

Original Research Article

Effect of anulom vilom pranayama as an adjuvant treatment modality to improve the level of dyspnea in chronic asthma patients

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ABSTRACT

Background: Dyspnea is the main symptom suffered by bronchial asthma patients who are even under medical treatment. This study was aimed to evaluate the use of alternate nostril breathing as an adjuvant treatment modality to improve the level of dyspnea in patients with bronchial asthma.

Methods: Patients who were diagnosed to have bronchial asthma for more than 6 months with the modified Borg dyspnea score of more than 3 and forced expiratory volume (FEV1) for one second less than 80% included in the study. Anulom Vilom Pranayama was instructed to practice daily for 10 minutes for 4 weeks. The level of dyspnea in pre and post test was conducted using modified Borg dyspnea scale after doing six minute walk. Spirometer was used to assess the FEV1. The data was analysed statistically.

Results: Twenty patients were included in the study. Majority belonged to the age group of 20-29 with female dominance and no history of smoking. There was a significant ($p = 0.0001$) reduction in dyspnea after practicing Anulom Vilom Pranayama for one month. The median of Borg dyspnea scale in the pre-test was 4.5 and that of post-test was 3.5. The mean FEV1 score in the pre-test was 57.20 and that of post-test was 68.75 which was found to be statistically significant ($p=0.0001$).

Conclusions: One-month anulom vilom pranayama daily for 10 minutes improved the Borg dyspnea scale and FEV1 score. This indicates it as an effective intervention in reducing the level of dyspnea in chronic bronchial asthma patients.

Keywords: Asthma, Borg dyspnea score, Dyspnea, Forced expiratory volume, Pranayama

INTRODUCTION

Asthma is due to the inflammation of the air passages in the lungs and affects the sensitivity of the nerve endings in the airways. It can attack all age groups, but often starts in the childhood. The disease is characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person.¹ About 300 million people worldwide suffer from asthma and are expected to rise to 400 million by year 2025. Asthma epidemiology study group of the Indian Council

of Medical Research found the prevalence of bronchial asthma in Indian adults to be 2.38% which remains a high overall national burden of disease.²⁻⁴

The proper cure for asthma is not yet found out. Presently anti-inflammatory and bronchodilator treatments, concurrent with other drugs such as anti-leucotrienes, are effective for most of the asthma patients. Despite the therapeutic options available, many asthmatic patients with moderate-to-severe persistent asthma continue to experience symptoms. Dyspnea is the main symptom

suffered by asthma patients who are even under medical treatment. Patients with severe persistent asthma who are inadequately controlled despite the global Initiative for asthma (GINA) step IV therapy, are a challenging population with significant unmet medical need. Healthy lifestyles and breathing exercises help in the improvement of quality of life. Breathing exercises includes an alternate nostril breathing (ANB) which consists of slow, deep and quiet breaths using one nostril at a time. The beneficial effect of such exercise may vary with population, duration and severity of dyspnea. Hence, this study was aimed to evaluate the effect of one-month ANB as an adjuvant treatment modality to improve cardio-respiratory parameters in patients with dyspnea.

METHODS

Study design

The prospective study was done in the outpatient department of Pulmonology, during the period of 2016-17. Patients who were diagnosed to have bronchial asthma for more than 6 months with the modified Borg dyspnea score of more than 3 plus forced expiratory volume (FEV1) for one second less than 80%, patients who were available at the time of study and cooperative were included in the study. Bronchial asthma patients who were bed ridden, patients with history of myocardial infarction and unstable angina within 3 months or SPO2 less than 93% were excluded from the study. The purpose of the study was explained, and written consent was obtained from them. The study was conducted after the approval from the Institutional ethical committee.

Procedure

Based on consultation, the subjects were allocated into experimental group. Demographic data of patients such as age, gender, religion, educational status, occupation, place of residence, duration of illness, previous history of hospitalization and history of smoking were collected using questionnaire. Anulom Vilom Pranayama was taught by the investigator. The patient was asked to sit straight, closed the right nostril with the right thumb and inhaled slowly through the left nostril for 2 seconds. After this, closed the left nostril with the ring finger, removed the thumb from the right nostril and exhaled for 4 seconds. Again, inhaled through the right nostril and repeated the procedure. The practice was done twice daily for 5 minute each. They were instructed to practice it daily for 10 minutes for 4 weeks. Investigator maintained phone contact and instructed them to maintain a diary regarding the practicing time. The patients were returned after the 4th week to the pulmonology outpatient department for review. Pre and post-test were conducted using modified Borg dyspnea scale. The modified Borg dyspnea scale is a rating scale ranging from 0 (none) to 10 (severe) on which patients are asked to rate their level of dyspnea after doing six-minute walk test.⁵ Spirometer was used to assess FEV1 in first second.

Statistical analysis

The data was statistically analysed using SPSS (v16, USA) software. The level of dyspnea and selected demographic variables were assessed using Fisher’s exact test. Effect of Anulom Vilom Pranayama on level of dyspnea was assessed using paired t test and Wilcoxon signed rank test. P<0.05 was considered as significant.

RESULTS

Table 1 depicts the distribution of asthma patients according to age. The 25% of the patients were 20-29 years of age and age more than 60 were 25%. No statistically significant difference could find among the groups (Fisher’s exact test, p= 0.346).

Table 1: Frequency and percentage distribution of asthma patients according to age.

Age	Frequency (%)
20-29	5 (25)
30-39	4 (20)
40-49	2 (10)
50-59	4 (20)
>60	5 (25)

Regarding the gender, most of the sample in belongs to female gender (75%) (Figure 1). All of the patients were literate with no occupation. Considering place of residence majority of the patients (80%) were residing in rural area with no history of smoking.

