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Management of Psycho-Physiological aspect of Bronchial Asthma through Yogic Intervention

SARITA PRAJAPATI, AMAL K. DUTTA and RAKESH VARMA

Abstract

In this study eighty bronchial asthma patients were selected through accidental sampling and sample was divided into experimental group (n=40) and control group (n=40). They underwent Yoga therapy program for 60 days with an integrated set of yogic practices, including *jihvamula, karnarandhra, kapalrandhra, tadasana, tiryaka tadasana, kati chakrasana* and *marjariasana , nadishodhan pranayama, bhastrika pranayama* and *Gayatri mantra.* Bronchial asthmatics practiced these exercises for 45 minutes daily for 60 days. Stress level and forced expiratory volume in one second (FEV1) were assessed on all the Bronchial asthmatics, both initially and after completion of study. The obtained data were statistically analyzed through paired t-test. Subjects of experimental group showed a statistically significant decreasing trend in average stress level and increasing trend in average forced expiratory volume in one second (FEV1) after 60 days Yoga practice, while control group showed no such improvement (P>0.01).

Key words: Yoga Intervention, Bronchial asthma, Stress and FEV1

Bronchial Asthma is a chronic inflammatory lung disease and psychosomatic discrepancy. It is associated often with psychological stress. 'Stress and strong emotions can make the condition of asthmatics worse and give patient an increased exposure to the development of anxiety disorders' (Rumbak, *et al.*, 1993). The autonomic nerves which innervate the bronchi and have cholinergic activity become overactive in Asthma which results in broncho constriction. The autonomic nerves which innervate the bronchi and have adrenergic activity become less active in Asthma which results in broncho dilation. Yoga and relaxation techniques can improve the respiration and change in lifestyle develops the stress coping ability in the Asthma patients.

Rajyoga texts state that if there is illness in the body senses or mind then it becomes a disease which leads to an obstacle *(yogantaraya)* or distraction *(viksheap) (Patanjal Yog Darsan* 1/30, 31). By sincere yogic practices, all obstacles can be remove. The obstacle called *vyadhi* is also a distraction of the mind-field. Along with the distraction of mind-field five impediments grief *(duhkha),* frustration *(daurmanasya),* unsteadiness of limbs *(angamejayatava),* inhalation and exhalation *(shvasha and prashvash)* are produced. In Asthma all these five impediments are clearly visible. The frustrations and discontent produced by the unfulfilled desires of asthmatics are their *daurmanasya*. The unsteadiness of the limbs of the body in an asthmatic is *angamejayatva.* The root cause of Asthma is disturbances in respiratory system. In Asthma inhalation and exhalation becomes irregular and uncontrolled. All the five impediments produced in Asthma show the distracted state of mind. By specific practices of Yoga as contemplation and enunciation of AUM mantra the distractions are overcome (*Patanjal Yog Darsan,* 1/29).

Hathayoga makes a firm body and healthy mind and this enables one to rectify all past evil deeds. The process of *Hathayoga* leads to the path of *Rajayoga (Hathpradipika, 4/103)* and the purpose of *Rajayoga* is to have control over mind-field *(Patanjal Yoga Darshan,* 1/2) and cleans the

entire being. When practice yoga in this way one is completely engulfed in positive elements and becomes dispassionate from opposite elements. By this one suffering from Asthma can get tuned into normal breathing again.

RESEARCH METHODS

Sample and Sampling

In the present study eighty bronchial asthma patients were selected through accidental sampling and this sample is divided into control and experimental groups.

Research design

Experimental and control group design was used for present study. Both experimental and control groups were taking the medicine (Asthalin, Theophylline, Salbutamol etc) for bronchial dilation as per the advice of the concerned physician.The intervention program of Yoga therapy was given to the 'experimental group' while 'control group' was not given any such treatment. The outcome measures were assessed in both groups before and after the intervention.

Intervention Schedule

Eighty bronchial asthma patients were selected through accidental sampling and this sample was divided into control and experimental groups. Level of Stress and FEV1 was measured before and after the study. Patients assigned to the experimental group underwent the selected yogic intervention and each day they performed yoga practices early in the morning for 45 minutes for 60 days.

Protocol of the selected Yoga therapy program

S.N.	Category	Duration	Category Detail	Name of practice
1.	*Kriyas* (Cleansing techniques)	5 minutes	*Dhauti*	*Jihvamula, Karnarandhra and Kapalrandhra practiced under Dantadhauti*
2	*Yogasanas* (Postures)	10 minutes	Standing group *(3 asanas)*	*Tadasana, Tiryaka tadasana and Kati chakrasana*
			Vajrasana group (1 asana)	*Marjariasana*
3	Breathing Practices	25 minutes	*pranayama*	*Nadishodhan and Bhastrika pranayama*
4	*Mantra*	5 minutes	*Mantra Yoga*	*Gayatri Mantra*

Each session ended with the *'Om'* chanting and three fold recitation of *'Shanti'*.

