



## EFFECT OF YOGIC EXERCISE ON OXYGEN SATURATION LEVEL IN CHRONIC SMOKERS

### Physiology

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### ABSTRACT

Cigarette smoking is common habit since long time. Lung diseases caused by smoking include COPD, which includes emphysema and chronic bronchitis. It also cause decrease oxygen saturation level in blood. Many studies shown that Yogic exercise have beneficial effect on body so this present study aimed that Intervention of yogic exercise on oxygen saturation level in chronic smokers. Totally 90 individual who are sedentary and chronic smokers participated in this study as subject. All the subjects were equally divided in two groups, study group and control group. The yoga therapy was given to study group only. And the result is shown that oxygen saturation level of the study group is significantly higher after yogic exercise.

### KEYWORDS

#### INTRODUCTION

oxygenation is the most important function of respiratory system. Oxygen saturation is a sensitive indicator of disease severity in clinical conditions such as ongoing asthma attacks with ventilator perfusion incompatibility, chronic lung disease, acute bronchiolitis, and pneumonia.<sup>1</sup>

Smoking affects the health of both Active smokers and passive smokers exposed to cigarette smoke. The most effective components found in cigarette smoke; Nicotine, CO and hydrogen cyanide.<sup>2</sup>

After smoking a cigarette, the concentration of nicotine on the arterial blood reaches from 31 ng/ml to 41 ng/ml. Nicotine absorption change depending on the amount of smoke to be inhaled, the depth and duration of smoke inhalation, and the pH of smoke<sup>3</sup>.

Oxygen saturation is a clinical data. Oxygen saturation is used as early diagnosis of hypoxia that is source of vital problems such as oxygen deficiency of inhalation air, respiratory activation decrement about of muscular diseases, respiratory diseases due to decrement in airway resistance, reduced diffusion capacity, anemia, circulatory inadequate, poisoning. Saturation of arterial blood to oxygen is vital important for patient, athlete, sedentary and all individuals [4,5]. Many previous studies showed that smokers were significantly lower value of SpO<sub>2</sub> than Non Smokers individuals.<sup>6</sup>

Yogic exercise is the system that prevents and cures various diseases and disorders through yogic practices. The yogic practices concentrates on purification of the body and mind, and through this integrated holistic approach one can overcome several kinds of afflictions in life.

#### AIMS AND OBJECTIVE

Intervention of yogic exercise on oxygen saturation level in chronic smokers.

#### MATERIAL AND METHODS

This study was conducted in department of Physiology, R. N. T. Medical College, Udaipur. Totally 90 individual who are sedentary and chronic smokers participated in this study as subject. All participants were informed about the aim of the research and the contents of that.

All the subjects were equally divided in two groups, study group and control group. The yoga therapy was given to study group only. Daily sessions of classes were taken in the morning from 8 AM to 9 AM for three months. The Yogic practice includes a series of Asana, Pranayama, and Meditation and followed by the relaxation techniques. Two readings of SpO<sub>2</sub> were taken both of the study group and control group. First recording taken of both the groups before the starting yogic exercise and second recording of study group was taken after three months of yogic exercise and similarly, second recording of

control group was taken after three months without yogic exercise.

Oxygen Saturation Measurement (SpO<sub>2</sub>): To record the oxygen saturation of the hemoglobin, the pulse oximeter device is used, recording the changes in the color spectrum of oxyhemoglobin by photoelectric method. Pulse oximeters measure arterial oxyhemoglobin concentration by measuring light transmittance from pulsatile vascular tissue in two wavelengths. Pulse oximeter can be used in the finger, ear and other tissues

#### RESULT

The comparisons of SpO<sub>2</sub> values are shown in table 1. As a result of the comparison, in Study Group significantly higher value of SpO<sub>2</sub> found after three month of yogic exercise. And comparison of SpO<sub>2</sub> values in control group had no significant changes after three months without yogic exercise.

**Table 1 showing Mean values of SpO<sub>2</sub> of study group and control group.**

Groups	Recordings	Mean ± SD	t	P
Study Group	Base line	94.04 ± 2.236	7.072	<0.0001
	After three months	96.16 ± 1.492		
Control Group	Base line	93.96 ± 2.174	1.431	0.1596
	After three months	94 ± 2.143		

#### DISCUSSION

Our findings is correlates with previous studies which shown that there was a significant effect of selected yogic exercises on the blood oxygen level. Cigarette smoking is the most commonly encountered tobacco-related risk factor for COPD.<sup>7</sup> Cigarette smoke contains an extremely high concentration of oxidants. The reactive oxidant substances generated by smoking induce inflammation in the lung and its airway<sup>8</sup>; cigarette smoking causes an inflammatory process in the central airways, peripheral airways, and lung parenchyma, which is present even in smokers with normal lung function<sup>9</sup>. Studies have shown that in bronchial biopsies obtained from central airways, smokers have chronic inflammatory changes, with increased numbers of specific inflammatory cell types in different parts of the lung, and structural remodeling resulting from repeated injury and repair<sup>10</sup>.

Yogic exercise improves oxygen saturation level, the possible explanation for this could be that Yoga improves the blood circulation; there is better perfusion of tissues also, which increases the strength of respiratory muscles. More oxygen binds with hemoglobin. With pranayama practice, there can be an increased intake of oxygen as much as five times. This means five times of carbon dioxide is gotten rid from the body. There can be great improvement in the health by doing pranayama.

Due to the even expansion of all the alveoli, a vast expanse of alveolar membrane is available for exchange of gases. This surface is about 50

m<sup>2</sup> in extent, which is 20 times the entire body surface. The larger the surface available for the process of diffusion, the better is the process. The purpose of yoga breathing exercises is to supply the body with oxygen and cleanse it of carbon dioxide and other toxins. Generally, a small portion of lung capacity is been utilized. This inadequate supply of oxygen results in improper waste disposal from the body. The body functions are slowed down and the cells/tissues fail to regenerate themselves due to lack of sufficient energy.<sup>11</sup>

## CONCLUSION

Our present study concluded that Cigarette smoke cause decrease oxygen saturation level due to the reactive oxidant substances generated by smoking induce inflammation in the lung and its airway. Regular yogic exercise done by chronic smokers improves the oxygen saturation level in blood.

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