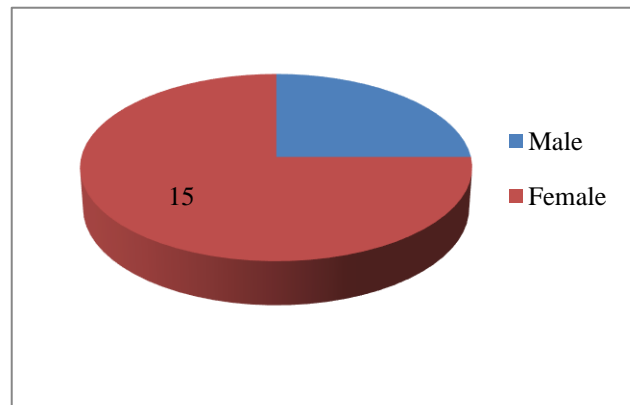


Figure 1: Distribution of dyspnea patients based on gender.

Figure 2 depicted the frequency and percentage distribution of asthma patients according to modified Borg dyspnea scale. It reveals that majority of the patients (30%) had dyspnea rate 4. Figure 3 depicted the distribution of asthma patients according to FEV1 score (Table 2). Thirty percent of the patients had severe dyspnea. There was a significant (Wilcoxon signed rank test p = 0.0001) reduction in dyspnea after practicing Anulom Vilom Pranayama (Table 3). The mean of Borg dyspnea scale in the pretest was 4.5 and that of post test

was 3.50. The FEV1 score in the pretest was 57.20 and that of post test was 68.75 which was found to be statistically significant ($p=0.0001$) (Table 4).

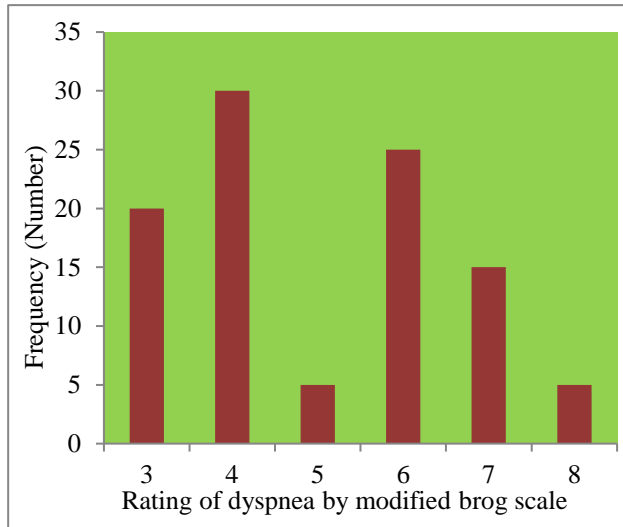


Figure 2: Distribution of dyspnea patients based on modified Borg dyspnea scale.

Table 2: Distribution of asthma patients according to pretest score of FEV1 score.

FEV1	Frequency (%)
Very severe	1 (5)
Severe	6 (30)
Moderately severe	5 (25)
Moderate	3 (15)
Mild	5 (25)

Table 3: Pre and post test scores of levels of dyspnea.

Modified borg dyspnea scale		Z score	P value
	Median		
Pre-test	4.5	3.75	0.0001
Post test	3.5		

Table 4: Pre and post test scores of levels of dyspnea using FEV1 score.

FEV1 score	T value	P value
Pre-test	57.20 ± 14.65	5.077
Post test	68.75 ± 19.63	

DISCUSSION

Anulom vilom pranayama was a successful method in reduction of level of dyspnea among the asthma patients. The statistical analysis reveals that after one month Anulom Vilom Pranayama the level of dyspnea was effectively reduced. This was evidenced from both the pre and post modified Borg dyspnea scale and FEV1 score. The finding was consistent with previous research reports. However, the result obtained from a study

conducted in Uttar Pradesh among 50 bronchial asthma patients with yoga and 50 control asthma patients found no improvement in FEV1 values after one month of yoga practice. But a statistically significant result was observed after two months of yoga practice.⁶ Laviertes et al concluded that the self-report of dyspnea and spirometry obtained simultaneously provide complementary information for the routine assessment of stable asthmatic patients.⁷ Hence in this study, patients with Borg score 3 with FEV1 of 57.2 (pre-test) were selected.

ANB exercise affects brain hemisphere by alternately stimulating the right brain and then the left brain. This process brought about by the action of the air flowing through the nostrils that stimulates the contra-lateral (opposite) side of the brain. It can alter the cardio-respiratory and autonomic parameters.⁸ Anuloma-Viloma and Bhramari Pranayama technique for 20 minutes duration for 3 months increased the parasympathetic dominance in basal heart rate and caused fall of both systolic as well as diastolic blood pressure by the reduction in sympathetic impulse on the cardiovascular system.⁹ Furthermore, pranayama practice there was a significant reduction in anxiety and depression.¹⁰

The study identified that there is association between level of dyspnea using modified Borg dyspnea score and history of hospitalization whereas the other variables like age, occupation, place of residence, duration of illness and history of smoking has no association. The findings of the study were supported by a study Jennifer and Kathy in which they found an increased burden of dyspnea in hospitalized patients.¹¹

CONCLUSION

One-month anulom vilom pranayama was found to be an effective intervention in reducing the level of dyspnea. Small sample size and short duration of exercise were the main limitations of this study. Hence, a multicenter study in various population with increase period of anulom vilom pranayama is warranted.

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Ethical approval: The study was approved by the institutional ethics committee

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