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Effect of Yoga on bronchial asthma

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***Abstract*---**Introduction-Asthma is a disease affecting the lungs causing airway obstruction, dyspnoea and cough with restlessness. Patients use multiple medications to control their symptoms but still, they are not relieved. Yoga has been used as a complementary therapy but many people fail to use it because of difficulty in performing it. This study was done with the aim to use four simple yoga exercises to find if any reduction in symptoms and benefits to the patients. Material & Method- 80 asthmatic patients were selected and placed randomly into two groups, the Case Group and Control group, with 40 subjects in each. The baseline Pulmonary Function Tests(PFT) parameters like Forced Expiratory Volume in 1 second(FEV1), Forced Vital Capacity(FVC), FEV1/FVC and Peak Expiratory Flow Rate(PEFR) are measured in both the groups. Also, the Absolute Eosinophil Count(AEC) was measured in all participants. The number of patients suffering from acute exacerbation was counted and noted in each group. Then the Case Group participants were asked to perform Yoga for 4 months under the supervision of a Yoga Instructor. The Control Group was asked to take medicine as before and report after 4 months. After 4 months PFT, AEC and acute exacerbation of asthma was noted and compared between the two groups. Result- Case group showed significant improvement in PFT and AEC findings. FEV1, FVC, FEV1/FVC and PEFR were increased significantly in the Case Group in comparison to the Control Group. Significant reduction of AEC in Case Group showed a decrease in allergy in Case Group than Control. The number of subjects with acute exacerbation was also significantly reduced in the Case Group. Conclusion- Regular practicing simple

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Yoga can definitely have a beneficial effect on the patients with bronchial asthma along with reducing their symptoms and medicine use.

***Keywords*---**bronchial asthma, Yoga, pulmonary function test, absolute eosinophil count, acute exacerbation.

Introduction

Asthma is a chronic inflammatory condition of the respiratory tree where many cells and cellular elements participate. Its exacerbation can be acute or chronic. in both conditions, the problem is airway obstruction. Even though the obstruction is episodic, the inflammation is persistent[1]. The main cause of symptoms is mediators released by activated mast cells, eosinophils and T-Lymphocytes. The inflammatory response produced due to these mediators leads to airway hyperresponsiveness that is related to the severity of the disease and may result in an irreversible narrowing of airways[2].Treatments for asthma are long-acting B2 agonists, inhaled corticosteroids, oral steroids, leukotriene modifiers and IgE blockers. The majority of patients on treatment are still symptomatic and have a poor quality of life[3].

Apart from drugs, various alternative therapies are used to treat bronchial asthma. Yoga is used to control asthma in many places. A study by Vedantan et al showed that there is decreased use of adrenergic inhalers in the case of asthmatics practicing pranayama. Most of the researchers who had worked on such topics had used many types of yogic exercises and pranayama. Though those exercises had given results they were difficult to perform. For example, the work by Saurabh K and Shilpi K showed that 5 types of Pranayamas and 23 types of asanas with 4 types of shuddhi yoga to practice for yoga[4]. Another work by Arpan A B, et al. showed improvement in lung function but they have also used 6 asanas and 7 pranayamas for 16 weeks in 32 patients[5]. Considering the above facts we have tried to show how the habit of practicing 3 simple asanas and pranayamas each for half an hour daily for 5 days a week for 4 months showed improvement in pulmonary functions and blood parameters (Absolute Eosinophilic Count) with a reduction of drug use and acute exacerbation. The aim of this study was to show how persistent use of simple yoga exercises can control bronchial asthma.

Material and Methods

The following study was done in the Department of Physiology after taking permission from Institutional Ethical Committee (IEC/IRB No- 129/2010). The duration of the study was 4 months and 80 subjects were enrolled the study. All the subjects were males between the age of 26-34 years. They were allocated into two groups of cases and controls with the following inclusion and exclusion criteria:

Inclusion criteria

- Bronchial asthma cases were sent to us from the Department of Pulmonary Medicine.
- They have symptoms for a long duration.
- They were on bronchodilators and other medication.

Exclusion criteria

- Smoker
- Suffering from Obstructive or Restrictive Lung Diseases.
- Patients with other illnesses.
- Patients with heart diseases.

