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A Comparative Study of Pulmonary Function Tests between Practitioner of Sudarshan Kriya Yoga and Sedentary Individuals

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Abstract: Yoga consists of a number of different practices with the coordination of controlled ventilation, asanas and stretching exercises. Yoga is highly efficient method in improving pulmonary function parameters in all individuals. Hence the present study has been conducted to compare the lung function parameters between practitioner of Sudarshan Kriya yoga and sedentary workers. This study was carried upon 100 healthy males in the age group of 18-55 years. The subjects were divided into two groups on the basis of physical activities under taken i. e, Sudarshan Kriya Yoga and sedentary workers. One group comprised 50 subjects in SKY group and other had 50 subjects in the sedentary group. The parameters used as determinants of lung function were predicted percent of means of FVC, FEV1, FEV1/FVC ratio and PEFR recorded as per standard procedure using RMS- Helios spirometer. In our study the SKY group was having significantly higher mean value of FVC, FEV1, FEV1/FVC ratio, and PEFR as compared to Sedentary group.
Keywords: Sudarshan Kriya Yoga, Sedentary lifestyle, Pulmonary Functions.

INTRODUCTION

Yoga is considered to be a very good exercise for maintaining proper health and also has a profound effect on the lung functions of an individual. It is claimed that yogic practices help in prevention, control and rehabilitation of many respiratory diseases.

Now-a-days, more persons are interested in physical fitness than any time before. Bufferalo health study concluded that pulmonary function is a long-term predictor for overall survival rates in both genders and could be used as a tool in general health assessment [1].

Several studies had been conducted to prove the role of breathing exercises in the improvement of pulmonary functions in healthy individuals [2-5]**.**

Yoga has demonstrated an improvement in respiratory function. Yoga consists of a number of different practices, the most common of which are the pranayama, the coordination of controlled ventilation and the asanas or stretching exercises. Pranayama requires breath holding which may result in increased parasympathetic control of respiratory centres [6].

Since centuries Rishis and Sages have recommended and enlightened us with practices of yoga, meditation and pranayam for healthy life. It is said that yogic practices have certain beneficial effects in prevention as well as management of psychosomatic and other diseases. Many people try them as an alternative to therapeutic management. Sudarshan Kriya Yoga (SKY) is one such type of practice recently introduced by H.H. Sri Sri Ravishankarji [7]. Sudarshan Kriya and its accompanying practices (SK&P), taught by the Art of Living Foundation world-wide, are management/health promotion techniques whose health benefits are being validated by modern medical science [8]. The Sudarshan Kriya is a unique cyclical controlled yogic breathing process developed from ancient Indian science of Yoga [9].

Yoga, an ancient Indian science has been practiced as a healthy way of life. Recently, Yoga has been adopted as an approach to health within alternative medicine so I have conducted this study to find out the effect of yoga (SKY) on pulmonary Function Tests.

MATERIAL AND METHOD

This study has been undertaken to observe the effect of Sudarshan Kriya Yoga (SKY) on Pulmonary Functions of healthy male of age group 18-55 years. The pulmonary functions of Sudarshan Kriya Yoga were compared with the sedentary workers. This study was conducted in the Department of Physiology, S. P. Medical College, and Bikaner.

The subjects of Sudarshan Kriya Yoga group were taken from Art of Living centre, Rani Bazar, Bikaner and sedentary workers were selected from the Bikaner City.

The readings were taken in sitting position using computerized Spiro-meter (RMS –HELIOS 401). Subjects in the study were aged 18 to 55 years. Definitions : Sedentary lifestyle was defined as per center for disease control and prevention, as no leisure-time physical activity, or activities done for less than 20 minutes or fewer than 3 times per week.

Type of study: Cross-Sectional Study
GROUP I: 50 Persons practising Sudarshan Kriya Yoga.
GROUP II: 50 Persons of sedentary lifestyle.

Inclusion Criteria:

Selection of subjects

- Healthy Male
- Age group 18-55 years
- Physically and mentally capable of adequate co-operation during the performance of the tests.
- Group I- Practising Sudarshan Kriya Yoga (SKY) from last three years.
- Group II - Sedentary lifestyle Persons

Exclusion Criteria

The patients suffering from chronic bronchitis, asthma tuberculosis, cardiovascular disease and smokers were excluded from the study.

Analysis of observation

Standard statistical methods were applied for analysis of the observation. The mean values of various parameters were calculated separately in various groups of the subjects.

Statistical analysis

The data were expressed as mean±SD. Statistical analysis were performed according to an intention to treat strategy. Quantitative data were presented as mean±SD and the student's unpaired't' test was used to compare the differences. All p values were 2 tailed, p values <0.05 was considered significant. Analysis was performed by using SPSS version 6.0 computer software.

Following parameters were measured

Pulmonary function tests

- FVC- Forced vital capacity.
- FEV_1- Forced expiratory volume in 1 second.
- FEV_1/FVC -Ratio
- PEFR- Peak Expiratory Flow rate.

RESULT

Compare the lung functions parameters between Sudarshan Kriya Yoga subjects and sedentary lifestyle subjects is shown in table-1.

Forced vital capacity (FVC)

The mean value of FVC of SKY group (81.12) is higher than the mean value of Sedentary group (76.28). The difference of mean of FVC was significant between the subjects of SKY group and sedentary group (p=0.0436).

