

How to Cite:

Dalabehera, S. P., & Mishra, P. (2022). Efficacy of vibratory shaking technique in improving the vitals in post COVID ICU patients. *International Journal of Health Sciences*, 6(S8), 1306–1309. <https://doi.org/10.53730/ijhs.v6nS8.9977>

Efficacy of vibratory shaking technique in improving the vitals in post COVID ICU patients

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Abstract---Background: SARS-CoV-2 virus lead to the start of pandemic in 2019. With the variation in COVID 19 symptom involving lungs its need for intensive treatment in a hospital setting is emerging. Even after recovery the patients need to be stabilized for their oxygen saturation and other vitals for which they need invasive mechanical ventilation and chest physiotherapy. Vibratory shaking technique is a form of physiotherapeutic maneuver which helps in stabilizing the vitals and maintaining spo2 when delivered by a trained therapist. Objectives: To find out the efficacy of vibratory shaking technique to improve Oxygen saturation and vitals in post COVID, ICU patients. Methods: The patients admitted in ICU after post COVID recovery were given with vibratory shaking technique to improve their oxygen saturation and respiratory rate. The pre and post test value showed significance. Result: Vibratory shaking technique was found to be effective in improving the vitals in post COVID, ICU patient. Conclusion: For post COVID patient's chest physiotherapy i.e. vibratory shaking technique should play an important part for improving the vitals of patient who are still on ventilator.

Keywords---vibratory shaking technique, improving vitals, post COVID ICU, patients.

Introduction

SARS-CoV-2 virus lead to the start of pandemic in 2019. As the virus had varied symptoms in individuals which was managed with a multimodal and experimental approach. With the COVID 19 symptoms focusing on lungs came the need of better therapeutic approaches for maintaining oxygen saturation and other vitals even after post COVID 19 recovery. The stay in hospitals and the need

for intensive integrated treatment for various conditions with low tidal volume and plateau pressure raised. Even after recovery the patients need to be stabilized for their oxygen saturation and other vitals for which they need invasive mechanical ventilation and chest physiotherapy

Chest physiotherapy performed by the use of a technique termed vibratory shaking technique which helped in airway clearance and in stabilizing the oxygen saturation level. This technique included rhythmic oscillatory action which composed combination of both coarse and fine movement. Vibratory shaking technique involves the therapist hands to be placed placing the hands on the patient's chest wall and applying an oscillatory action in the direction of the normal movement of the ribs during expiration, using the physiotherapist's body weight.¹ This is thought to lead to production of phasic energy waves, which are transmitted to the airways during expiration and may augment expiratory flow.

Procedure and Methods

A randomized study was conducted and 86 patients were selected those who were mechanically ventilated after COVID recovery aged between 40-60 years of age. The patients were selected from ICU SUM & IMS hospital, SOA Deemed to be university during the period of March to June 2021. The patient received chest physiotherapy i.e. vibratory shaking technique & positioning. The patients were given 2 session a day for the first three days of ICU admission with each session lasting for 30 minutes. The technique consisted of alternate coarse and fine movements for 5 minutes each for three cycles followed by positioning or postural drainage by elevating the head end to 30-45 degrees. The vitals of the patient's were constantly monitored (ECG, heart rate, Respiratory rate, Spo2).

Inclusion criteria: Patients mechanically ventilated during post COVID recovery phase and aged between 40-60 years of age.

Exclusion criteria: Patients with co morbid conditions like acute pulmonary edema, untreated pneumothorax and open heart surgeries, admission with tracheotomy

Statistical analysis

Statistical analysis was performed using IBM SPSS version 20. test used to compare the pre and post test mean values of respiratory rate and spo2 was student T test. The level of significance for all statistical tests was set at $p < 0.05$.

Results

There were an increase in spo2 and normalizing of respiratory rate.

Discussion

This study was conducted to evaluate the effect of vibratory shaking techniques on spo2 and respiratory rate. There were an increase in spo2 and decrease (normalizing) in respiratory rate. Zeyu *et al.*¹⁰ investigated the clinical effect of the chest physiotherapy for the postoperative sputum excretion. After chest

physiotherapy, the increase of pao2 was significant higher than before after three days.

Farahat et al.,¹¹ investigated the response of mechanically ventilated to chest physical therapy, there was significant increase in pao2 after chest physical therapy (positioning, percussion, vibration and suction.) in the study group. Zeng et al.¹² concluded that chest physical therapy decrease the incidence of ventilator associated pneumonia and increase in pao2 in his study group who received comprehensive chest physical therapy. Chen et al.¹³ found that sao2 was significantly increased after chest physical ventilated to chest physical therapy, there was significant increase in sao2 after chest physical therapy (positioning, percussion, vibration and suction.) in the study group.

Paratz et al.¹⁴ demonstrated that there was a decrease in pao2 after manual hyperinflation in patient with acute intrapulmonary lung injuries. This may be as results of the candidates were having acute intrapulmonary lung injuries that were excluded from this study, besides applying manual hyperinflation only. Berny et al.¹⁵ demonstrated that a slight decrease in partial pressure of arterial oxygen was observed in his study group following mobilization in ICU, this result may differs from this current study used a comprehensive chest physical therapy program was added including percussion, vibration, manual hyperinflation and positioning besides, limb exercises.

Monica et al.¹⁶ demonstrated no increase in sao2 in a prospective, interventional study a respiratory physiotherapy was initiated, twice a day, to a randomized group of mechanical ventilated patients this disagreement resulted from smaller sample size than used in this current study. This study wanted to analyze the efficacy of Vibratory Shaking technique and intended to prove its importance as a method of use in chest physiotherapy Maneuver. No study has been conducted yet on the efficacy of Vibratory shaking technique as a chest physiotherapy measure playing vital role in Post COVID 19 ICU patient and looking into the incidence of disease severity it should be done in wider population.

Conclusion

The results support the importance of adding chest physiotherapy program to early post COVID recovery phase patients for stabilizing their vitals and decreasing complications, duration, costs & psychological disorders in patients with ICU.

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