



Effect of yoga exercise on pulmonary function in young medical students

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ABSTRACT

Yoga is well known for its contribution towards maintenance of normal health since Vedic period. Medical students have been shown to exhibit early risk factors for chronic diseases due to lack of exercise and stress due to their curriculum. The study was designed to assess the effect of yoga exercise on Lung Function among young medical students. 60 male first year MBBS students volunteers age ranging from 17 to 19 years, studying at Madras Medical College, Chennai were recruited for present study. They were taught yoga and allowed to practice yoga daily for 45 minutes for 10 weeks. Parameters like weight, BMI, chest expansion, Respiratory rate, Mean Expiratory Pressure (MEP) and Mean Inspiratory Pressure (MIP) and spirometric parameters like FVC, FEV₁ and PEFr were recorded before and after the study. A significant reduction in weight, increase in chest expansion, MEP, MIP, FEV, FEV₁ and PEFr with p value < 0.001 . No significant change in BMI, respiratory rate was observed. All Medical students along with their busy curriculum as to be trained and encouraged to practice yoga daily to improve their lung function and life pattern.

Keywords: Yoga exercise, Medical students, Spirometric parameters, MEP, MIP

INTRODUCTION

Yoga is well known for its contribution towards maintenance of normal health since Vedic period. Asana means posture, and consists of bodily manipulations such as changing in postures of body and stretching of muscles and joints. Pranayama means breathing exercises and regulates the flow of Prana a subtle form of vital energy in the body. Now-a-days yoga has become very popular alternative medicine for its minimal expenditure and simplicity. Short term yoga and pranayama training in particular in various age groups produced significant improvement in lung ventilatory functions in the form of lowered respiration rate, increased forced vital capacity, FEV₁, PEFr, maximum breathing capacity, and breath holding time.^[1,2,3] Even though medical college students have a better knowledge about healthy lifestyle and dietary habits than other college students,^[4] they have been shown to exhibit early risk factors for chronic diseases due to lack of exercise and stress due to their curriculum.^[5] In a study conducted in students of Kerman university, china, it is shown that 40% students are prone to develop symptoms of exercise induced bronchospasm with fall in FEV₁, FVC, FEV₁/FVC ratio.^[6] Since yoga is also one of the modality of exercise, the present study was designed to assess the effect of yoga exercise on Lung Function among young medical students.

MATERIALS AND METHODS

60 male first year MBBS students volunteers with no previous exposure of yoga training, age ranging from 17 to 19 years, studying at Madras Medical College, Chennai were motivated and recruited for present study. Students with Medical or surgical illness were excluded from the study. After briefing about the study protocol, informal consent was obtained from them.

The subjects were taught the following asanas and pranayama during the training period of 2 weeks. Asanas taught includes Sukhasana, Ardha Padmasanam, Vajrasana, Bhujangasana, Salabhasana, Pavanamuktasana, Dhanurasana, Halasana, Sarvangasana, Shanthiasana, Mukh bhastrika, Anulomaviloma, Surya Nadi bhedhana Pranayama Chandra Bedhana Pranayama and Nadisodhana Pranayama.^[7] After the training period, 45 minutes

practice sessions were held regularly from Monday to Friday for a total duration of 10 weeks under expert Supervision to the yoga group.

They were insisted to have their lunch as early as possible so as to do the asanas at 4.00 p.m. The practice sessions started every day at 4.00 p.m with prayer followed by relaxation exercise, and then asanas and pranayama the whole exercise lasting 40 minutes. In practice schedule, each pose was held for 30 seconds and a short period of rest was given between the poses.

The students were subjected to following parameters, before and after study period.

PARAMETERS

ANTHROPOMETRIC EVALUATION

Weight, BMI, chest expansion and respiratory rate were measurement.

MAXIMUM EXPIRATORY PRESSURE

Maximum Expiratory Pressure (MEP) was determined by asking the subject to blow against Mercury Column of a 'U' Shape manometer after taking in a full breath. The maximum level at which the mercury column could be maintained for about 3 sec. was noted.^[2]

MAXIMUM INSPIRATORY PRESSURE (MIP)

MIP was determined by asking the subject to perform maximum inspiratory effect against the mercury column after breathing out fully. MIP that could be maintained for about 3 sec. was noted. It was ensured that the subjects did not use oral muscles to develop pressure or tongue to block the tubing.^[2]

SPIROMETRY

FVC, FEV₁ AND PEFR were measured by computerised turbine type spirometer (medspirometry). For each parameter, three trials at three minutes intervals were done and highest of the three values was used for statistical analysis.

STATISTICAL ANALYSIS

The data was analysed using student paired 't' test. P values of less than 0.05 was accepted as significant.

RESULTS AND ANALYSIS

Yoga training of 10 weeks produced a significant reduction in weight ($p < 0.001$), significant increase in HGS and HGE in subjects. It also produced a significant ($P < 0.001$) increase in chest expansion, MEP, MIP, FEV, FEV₁ and PEFR. No significant change in BMI, respiratory rate was observed. (Table:1)

Table:1 Effect on Various Parameters Before And After Yoga

Parameters	Yoga Group			
	Pre		post	
	Mean	SD	Mean	SD
Weight*	59.63	10.77	59.27	10.73
BMI	20.39	3.03	20.30	3.17
RR /min	18.70	1.99	17.47	1.55
Chest expansion * in cms	6.03	1.71	6.50	1.70
HGS*	189.53	33.89	203.93	26.09
HGE*	125.77	19.51	154.30	20.32
MEP*	43.43	11.18	46.60	10.56
MIP*	41.27	12.23	44.33	11.47
FEV*	2.88	0.43	3.24	0.41
FEV ₁ *	2.66	0.43	3.07	0.42
PEFR*	479.00	74.06	518.67	63.56

* p value less than 0.001

DISCUSSION

The significant increase of FEV₁, FEV₁/FVC and PEFR after yoga and pranayama training, which may attributed to increase in the strength and endurance of respiratory muscles [8] and weight loss. [9]

In the present study, MEP and MIP increased significantly following ten weeks of yoga training in yoga group subjects. The increase in MEP and MIP in yoga group indicates that yoga training improves the strength of the expiratory as well as inspiratory muscles.^[2]

CONCLUSION

Improving Vital capacity, PEFr which is a critical component of good health. Yoga exercise is unique in contrast to other modalities of exercise it improves the lung function by increasing the power and endurance of respiratory muscles and reducing the weight. Respiratory muscles are vital and evaluation of their performance is important. Respiratory pressures are specific and sensitive indices of respiratory muscle strength and they are easy to measure and reproducible. The evaluation of respiratory muscle strength is important from physiological as well as clinical point of view. This study suggest that all Medical students along with their busy curriculum as to be trained and encouraged to practice yoga daily to improve their lung function and life pattern. Yoga exercise is very much safely recommended for people with exercise induced bronchospasm.

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