Forced expiratory volume in 1 second (FEV1)

The mean value of FEV1 of SKY group (91.80). Is higher than the mean value of sedentary group (86.46). The difference of mean of FEV1 was significant between the subjects of SKY group and sedentary group (p=0.0405).

FEV1/FVC RATIO

The mean value of FEV1/FVC of SKY group (113.3) is higher than the mean value of sedentary group (109.5). The difference of mean of FEV1/FVC was significant between the subjects of SKY group and sedentary group (p=0.0348).

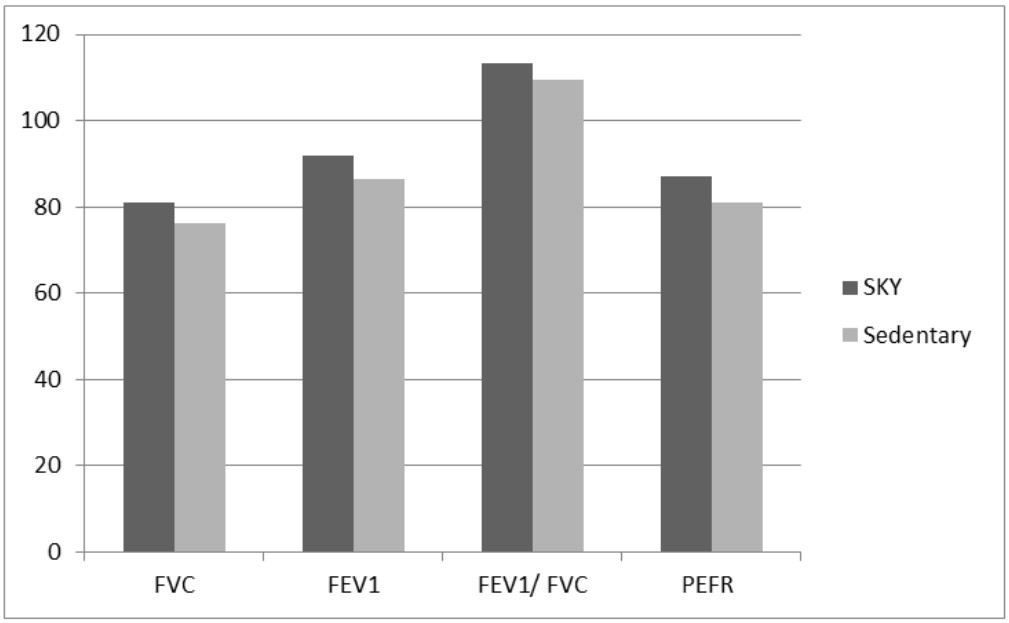
Peak expiratory flow rate (PEFR)

The mean value of PEFR of SKY group (87.18) is higher than the mean value of sedentary group (80.96). The difference of mean of PEFR was significant between the subjects of SKY group and sedentary group (p=0.0212).

This study showed that Forced Vital Capacity (FVC), Forced Expiratory Volume in 1 second (FEV1), FEV1/FVC Ratio and Peak Expiratory Flow Rate (PEFR) value were significantly higher in SKY group as compared to that sedentary worker.

Table-1: **Showing the mean value of pulmonary function tests between sudarshan kriya yoga group and sedentary group.**

S. No.	Pulmonary functions parameters	SKY Group (Mean±S.D)	Sedentary Group (Mean±S.D)	t Value	P Value
1	FVC	81.12±12.85	76.28±10.74	2.044	0.0436
2	FEV_1	91.80±13.24	86.46±12.46	2.076	0.0405
3	FEV_1/ FVC	113.3±5.192	109.5±11.35	2.141	0.0348
5	PEFR (lit./sec)	87.18±13.58	80.96±12.97	2.343	0.0212



Graph-1: Showing the Mean value pulmonary functions in Sudarshan Kriya yoga group and sedentary group

DISCUSSION

Yoga is a state which is defined as a high level of consciousness achieved through a fully rested relaxed body and a fully awake and relaxed mind [10].

SKY is a unique breathing process not practiced as a single technique but is integrated with asanas, pranayama, meditation and attitude training. This type of yoga is said to heal and purify within, is a natural and non-invasive stress relieving technique [2] An increase of 19% in oxygen consumption has been observed during the practice of one type of pranayama called the Ujjayi Pranayama [11]. Breathing through a particular nostril, while performing the Surya Anuloma Viloma (right nostril breathing), has been shown to increase oxygen consumption by 28% [12].

The Sudarshan Kriya is a rhythmical cyclical controlled breathing process with roots in traditional yoga [13] it has been shown in previous studies that beneficial effects of yoga become established between 6 to 12 weeks [14].

Breathing through one nostril in Anulomvilom pranayama further increases the resistance. The effects of resistance training on skeletal muscle are well documented [1]. For long SKY, there is significant effect on Tidal Volume and oxygen saturation. Higher peak expiratory flow rates and FEV1 could be explained due to better strengthening of respiratory muscles in yogis. Skeletal muscle control many crucial elements of aerobic conditioning including lung ventilation. Repeated inspirations to TLC and breath holdings as done during pranayam can lead to increase in the maximal shortening of the inspiratory muscles which has been shown to improve the lung function parameters [7].

CONCLUSION

In our study Sudarshan kriya Yoga subjects had significantly better lung functions as compared to sedentary workers. People with sedentary lifestyles had lowest pulmonary function parameters. In this busy age

people should try to be involved in such physical activities for better health yield for the time spent.

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