AN OBSERVATIONAL STUDY ON ENDURANCE OF POST COVID-19 PATIENTS

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ABSTRACT

PURPOSE: This study was aimed to evaluate the endurance capacity on post COVID patient and evaluate the oxygen saturation in post COVID patient.

METHODS: 60 subjects based on inclusion and exclusion criteria, study setting: the individual of SCPT, Materials: Pulse oximetry, Stopwatch, Cones. Study design: Observational study, Sampling method: convenient sampling. Outcome measures: Six minute walk test (6MWT) and SpO2 (Oxygen saturation). In procedureCOVID-19 patients will be selected using convenient sample technique based on the inclusion and exclusion criteria after the collected data was tabulated and analyzed using descriptive & inferential statistics

CONCLUSION: Therefore, it was concluded that the 6-minute walk test was effective in post COVID-19 patient and shows increase in endurance capacity and oxygen saturation level.

Keywords: Oxygen saturation, Endurance capacity, SpO2, Six minute walk test, Post COVID patient.

INTRODUCTION

On December 31, 2019, Wuhan Municipal Health Committee reported 27 cases of unexplained pneumonia. After study by Chinese health experts, the pathogen of unexplained pneumonia was identified as a novel coronavirus on January 9, 2020, now known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Subsequently, SARS-CoV-2 began an epidemic in China, and more than 80,000 Chinese residents were infected with SARS-CoV-2. On February 11, 2020, World Health Organization (WHO) officially named the pneumonia caused by SARS-CoV-2 as Corona Virus Disease 2019 (COVID-19). Subsequently, on March 11, WHO identified the COVID-19 outbreak characteristically as a pandemic. In the next 5 months, COVID-19 began to spread around the world, more than 20 million people infected with COVID-19 and more than 700,000 deaths worldwide by August 12, 2020, and over 210 countries and territories are involved.

SARS-CoV-2 is one of the corona viruses. Corona virus is a positive single-stranded RNA virus with a diameter of 80 to 120 nm, which can be divided into 4 genera, namely α, β, δ, and γ. The SARS-CoV-2 is β-corona virus, and it is the seventh corona virus has found that can infect human. Current studies have found that people susceptible to SARS-COV-2 include of all ages, and the main source of infection are confirmed COVID-19 patients, and those in the incubation period and asymptomatic infected persons. SARS-CoV-2 has 4 main ways of transmission. First is droplet transmission, general people caused by inhalation droplets that is emitted by infected person when are coughing or talking. Second is transmission by close contact, that is contact with the mucous membrane or damaged skin of the COVID-19 patient or the virus carrier person, or contact with the droplets of the infected person who left on the surface of the object; the third is aerosol transmission, that is inhaling aerosol formed of droplets which emitted by infected people; the fourth is other possible means of transmission, including fecal-oral transmission etc. The main initial symptoms of COVID-19 patients include fever, dry cough, fatigue, and few people accompanied with pharyngeal pain, muscle soreness, nasal congestion, and runny nose, etc. The early clinical symptoms of COVID-19 are similar to common influenza and without specificity.

Most people with COVID-19 experience are mild to moderate illness, but around 15% progress to severe pneumonia, and about 5% of patient’s progress to acute respiratory distress syndrome. Studies have shown that among the many critical
patients with COVID-19, the proportion of the elderly is higher, which is closely related to the relatively low immunity of the elderly.\textsuperscript{5, 6}

The 6-minute walk test (6MWT) was established as a clinical test to look for Cardio-Pulmonary exercise tolerance, is now commonly being used as a screening tool for patients with COVID19 who don’t have Hypoxia (low Oxygen Saturation (<94\%) at rest, or those at a high risk. Six minute walk test will be used to determine the cardiac endurance of the patient.\textsuperscript{9}

The six minute walk test is a sub maximal exercise test that measurement of distance walked over a span of six minute.\textsuperscript{7} Before the six minute walk test patient’s vitals will be checked and marked the value with the help of pulse oximetry sometimes called the fifth vital sign is a non invasive method of measuring hemoglobin saturation spo2 by using a light signal transmitted through tissues. Pulse oximetry is the device used to measure the oxygen saturation.\textsuperscript{8, 9}

**BACKGROUND**

Athletes have always been the center of attention for the application of various training regimes. Little research has been done on the response of Post COVID patients to the various training programs. The effects of Low intensity programs have been analyzed earlier for Post pneumonia patients. But COVID patients have not been chosen very often. However, Various Pulmonary Rehabilitation patients have been subjected various training sessions abroad. The same or similar training sessions can be adopted for Post COVID Patients. The need for an additional training regime for Post COVID Patients has risen after the emergence of this COVID Pandemic. The need for a training regime has given rise to the need of this study. This study includes and compares the results of pre and post test of the Post COVID patients. The sudden rise in number cases leading to it’s announce as a Global Pandemic has also thrown light on this new Variety of Corona virus disease. Six minute walk test has been a very reliable outcome measure, its effect has been documented for various diseases. COVID 19 being a new variety of disease, can also be experimented with this test.

