

A study effects of yogic practice on respiratory system in apparently healthy volunteers at tertiary health care center

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Abstract

In the present study, the focus is on the effect of yoga (asanas and pranayama) on the lungs as pulmonary function has been identified as a long-term predictor for overall survival rates as well as a tool in general health assessment. **Aims and Objectives:** To study Effects of yogic practice on Respiratory system in apparently healthy volunteers at tertiary health care center. **Methodology:** This was a cross-sectional study carried out in the department of Physiology during the six month period i.e. January 2019 to June 2019 in the six month period the 50 apparently healthy volunteers with baseline comparable L.F.T were recruited for the study out of these 25 volunteers were not given any intervention (Non –Yogic group) and 25 given training of Yogasana and Pranayama by expert Yoga teacher (Yogic Group B) for 6 weeks duration. The PFT parameters like FVC (L/min), FEV1 (L/min), FEV1/FVC ratio (%), FEF 25 75% (L/min), PEFR (L/s), SVC (L/min), MVV (L/min). The statistical analysis was done by unpaired t-test and calculated by SPSS 19 version software. Result : FVC (L/min) was 4.02 ± 0.54 and 2.98 ± 0.34 ($P < 0.001, t = 5.58, df = 48$); FEV1 (L/min)- 3.84 ± 0.17 and 2.82 ± 0.27 ($P < 0.05, t = 3.92, df = 48$); FEV1/FVC ratio (%) was 98.29 ± 3.78 and 92.53 ± 4.89 ($P < 0.001, t = 11.98, df = 48$); FEF 25 75% (L/min) was 4.93 ± 0.13 and 3.53 ± 1.45 ($P < 0.01, t = 4.52, df = 48$); PEFR (L/s) was 7.03 ± 1.23 and 4.92 ± 2.56 ($P < 0.005, t = 6.79, df = 48$); SVC (L/min)- 3.84 ± 0.25 and 1.78 ± 0.38 ($P < 0.001, t = 7.94, df = 48$); MVV (L/min) was 95.14 ± 4.97 and 92.19 ± 5.62 ($P < 0.001, t = 12.76, df = 48$) Significantly higher in Yogic Group as Compared to Non Yogic Group volunteers. **Conclusion:** It can be concluded from our study that the lung function by various parameters of LFT showed there is significant improvement of lung function.

Key Word: yoga (asanas and pranayama), PFT (Pulmonary Function Test)

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INTRODUCTION

Physical activity in the form of Exercises if performed regularly, have a beneficial effect on the various systems

of the body. The modality of exercise that is most beneficial and economic for masses has now become the topic of research.¹ The conventional exercises (endurance exercises like walking, jogging, running, swimming, cycling, etc), which give stress on cardiovascular and respiratory systems and test the responses of these systems, are very popular. On the other hand, ancient yogic exercises which have been claimed to benefit human body on multiple fronts are also getting popularity all over the world.² In the present study, the focus is on the effect of yoga (asanas and pranayama) on the lungs as pulmonary function has been identified as a long-term predictor for overall survival rates as well as a tool in general health assessment.³ yoga have been reported to improve the pulmonary functions to a great extent and it

involve physical activity as well as breathing exercise.^{4,5} Hence we have studied the effectiveness of Yogasana and Pranayama for the improving the pulmonary function test

METHODOLOGY

This was a cross-sectional study carried out in the department of Physiology during the six month period i.e. January 2019 to June 2019 in the six month period the 50 apparently healthy volunteers with baseline comparable L.F.T were recruited for the study out of these 25 volunteers were not given any intervention (Non –Yogic group) and 25 given training of Yogasana and Pranayama by expert Yoga teacher (Yogic Group B) for 6 weeks duration. The PFT parameters like FVC (L/min), FEV1 (L/min), FEV1/FVC ratio (%), FEF 25-75% (L/min), PEFR (L/s), SVC (L/min), MVV (L/min). Ethical approval was taken from Institutional ethical committee. The statistical analysis was done by unpaired t-test and calculated by SPSS 19 version software.

RESULT

Table 1: Distribution of the patients as per the age and sex

	Non-Yogic (n=25)	Yogic (n=25)	t-value and p-value
Age (Yrs.)	31.45 ± 3.98	32.45 ± 4.17	t=0.78, df=49, p>0.05
Sex			
Male	15	14	X ² =0.34, df=1, p>0.05
Female	10	11	

The age was comparable 31.45 ± 3.98 and 32.45 ± 4.17 (t=0.78, df=49, p>0.05); The ratio of male to female was 1.50 : 1 and 1.30: 1 was also comparable (X²=0.34, df=1, p>0.05).

