 98% his heart rate was 78 beats per minute Respiratory rate was 20 breaths per minute, MMRC score was 1, 6 minute walk distance was 450m with 1% drop in oxygen saturation and heart rate was 85 beats per minute. Fatigue severity score was 1, Dass21 scoring showed normal depression level, anxiety level and stress levels. Estimated maximum heart rate was calculated

Exercise protocol started with warm up, followed by exercises and then cool down. For warm up range of motion exercises were given for shoulder, elbow and wrist in upper limb and for hip, knee and ankle in lower limb. Breathing exercises were given after warm up which included segmental expansion exercises, diaphragmatic breathing and thoracic expansion exercises. Cycling was given for 10 min initially and progressed till 20 min. Post cycling a break was given for 2 minutes at that time patient was asked to perform pursed lip breathing for 7 times. Strength training was given with 1 kg dumbbell for upper limb muscles and 1 kg weight cuff of lower limb strength training. Relaxation techniques were taught to the patient and dyspnoea relieving positions were showed and asked to perform in front of the therapist first. Cool down session included pursed lip breathing, stretching for both upper and lower limb muscles. All the exercises were progressed in the span of 6 weeks.

Post 6 weeks assessment was performed which showed oxygen saturation was 100%, heart rate was 74 beats per minute, and respiratory rate was 16 breaths per minute MMRC score was 0, 6 minute walk distance was 580m with 0% drop in oxygen saturation and heart rate was 79 beats per minute, Fatigue severity scale was 0, Dass 21 scoring was normal level of depression, normal anxiety level and normal stress.

Scenario3 - A 63 year Male came to Post COVID-19 rehabilitation center with complain of breathlessness and chest pain. Patient tested negative for COVID-19 6 days back when he came to OPD. On Assessment the patient was afebrile, oxygen saturation was 95% his heart rate was 88 beats per minute Respiratory rate was 26 breaths per minute, MMRC score was 3, 6 minute walk distance was 280m with 2% drop in

oxygen saturation and heart rate was 95 beats per minute. Fatigue severity score was 3, Dass21 scoring showed moderate depression level, mild anxiety level and moderate stress levels. Estimated maximum heart rate was calculated

Exercise protocol started with warm up, followed by exercises and then cool down. For warm up range of motion exercises were given for shoulder, elbow and wrist in upper limb and for hip, knee and ankle in lower limb. Breathing exercises were given after warm up which included segmental expansion exercises, diaphragmatic breathing and thoracic expansion exercises. For aerobic training walking was given, brisk walking was given initially as per tolerated progressed to 20 minutes. Post walking a break was given for 2 minutes at that time patient was asked to perform pursed lip breathing for 7 times. Volume spirometer was given to the patient in order to improve the lung capacity. Relaxation techniques were taught to the patient and dyspnoea relieving positions were showed and asked to perform in front of the therapist first. Cool down session included pursed lip breathing. All the exercises were progressed in the span of 6 weeks.

Post 6 weeks assessment was performed which showed oxygen saturation was 99%, heart rate was 82 beats per minute, and respiratory rate was 16 breaths per minute MMRC score was 0, 6 minute walk distance was 420 m with 1% drop in oxygen saturation and heart rate was 85 beats per minute, Fatigue severity scale was 1, Dass 21 scoring was mild level of depression, normal anxiety level and normal stress.

4. Discussion

Acute patient management was the main focus since the COVID-19 outbreak but a shift was needed in the direction of the longer term management considering the post COVID syndrome. In this case series, we have discussed our post COVID-19 rehabilitation management of our first three patients. The programme delivered by Pulmonary Rehabilitation physiotherapist was feasible for the patients. Early support and challenges to the patients suffering from post COVID-19. When planning a rehabilitation protocol, comorbidities and the baseline heart rate and other baseline values should be considered of great importance. Pulse oxymeter was a very important

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aspect of rehabilitation. Monitoring the vitals was done pre-treatment and post treatment and in between. All the three patient had mild symptoms and very less hospital stay and no ICU stay. Treatment protocol will vary for patients recovering from COVID-19 but had an ICU stay[9]. A recent guideline provides expert consensus around rehabilitation, including a suggested core set of outcomes for people recovering from COVID-19 and this should be referred to when planning future COVID-19 rehabilitation programmes + pulmonary rehabilitation. Tele-rehabilitation also have shown good result in relieving the post COVID symptoms. So, for patient who are not comfortable in visiting the rehabilitation considering the risk of reinfection tele-rehabilitation can be a choice of treatment but for monitoring the patient should be aware about the oxygen saturation probe and monitoring of vitals while exercising[10].

5. Conclusion:

Pulmonary rehabilitation had a significant effect on relieving post COVID symptoms but a protocol of at least 6 weeks should be followed to get maximum result. While rehabilitation a good monitoring is required and if any adverse effects seen, treatment should be discontinued. While going for strength training delayed onset of muscle soreness should be considered and treatment should be planned accordingly. Understanding the exact symptoms patient is experiencing should be identified and treatment should be given accordingly.

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