In both the groups, the subjects were asthmatic and are under medication. The participants of the case group were exposed to yoga therapy and the control group subjects continued their medication only. A trained yoga instructor was appointed for the purpose with specific instruction to use a minimum number of asanas and pranayama for the purpose which will be very easy to the subjects under study. The subjects in case groups underwent yoga for 4 months. Each participant was followed up after 4 months for the following parameters:

- Pulmonary Function Tests (PFT)- FEV1, FVC, FEV1/FVC and PEFR.
- Number of exacerbations 4 months prior and 4 months after the intervention.
- Absolute eosinophilic count (AEC) was used to find the change in allergy status.
- Change in medication status – bronchodilators and corticosteroids.

These parameters were both recorded at beginning of the study and after 4 months of intervention.

- FEV1, FVC, FEV1/FVC and PEFR (Pulmonary function test was done using Spirolab-ll spirometer.
- Exacerbation of asthma meant any marked increase in symptoms and reduction in lung function that interfere with the ability to perform daily usual activities unless quick relief therapy is given[6]. It includes a questionnaire where the subject has to answer about various problems related to asthma-like episodes of cough at different times of day, night awakening due to cough or asthma symptoms, etc.
- Absolute Eosinophilic Count was estimated by Direct method using Pilot's Fluid, WBC pipette and Neubauer's chamber.

The subjects in the case group were subjected to Yoga. The yoga instructor was called for 5 days a week for 4 months and taught the subjects asanas and pranayamas. Asanas include Tadasana, Tiryaka Tadasana and Kati Chakrasana. Each asana was done 10 times a cycle for 3 cycles in the first month, increased to 4 and 5 cycles in the second and third months respectively. Pranayama done were bhastrika pranayama. At the end of each class, Shavasana was done for 10 min.

In the control group, all the subjects were asked to continue their medication which was given at the beginning. No other intervention was assigned. They were kept in touch by weekly telephone calls and reminders to visit after 4 months. Statistical analysis done was Paired t-test, unpaired t-test, the Mc Nemar test and Wilcoxon Signed Rank Test. A p-value of 0.05 or less was taken as statistical significance. The statistical analysis was done with the help of SPSS 16.0 software.

Result

In this study, 80 asthmatic subjects on medication were enrolled. They were divided equally into the Case group and the Control group. The baseline parameters were taken and the subjects of the Case group were asked to practice Yoga under the supervision of Yoga instructor for 4 months. After four months, the PFT, Exacerbation, Absolute Eosinophilic Count were compared with baseline.

Table 1
Shows the baseline demographic characteristics (by Unpaired t-test)

	Case	Control	p value
Age(in Years)	29.36±3.12	30.18±2.91	.228
Height(in cms)	158.33±7.43	160.21±9.61	.331
Weight (in Kg)	59.34 ± 5.73	61.27 ± 6.81	.174
Body Mass Index(in Kg/m^2)	24.74±4.28	25.31±4.84	.578

Table 2
Shows the comparison between the duration of asthma, PFT parameters and the AEC of the Case and Control group at the beginning of the study (by Unpaired t-test)

	Case Group(n=37)	Control Group (n=34)	p value
Duration of Asthma	10.35±2.8	10.21±2.4	.819
FEV1(L)	2.36±0.78	2.47±0.8	.535
FVC(L)	3.97±0.73	4.14±0.58	.252
FEV1/FVC(%)	68.37±19.22	66.48±22.15	.685
PEFR(ml/min)	273.38±61.63	256±72.86	.253
AEC	364±111.74	371±89.9	.758

Table 3
Shows the comparison between PFT parameters and the AEC of the Case and Control group after 4 months of the study(by Unpaired t-test)

	Case Group(n=37)	Control Group (n=34)	p value
FEV1(L)	3.13±0.13	2.84±0.45	.0002
FVC(L)	4.16±0.15	4.28± 0.39	.073
FEV1/FVC(%)	76.67±8.09	63.39±10.66	.0001
PEFR(ml/min)	348.38±39.53	279.71±47.2	.0001
AEC	301.93 ± 81.74	342.61±92.87	.041