Table 2: Distribution of the patients as per the PFT parameters

PFT parameters	Non-Yogic (n=25)	Yogic (n=25)	p-value
FVC (L/min)	2.98±0.34	4.02±0.54	P<0.001, t=5.58, df=48
FEV1 (L/min)	2.82±0.27	3.84±0.17	P<0.05, t=3.92, df=48
FEV1/FVC ratio (%)	92.53±4.89	98.29±3.78	P<0.001, t=11.98, df=48
FEF 25-75% (L/min)	3.53±1.45	4.93±0.13	P<0.01, t=4.52, df=48
PEFR (L/s)	4.92±2.56	7.03±1.23	P<0.005, t=6.79, df=48
SVC (L/min)	1.78±0.38	3.84±0.25	P<0.001, t=7.94, df=48
MVV (L/min)	92.19±5.62	95.14±4.97	P<0.001, t=12.76, df=48

FVC (L/min) was - 4.02±0.54 and 2.98±0.34 (P<0.001, t=5.58, df=48); FEV1 (L/min)- 3.84±0.17 and 2.82±0.27 (P<0.05, t=3.92, df=48); FEV1/FVC ratio (%) was 98.29±3.78 and 92.53±4.89 (P<0.001, t=11.98, df=48); FEF 25-75% (L/min) was 4.93±0.13 and 3.53±1.45 (P<0.01, t=4.52, df=48); PEFR (L/s) was 7.03±1.23 and 4.92±2.56 (P<0.005, t=6.79,

df=48), SVC (L/min)- 3.84±0.25 and 1.78±0.38 (P<0.001, t=7.94, df=48); MVV (L/min) was 95.14±4.97 and 92.19±5.62 (P<0.001, t=12.76, df=48) Significantly higher in Yogic Group as Compared to Non Yogic Group volunteers.

DISCUSSION

Yogic Asanas and Pranayama have been shown to reduce the resting respiratory rate. Furthermore, they increase timed vital capacity, and maximal voluntary ventilation, breath holding time, maximal inspiratory pressure and maximal expiratory pressure.⁶ Pranayama is an important component of Yoga training. Pranayama (controlled breathing exercise) improves the air way reactivity in the asthmatic individuals. It was noted that high frequency breathing exercise resulted in more than 10 fold increase in expired minute ventilation.⁷ Many reports supported the beneficial effect of longterm Yoga training on pulmonary functions.^{5,8} It has been reported that regular Yoga practice resulted in decrease in resting respiratory rate.⁹ It has also been reported that short term Yoga practice resulted in significant improvement in BHT^{10,11} and MVV.¹² In our study we have seen that The age was comparable 31.45 ± 3.98 and 32.45 ± 4.17 (t=0.78, df=49, p>0.05); The ratio of male to female was 1.50 : 1 and 1.30: 1 was also comparable (X²=0.34, df=1, p>0.05). FVC (L/min) was - 4.02±0.54 and 2.98±0.34 (P<0.001, t=5.58, df=48); FEV1 (L/min)- 3.84±0.17 and 2.82±0.27 (P<0.05, t=3.92, df=48); FEV1/FVC ratio (%) was 98.29±3.78 and 92.53±4.89 (P<0.001, t=11.98, df=48); FEF 25-75% (L/min) was 4.93±0.13 and 3.53±1.45 (P<0.01, t=4.52, df=48); PEFR (L/s) was 7.03±1.23 and 4.92±2.56 (P<0.005, t=6.79, df=48), SVC (L/min)- 3.84±0.25 and 1.78±0.38 (P<0.001, t=7.94, df=48); MVV (L/min) was 95.14±4.97 and 92.19±5.62 (P<0.001, t=12.76, df=48) Significantly higher in Yogic Group as Compared to Non Yogic Group volunteers. These findings are similar to Kuppaswamy *et al*¹³ they found A significant (P < 0.05) improvement in all pulmonary function parameters; FVC, FEV1, FEV1/FVC ratio, FEF 25%-75% and PEFR was seen in the Bhr.P group than the control group adolescents. Slow vital capacity (SVC) and Maximum Voluntary Volume (MVV) also showed significant improvement in the prāṇāyāma group.

CONCLUSION

It can be concluded from our study that the lung function by various parameters of LFT showed there is significant improvement of lung function.

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