Procedure

This study was conducted at the Holistic Health Management Department, Dev Sanskriti Vishwavidyalaya, Haridwar. Eighty diagnosed bronchial asthma patients were selected through accidental sampling and sample was divided into experimental group (n=40) and control group (n=40). There were 18 females and 22 males in each group and their age range was 18 to 60 years. All patients followed their prescribed treatment during the course of study. The yogic intervention was given to the 'experimental group' while 'control group' was not given any such treatment. The outcome measures were assessed in both groups before and after the study.

Tools

Questionnaire as well as laboratory instruments were used for the assessment of Bronchial Asthma and Stress. Stress scale developed by Kaur, Puri,

Kumar and Mehta (2008) was used. Medspiror which is manufactured by Medicare Systems Chandigarh was used for the measurement of FEV1

Statistical analysis

Obtained data were tabulated and analyzed.The initial values on 0^{th} day of each parameter were compared with the final values obtained on 60^{th} day's measurement. Paired t-test was used for the statistical analysis.

RESULTS

Table (1): Comparison between experimental and control groups on the Stress level of patients with bronchial asthma before and after the study

Group	Test	N	M	SE_M	r	df	SE_D	Paired t- value	P- value
Experimental Group	Pre-test	40	55.50	1.99	0.95	39	0.61	11.59**	P< 0.01
	Post-test	40	48.45	1.99					
Control Group	Pre-test	40	55.30	1.77	0.92	39	0.67	0.45	P< 0.05
	Post-test	40	55.00	1.66					

The mean and standard error of mean ($M \pm SE_M$) of pre-test and post-test on stress level of the Asthma patients of the control group were consecutively found to be 55.30 ± 1.77 and 55.00 ± 1.66. The correlation (r) is 0.92 and standard error of deviation (SE_D) is 0.67 and obtained t-value is 0.45 which is statistically not significant at 0.05 significance level of confidence.

The mean and standard error of mean ($M \pm SE_M$) of stress level for asthmatic patients of the experimental group before and after the yogic practices were consecutively found to be 55.50 ± 1.99 and 48.45 ± 1.99**.** The correlation (r) is 0.95 and standard error of deviation (SE_D) is 0.61 and obtained t-value is 11.59 which is statistically significant at 0.01 significance level of confidence. On the bases of obtained result it can concluded that yogic intervention is significantly reduces the stress level of experimental group.

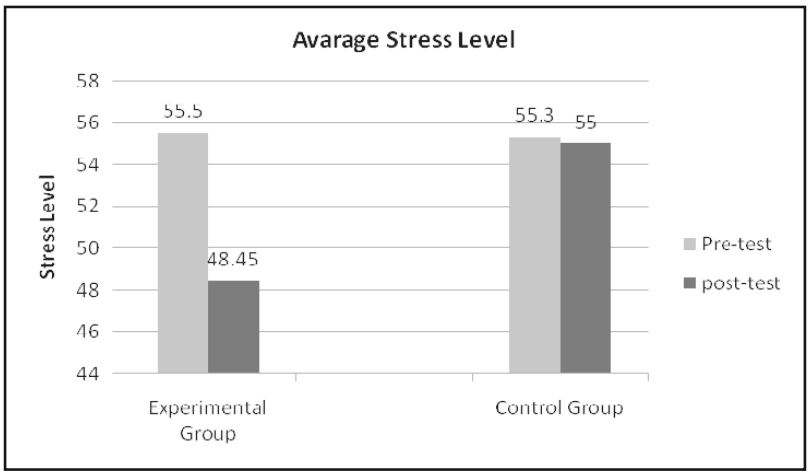


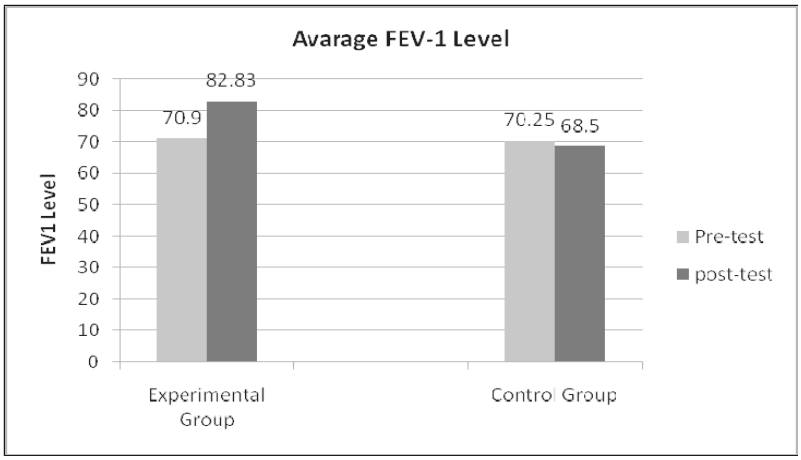
Table (2): Comparison between experimental and control groups on the FEV1 of patients with bronchial asthma before and after the study

