



Effect of Yoga Therapy among Covid – 19 Patients

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Corona Virus disease (or) Severe Acute Respiratory syndrome COV₂ (or) Covid 19, Pandemic threatens Patients, Societies and healthcare system around the world. The clinical course of the infection consists of three stages, of which the third alone needs Hospitalization, for severe hyperinflammatory syndrome including acute respiratory Failure. Role of Nitric oxide (No) during the SARS attack in 2004 is well demonstrated. Nitric oxide (No) reverses the Pulmonary hypertension, as it improves severe hypoxia and increases the survival rate. Yoga therapy which includes Prarayama and other techniques improves the No (Nitric Oxide) severalfolds, as a result lung function may get improved spontaneously.

Aims of the study: The purpose of the study is to determine whether yoga therapy is increasing the spo₂ level among the covid – 19 (corona) Patients.

Methods: Corona patients (Covid – 19) in the age group at 22 to 72 years (non O₂ dependent patients) admitted at Rajah Muthiah Medical College and Hospital have participated in this study. Totally, 36 patients were included in this study (14 patients excluded), of the 36 patients, 18 patients, who regularly practiced yoga (n-18), were considered as Experimental group. The remaining 18 patients have practiced once in a while (in active group), So they were considered as control group in this study. All patients were taught pranayama techniques like suryaBhedana, Brahmari and preformed Linga mudra, For a duration of 5 days. Pre and Post-test were done with SPO₂ (Pulse Oxymeter). The obtained data were analysed with paired Sample T test.

Result: In this study we found that

1. Experimental groups Showed T. Value of 13.756 and significant p –value of 0.001.
2. Control group (non –active participation, t value of 0.566 and p – value of 0.579 (non – Significant).

Conclusion: The present study shows that yoga therapy techniques is effective in treating covid – 19 (corona) patients. Further studies are needed with other yoga therapy techniques for larger population.

Keywords: Yoga therapy, Corona, Nitric oxide, Pranayama, SpO₂.

INTRODUCTION

Corona virus can be indentified as a group of enveloped viruses with non-segmented, Single stranded and positive sense RNA genomes. ⁽¹⁾Corona Virus disease (or) Severe Acute Respiratory syndrome COV₂ (or) Covid 19, Pandemic threatens Patients, Societies and healthcare system around the

world. The clinical course of the infection consists of three stages, of which the third alone needs Hospitalization, for severe hyper-inflammatory syndrome including acute respiratory Failure, while first and the second (or) moderate pulmonary

involvement might damage and needed monitoring within a home care Program during quarantine. ⁽²⁾

Morbidity and lethality have a direct link with the early vicious cycles triggered by an acute microcirculation and endotheliopathy a co-related coagulopathy up to late hypoxic damage of multi-organ tissue. ⁽³⁾

The host immunity determines the progress of the disease lethality and the need of care intensity. Evidence reports that direct – indirect stimulation of Vagus nerve bring to the modulation of proinflammatory cytokines with effective systemic anti-inflammatory effect and has shown anti – depressant effect in chronic treatment resistant depression. ⁽⁴⁾ Based on these assessments, we planned to introduce a medical based yoga deep breathing for activation of scalene and sternocleidomastoid muscles function during breathing, as an adjuvant to counteract incidence of mortality and better outcome during covid-19 disease.

Medical yoga protocol has been developed and designed to test a cost-effective care with training among covid-19 infected patients.

AIM OF THE STUDY:

This study is performed to determine whether yoga therapy is increasing the oxygen Concentration (Spo2) levels, among covid 19 (corona) patients.

METHODS:

3.

This study was done at Rajah Muthiah Medical College and Hospital Annamalainagar, Patients who were diagnosed as covid-19 (through RTPCR) patients, in the age group of 22 to 72 years, were included in this study Both genders were taken for this study. Informed consent were obtained from all the participants before starting this study.

Totally, 36 patients were included in the study (14 patients excluded). These 36 patients were non oxygen dependent patients, out of which 18 patients regularly practiced yoga therapy (n – 18), and considered as the Experimental group. The remaining 18 patients practiced yoga Therapy, once in a while (inactive group), were considered as the control group in this study.

All the patients were taught prarayama techniques like Brhamari, suryaBhedana and performed Linga mudra for a total duration of 5 days Pre and post – test was done with spo2 (pulse oxymeter). The data obtained were analysed with paired sample T – Test.

RESULTS:

In this study we found that

1. Experimental groups Showed the T. Value of 13.756 and significant p –value of 0.001.
2. Control group (non –active participation), t value of 0.566 and p – value of 0.579 (non – Significant).

Table 1: Paired Sample t-test of Yoga therapy group in pre and post value

Group	N	Mean	Standard Deviation	Standard Error Mean	t-value	Probability Value
Pre	18	94.61	2.23	0.52	13.756	0.001*
Post	18	96.39	1.91	0.45		

* Highly significant at 0.01 level

In the case of yoga therapy group in pre and posttest, post (96.39) scored higher mean value than pre test (94.61). The calculated ‘t’ value 13.756 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between the pre and posttest for yoga therapy group score among Corona patients.