**METHODS**

**Study design:** Observational study.

**Study setting:** The individual of Saveetha College of Physiotherapy, Saveetha University. **Sampling method:** Convenient sampling.

**Sample size:** 30 subjects.

**Inclusion criteria**
- Post COVID patients (in saveetha follow up clinic),
- Willing to participate,
- Both male and female,
- Above 30 -50 age.

**Exclusion criteria**
- Recent injury, CVA (cardio vascular accident),
- Severely affected COVID patient,
- Any other co morbidities,

**Material Required:** Pulse-oximetry, Stopwatch, Cones.

**Outcome Measure:** Six minute walk test (6MWT) and SpO2 (Oxygen saturation).

**Data Collection Procedure**

Total of 30 post COVID-19 patients will be selected using convenient sample technique based on the inclusion and exclusion criteria after which detailed study procedure will be explained to the patients and written informed consent will be obtained from the patients or attenders.

**PROCEDURE**

Participants were selected based on the inclusion and exclusion criteria. Informed consent is obtained after explaining the procedure to the participant. Selected participants were assessed using the pulse oximetry, to determine the oxygen saturation after taking the saturation levels of the participants. Before conducting the test, Make the person relax and explain about the six minute walk test. After the test the values were noted again, the oxygen saturation values were taken and six minute walk test is used to determine the endurance of the patient. The values will be compared on both pre and post observation.

**RESULTS**

The collected data was tabulated and analyzed using descriptive & inferential statistics. To all parameters mean and standard deviation (SD) was used. Paired t-test was used to analyse significant changes between pre and post-test measurements. P value <0.0001 was considered as statistically significant.
Table 1: Pre and Post-test value for 6-minute walk test

<table>
<thead>
<tr>
<th>6-minute walk test</th>
<th>MEAN</th>
<th>SD</th>
<th>t-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>PR</td>
<td>81.83</td>
<td>5.95</td>
<td>2.7195</td>
</tr>
<tr>
<td></td>
<td>SpO2</td>
<td>90.10</td>
<td>15.55</td>
<td></td>
</tr>
<tr>
<td>Post Test</td>
<td>PR</td>
<td>82.77</td>
<td>6.54</td>
<td>9.2542</td>
</tr>
<tr>
<td></td>
<td>SpO2</td>
<td>94.43</td>
<td>2.21</td>
<td></td>
</tr>
</tbody>
</table>

Graph 1: Comparison of Pre and Post-test value for 6-minute walk test

Thirty participants were included in the study. Thirty participants were randomly assigned to each Six-minute walk test. From statistical analysis made with the qualitative data, revealed statistically significant difference between pre and post. The post-test mean value of Pulse rate is 82.77 and pre test values of Pulse rate is 81.83 which shows that the Pulse rate score in post test were comparatively more than pre test with P value < 0.001.

The post-test mean value of SpO2 is 94.43 and pre test is 90.10, this shows that Oxygen saturation in post test were comparatively more than pre test with P value < 0.001.

CONCLUSION

From the result, it has been concluded that 6-minute walk test was effective in post COVID-19 patient and shows increase in endurance capacity and oxygen saturation level.

DISCUSSION

Six-Minute walk test have been used by investigators as a rehabilitation protocol for post COVID-19 patients for improving Pulse rate and Oxygen saturation. The results of the present study revealed that post test demonstrated a significant/slight increase in Pulse rate and Oxygen saturation, as measured by Pulse oximetry. The improvement in Pulse rate of patients is excellent after Six minute walk test. Although both Pulse Rate and Oxygen saturation reveal significant improvement, the issues of specificity of training and reports in the literature lead one to expect that Six-Minute walk test would demonstrate more functional benefits from the training program than other. This study shows that Six-Minute walk test program leads to a minor improved subjective and clinical outcome in post COVID-19 patients. This study suggests that this type of treatment is more effective than other program in the treatment of post COVID-19 patients. There is another study on influence of mask on cervical spine dysfunction during COVID-19 pandemic which states that mask reduces the endurance of cervical muscles.10

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ETHICAL CONSIDERATION

This single case study was approved by Research committee and Institutional Review board in the college University and study start-up at Saveetha Medical College. Great care will be taken to fully explain the study to the patient before fully inform consent is taken.
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CONFLICT OF INTEREST: There are no conflicts of interest to declare.

REFERENCE