Table 4
Shows the comparison of a number of subjects who had acute exacerbations before and after 4 months of intervention in the case and control groups (by using McNemar's test)

Group	Timeline	Acute exacerbations		p
		Yes	No	
Case Group	At beginning of study	36	4	.045
	After 4 months	12	28	
Control Group	At beginning of study	27	13	0.369
	After 4 months	18	22	

Table 5
Shows a comparison of subjects' PFT parameters and the AEC in the Case Group both before and after the study

	Case Group at beginning of study	Case Group after 4 months	p value
FEV1(L)	2.36±0.78	3.13±0.13	.0001
FVC(L)	3.97±0.73	4.16±0.15	.111
FEV1/FVC(%)	68.37±19.22	76.67±8.09	.014
PEFR(ml/min)	273.38±61.63	348.38±39.53	.0001
AEC	364±111.74	301.93 ± 81.74	.006

Table 6
Shows a comparison of subjects' PFT parameters and the AEC in the Control Group both before and after the study

	Control Group at beginning of study	Control Group after 4 months	p value
FEV1(L)	2.47±0.8	2.84±0.45	.013
FVC(L)	4.14±0.58	4.28± 0.39	.209
FEV1/FVC(%)	66.48±22.15	63.39±10.66	.429
PEFR(ml/min)	256±72.86	279.71±47.2	.088

AEC	371±89.9	342.61±92.87	.169

Discussion

This study was done on 80 patients with bronchial asthma to show the beneficial effect of alternative therapy like Yoga. Our study showed practicing simple Yogic exercises for some time daily could bring a lot of improvement in asthmatic patients. People waste a lot of money on drugs to get relieved from the acute exacerbations that make their life miserable, still, they did not find complete relief. Yoga tries to bring a balance between the two components of the Autonomic Nervous System[7]. Irregular vagal discharge causing bronchoconstrictions is neutralized by the prolonged practice of such techniques as Bhastrika Pranayam which brings about sympathetic stimulation[8]. Studies by some researchers like Nagarathna et al have shown that the immune status of patients improved after practicing regular yoga as it brings down emotional stress and psychological problems[9].

At the beginning of the study, all the subjects were divided into Case and Control groups randomly after they have passed the inclusion and exclusion criteria. Then they were compared for age, height, weight and BMI and found that there was no significant change between the participants of both the groups(Table 1). They match all the parameters. Then the comparison of Pulmonary Function Tests(PFT) and Absolute Eosinophic Count (AEC) was done between both the groups. We found that in comparison, both the groups have similar PFT and AEC findings with no significant change(Table 2). Also, we collected the data about the number of participants who were having acute exacerbations in both groups. The Case Group was then asked to practice Yoga with three simple asanas and one pranayama under the supervision of a Yoga instructor for 4 months and continue using the medicine. The control groups were asked to continue their medicines for 4 months and return.

After 4 months of study, we found that PFT parameters in the Case group improved significantly in the Control Group(Table 3). Similar findings were shown by Murthy et al and Joshi et al[10,11]. AEC in Case Group was significantly reduced in comparison to Control Group. Similar findings were also shown by Sathyaprabha TN et al[12]. We also found that acute exacerbation was significantly reduced in the Case Group than in the Control Group (Table 4). The reduction in the number of subjects showing acute exacerbation in the Case Group from the second month onwards gave us an idea that Yoga definitely had some beneficial role in the patients. Their frequency of using medicines became less. Our study matched with the study by Nagarathna et al[9]. The selection of the subjects was completely random, so we think that we could have definitely gotten the same result if we would have taken any patients. The subjects of the Case Group showed significant change in PFT, AEC and rate of exacerbation after practicing yoga for 4 months(Table 5) while subjects of the Control group showed significant change in FEV1 only but the rest of the other parameters did not show any significant changes(Table 6). Research work on more subjects is required with other Yogic postures to find more results.

Conclusion

We found that performing simple Yoga exercises regularly with proper training will definitely control the symptoms in asthmatics. It will not only reduces the rate of exacerbation but also provide financial help to the subjects by reducing their medicines. Thus patients with bronchial asthma should regularly practice simple yoga to lead a happy and symptom- free life.

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Conflict of interest- None

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