Group	Test	N	M	SE_M	r	df	SE_D	Paired t-value	P- value
Experimental Group	Pre-test	40	70.90	2.46	0.80	39	1.71	6.99**	P< 0.01
	Post-test	40	82.83	2.85					
Control Group	Pre-test	40	70.25	1.83	0.91	39	0.76	2.31*	P< 0.05
	Post-test	40	68.50	1.64					

The mean and standard error of mean ($M \pm SE_M$) of average percentage of predicted FEV1 level of the Asthma patients of the experimental group before and after the yogic practices were consecutively found to be $70.90 \pm 2.46\%$ and $82.83 \pm 2.85\%$**.** The correlation (r) is 0.80 and standard error of deviation (SE_D) is 1.71 and obtained t-value is 6.99 which is statistically significant at 0.01 significance level of confidence. These results show that average % predicted FEV1 level in post-test group is significantly more than that in pre-test group due to the intervention of yogic therapy which implies that yogic intervention significantly increases the average % predicted FEV1 level in the experimental group.

The mean and standard error of mean ($M \pm SE_M$) of average percentage of predicted FEV1 level of the Asthma patients of the control group before and after the yogic practices were consecutively found to be $70.25 \pm 1.83\%$ and $68.50 \pm 1.64\%$. The correlation (r) is 0.91 and standard error of deviation (SE_D) is 0.76 and obtained t-value is 2.31 which is statistically significant at 0.05 significance level of confidence. It means that some extraneous factor seems to have influenced the average % predicted FEV1 level of control group subjects during the period of yogic intervention.

These observations conclude that the experimental group is highly influenced by Yoga therapy which creates the significant increase in average % predicted FEV1 level of experimental group in comparison to that of the control group of asthmatics.



From the results it is clear that the Yogic intervention brings significant favorable effects in the psycho-physiological parameters of bronchial asthmatic patients.

DISCUSSION

This study is an effort to inspect the role of selected yogic practices on stress level and forced expiratory volume in one second (FEV1) of the Bronchial asthmatics. Yellowlees, (1988) said that the Asthma and psychological factors are correlated. Mental and physical contaminations are present in every type and each age group of Asthma patients which affects their family and social life. Yogic practices show positive effect on both body and mind of Asthmatics. Barnes, (2008) demonstrated that Asthma is associated with increase in airway resistance, decrease in forced respiration volumes, flow rates, hyperinflation of the lungs and increase in the work of breathing.

Selected yogic practices play the vital role on psychological and physiological facets of bronchial asthmatics. In this study, *shatkarma, asanas, pranayamas* and *mantra* are the four limbs of the selected yogic practices. Here researchers have selected the three specific cleansing techniques *the jihvamula, karnarandhra and kapalrandhra* which comes under *dantadhauti.* Asthma triggers activate the nerve endings in the airways and cause cough, chest tightness and broncho construction. Selected *dantadhauties do* the cleansing of inner tracts and desensitize the nerve endings and also remove secretion from airways of respiratory tract. Singh (1987) reported that '*Kunjal* is a nonspecific protective factor in management of bronchial asthma that is why the researcher has taken the *jihvamula* because the *jihvamula* is only the initiation of *kunjal.* The process of *jihvamula* and *karnarandhra* are very simple and effective. It cleans the airways which regulate and control the speaking and hearing. Through the *kapalrandhra dhautikarma* problems of cough are eliminated the nerves of brain are purified (*Gherand Samhita* 1/33, 34). Thus the mental and physical discomforts produced in Asthma patients are eradicated.

In this study, *tadasana, triyaktadasana, katichakrasana and marjariasana* come under the second limb (asana) of the selected yogic practices. *Tadasana and triyaktadasana help in physical and mental balance. Katichakrasana* is helpful for correcting postural problems and spinal stiffness. *Marjariasana* increases the flexibility of neck, shoulders, and spinal cord (Saraswati, 2002). These asana gives positive stimulus to sensory, motor nerve of spinal cord and excels the flow of *pranic* circuit. The effect of *marjariasana* on body is relaxing, as it enhances the air flow rate of lungs and asthma patients get relaxed.