Graph 1: Mean value of yoga therapy group in pre and post value

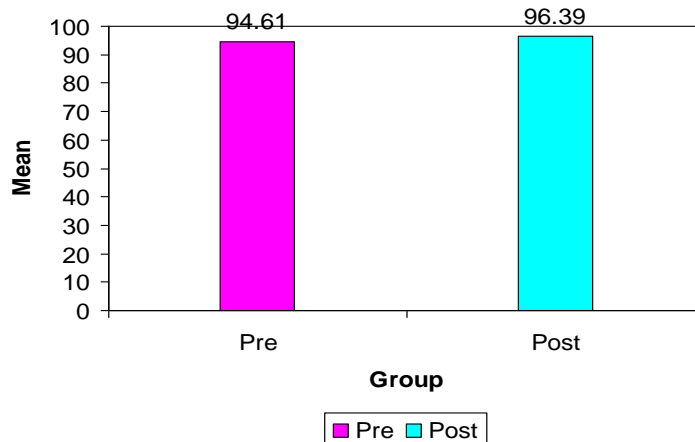


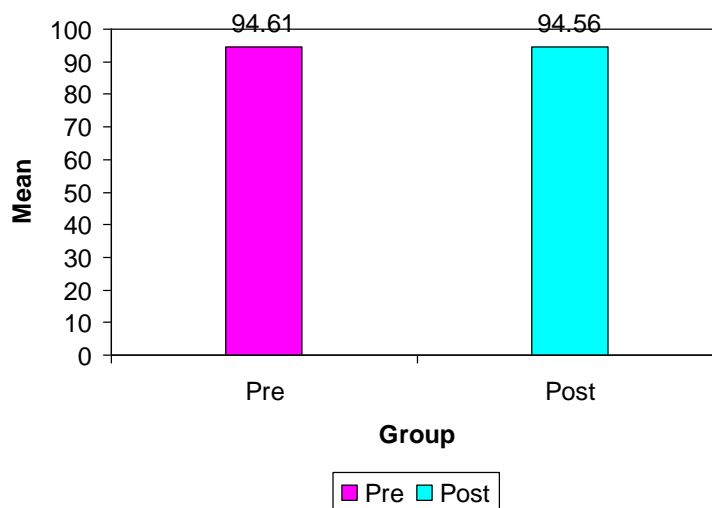
Table 2: Paired Sample t-test of control group in pre and post value

Group	N	Mean	Standard Deviation	Standard Error Mean	t-value	Probability Value
Pre	18	94.61	2.93	0.69	0.566	0.579 ^{NS}
Post	18	94.56	2.79	0.66		

NS – Not Significant

In the case of control group in pre and posttest, pre (94.61) scored higher mean value than posttest (94.56). The calculated ‘t’ value 0.566 and Probability value is 0.579 at not significance. Hence it is concluded that, there is a no significant difference between the pre and posttest for control group score among corona patients.

Graph 2: Mean value of control group in pre and post value



DISCUSSION

The covid – 19 pandemic is a global crisis. The rapid spread of covid – 19 around the world and the

subsequent lockdown in almost all countries has forced resulted the entire population in to confinement.⁽⁵⁾

Corona virus – Disease (or) Severe Acute respiratory disorder cov – 2 (or) covid -19 pandemic threatens patients, Societies and healthcare system around the world. Morbidity and lethality have a direct link with the early vicious circles triggered by an acute microcirculation endotheliopathy, a correlated coagulopathy, up to late hypoxic damage of multi – organ tissue. The host immunity determines the progress of the disease, its lethality and the need for care intensity. The Clinical course of the infection consists of three stages of which only the third, which intervenes in a low incidence of patients, need of hospitalization for severe hyper inflammatory syndrome including the Acute Respiratory Failure.

Coronavirus is a large enveloped single stranded RNA virus, measuring 60-140 nm in diameter. It shows distinctive spikes giving the appearance of a solar corona.

In early infection, the SARS Cov-2 target cells around the nasal bronchial epithelial cells and pneumocytes. The virus spikes protein (s) binds the Angiotensin converting enzyme 2(ACE2) receptor along the type 2 trans membrane serine protease (TMPRSS2) from the Host cells. These receptors are expressed particularly in type 2 pneumocytes.

In later stages of infection, the virus infects the pulmonary capillary endothelia cells and pericytes. This process, then, triggers the inflammatory reaction and the system of monocytes and neutrophils which evolves to diffuse the alveolar damage. In severe infection there is a fulminant activation of the coagulation cascade with microthrombus formation, pulmonary embolism and variable size lung infarcts among critically ill Patients. ⁽⁶⁾



Fig-1: Patient performing Lingamudra



Fig-2: Patient performing Brhamari Pranayama



Fig-3: Patient performing Surya bhedana Pranayama

DIFFUSE ALVEOLAR DAMAGE

Histological findings, in deceased patients with covid – 19, showed predominantly diffuse alveolar damage, which comprises in some cases a predominance of fibrin while in other the predominant pattern was an organizing acute lung injury, depending in the length of the disease. The leading cause of death is hypoxic respiratory failure from acute respiratory distress syndrome and the histological features are those of a diffuse alveolar damage, with Extensive thrombosis and vascular damage. ⁽⁷⁾