Nadishodhan and *bhastrika pranayama* come under the third limb (*pranayama)* of the selected yogic practices for Asthma management. For Asthma patient practice of *nadishodhan* and *bhastrika pranayama* is the key to achieve good health. According to *Hathpradipika* (2/16) through proper practice of *nadishodhan* all diseases are removed. Practice of *nadishodhan* eliminates all ailments of *nadis* and treats respiratory problem of asthmatic patients. Fluge, *et al.*, (1994) found that the breathing exercises induced a significant improvement of lung function parameters of Bronchial Asthma patients. Singh, *et al.*, (2000) suggest that flowing air exerts frictional stress on the walls of the pipe. Activities such as *Yoga 'pranayama'*, breathing a helium-oxygen mixture and nasal continuous positive airway pressure that reduce frictional stress are beneficial; control of cough may have anti-inflammatory benefits in patients with Asthma.

In this study, *Gayatri mantra* is the fourth limb of the selected yogic practices and it is a divine prayer which means that, 'may almighty illuminate our intellect and inspire us towards the righteous path'. The recitation of *Gayatri mantra* is traditionally preceded by *Om. Om* is the ultimate name of God and through practice of

omkara absence of illness and other distraction occurs and man gets the knowledge of his actual strength *(Patanjal Yoga Darshan,* 1/27, 29). Pradhan and Derle (2012) found that chanting of *Gayatri mantra* significantly improve attention. A study of the therapeutic benefit of *Gayatri mantra* proved its utility in psychological disorders (Sharma, 1994). Asthma has been associated with psychological stress (Rumbak, *et al.*, 1993). Regular practice of *Gayatri mantra* chanting may increase self awareness, mental peace and reduces stress of asthmatics. Several studies showed the impact of yogic practices in lowering the level of stress which is helpful in the management of Asthma. A study showed the reduction in perceived stress and cortisol levels by practicing *hathayoga* (West, *et al*., 2004). A randomized study investigated that Yoga breathing and breathing exercises developed better coping with stress and lung function and improved the mental state of wellbeing of Asthma patients (Steurer-Steya, *et al*., 2002). *Sudarshan kriya* and related yogic practices release stress (Kjellgren, *et al*., 2001).The finding of a study suggest that Yoga programme act as a promising stress management technique (Granath, *et al*., 2006). The above mentioned studies also support the present study.

The low FEV1 indicate the presence of obstructive lung diseases. In Asthma this obstruction is reversible after the administration of bronchodilator. Study reported that the integral treatment of diet therapy, nature cure treatment and Yoga therapy can significantly improve the FEV1 of the Asthma patients (Sathyaprabha, *et al.,* 2001). In another research Joshi, *et al.,* (1992) found significant rise in FEV1 of female subjects after *pranayama* practice. The above mentioned studies also support the present study.

Conclusion

Yoga practices affect physical and mental facets of asthmatics life. Yoga therapy basically restores the depleted and blocked *pranic* energy which led to positive changes in patients with bronchial asthma. Integral effects selected yogic practices lead to significant reduction in the average stress level and significant increase in the average FEV1level of pulmonary function of bronchial asthmatics. Based on the finding of this study it can concluded that Yogic intervention is effective tool for the management of bronchial asthma.

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Cough dosham nivaryat **(Gherand Samhita, 1/33)** ॥

Prāṇāyāmena yuktena sarva-roga-kṣayo bhavet **(Hatha Pradipika, 2/16)** ॥

Duḥkhadaurmanasyāṅgamejayatvaśvāsapraśvāsā vikṣepasahabhuvaḥ **(Patanjal Yoga Darshan, 1/ 31)** ॥

Sarve hathelayopāyā rājayogasya siddhaye **(Hatha Pradipika, 4/103)** ॥

śuddham eti yadā sarvaṁ nāḍī-cakraṁ malākulam / tada-iva jāyate yogī prāṇa-saṁgrahaṇe kṣamaḥ **(Hatha Pradipika, 2/5)**

Pracchardanavidhāraṇābhyāṁ vā prāṇasya **(Patanjal Yoga Darshan, 1/34)** ॥

Tasya vācakaḥ praṇavaḥ **(Patanjal Yoga Darshan, 1/ 27)** ॥

Tataḥ ratyakcetanādhigamo'pyantarāyābhāvaśca **(Patanjal Yoga Darshan, 1/ 29)** ॥

Vyādhistyānasaṁśayapramādālasyāviratibhrāntidarśanālabdha bhūmikatvānavasthitatvāni cittavikṣepāste'ntarāyāḥ **(Patanjal Yoga Darshan, 1/30)** ॥

Yogaścittavrttinirodhaḥ **(Patanjal Yoga Darshan, 1/2)** ॥

Nādi nirmalatām yāti **(Gherand Samhita, 1/ 34)** ॥