During 2004, the SARS Cov pandemic, role of nitric oxide in its management is well demonstrated. Nitric Oxide (No) reversed the pulmonary hypertension, improved severe hypoxia and shortened the stay in ICU and ventilatory support. Nitric oxide increased the Survival rate. The genetic composition of corona virus (SARS – Cov) is almost similar to covid-19 and this indicates good chances of effectiveness or enhancement in results by Nitric oxide along with other modes in treatment of Covid- 19. ⁽⁸⁾

It has been proved by studies that serendipity humming increase in No (Nitric oxide) expression dramatically. ⁽⁹⁾ It is estimated that humming increases the endogenous generation of nitric oxide level by 15-fold. Hypoxia, in ARD syndrome, leads to blood coagulation by depression of body defence anticoagulatory and fibrolytic properties along with metabolic acidosis. If we go in to hypoxic hypercapnic state, no hypercoagulation will take place. ⁽¹⁰⁾ Surya Bhedana Breathing is energetically associated with our bodies heating energy, symbolised by the “sun” with syllable “HA”. Surya Bhedana is

said to stimulate the brain and increases body heat which causes “sympathetic nervous system” stimulation. ⁽¹¹⁾ Linga mudra (mudra of heat) generates heat in our body. Practicing Linga Mudra stops production of phlegm and gives power to lungs. It cures severe cold and bronchial infection. Linga mudra invigorates the body. ⁽¹²⁾

So, in this study we have selected two pranayamas and one mudra - the two pranayama are Surya Bhedana and Brhamari, the mudra is Linga Mudra. Totally, 36 patients have participated in this study (14 patients excluded due to their variability on oxygen dependence). All the patients were non oxygen dependent patients. All the patients were taught Pranayama techniques like Brhamari, SargaBhedana and performed Linga Mudra. Out of 36 patients, totally 18 patients, who performed yoga Therapy techniques regularly (5 days), were considered as Experimental group (Group-A) and the other 18 patients who practiced yoga therapy once in a whole (in active participation), were considered as the control group (Group-B).

So, Group B (control group) were informed to perform their routine activities and breathing exercise. Group A (Experimental group - 18 pts) Performed yoga therapy techniques regularly such as Brhamari, Surya Bhedana and Linga Mudra. For Both Experimental and control groups, Pre and post SPO2 were taken (duration between pre and post is 5 days). The SPO2 was taken by using standard pulse oxymeter on both times. Both assessment of SPO2 were analyzed using paired ‘t’ test. The correlated

comparison, done between experimental and control group (Pre and post values), obtained the result as:

- Experimental groups Showed the T. Value of 13.756 and significant p –value of 0.001.
- Control group (non –active participation, t value of 0.566 and p – value of 0.579 (non – Significant).

These results showed the Experimental group (Yoga Therapy Performed group) as having much significant values when compared to control group. The yoga therapy techniques which were given such as Brhamari, suryaBhedana, and Linga mudra were effective treatment adjunctives. Brhamari enhances the expression of Nitric oxide and increased the carbon dioxide by extended exhalation and alkaline pH prevents coagulopathies and morbidity due to covid – 19. Nitric oxide inhibits the viral protein and RNA. Nitric oxide synthesis reduces the yield of progeny virus by 82% by virtue of its antiviral effect, which reduces the replication of corona virus.⁽¹³⁾

Nitric oxide may also stimulate ciliary motility. Serendipity humming increase *No* Expression dramatically. This is as a consequence of oscillating sound wave and affecting air exchange in the sinus. The gas exchanges, in the sinus, by humming in every single Exhalation, while it takes 5 min to 30 min in Quite Breathing for exchange of air in sinuses. *No* (Nitric oxide) acts like *aaerocrine* hormone to enhance pulmonary vascular resistance.⁽¹⁴⁾

Nitric oxide is anti-inflammatory and contributes to non - specific host defence against bacterial, viral, fungal and parasitic infections, hence it takes care of infection in the body Humming (Brhamari) acts as a sonic cleanser, cures the infection of Respiratory tract.⁽¹⁵⁾ It is estimated that the Humming increases the endogenous generation of nitric oxide level by 15-fold as compared with the quite exhalation. Hypoxia, in ARD syndrome, leads to blood coagulation by depression of body defence anticoagulatory and Fibrolytic properties along with metabolic acidosis.⁽¹⁶⁾

Hence pranayama techniques enhance the expression of Nitric oxide and increase extended exhalation of, carbon dioxide and alkaline pH and prevents the coagulopathies and morbidity occurring due to covid-19.⁽¹⁷⁾

CONCLUSION:

The proposed hypothesis is based on the principle of physiology of Nitric oxide, carbon dioxide and pH of body. From the results, it is concluded that yoga therapy techniques enhance O₂ saturation (SPO₂) for Corona patients. Further studies are needed to improvise and implement the techniques applicable to all corona patients.

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