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Effect of Buteyko Breathing Technique with Pranayama Breathing Techniques to Reduce the Symptoms in Asthmatic Patients

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Abstract: ***Asthma is defined as a chronic airway inflammation leading to narrowing of the small airways in the lungs. It is characterized by recurrent attacks of Breathlessness, wheezing, chest tightness and cough particularly at airway hyper responsiveness to a variety of stimuli resulting in inflammation of the bronchial wall and increased mucus secretion. BBT includes advice and training on the benefits of nasal breathing over oral breathing. Pranayama type of breathing results in reduction of symptoms less beta - adrenergic use and reduce airway hyper reactivity. Methodology: An experimental study is done to reduce the symptoms in asthma patients.20 asthma patients were selected and they were allotted into two groups by simple random sampling method as asthma patients in each group. Inclusion criteria both male and female age between 12 to 50. Exclusion criteria is severe asthmatics. Result: On comparing pre - test and post - test value within group A and group B and post test value between the group B shows marked improvement in 6 MWT and ACQ - 6. T Test shows highly significant difference in mean value P< 0.05. Conclusion: The result of the study shows that there is an effective reduction of symptoms and improvement in the quality of life by following buteyko breathing technique with pranayama technique.***

Keywords: Breathing technique, Buteyko breathing exercise, Pranayama breathing exercise.

1. Introduction

Asthma is defined as a chronic airway inflammation leading to narrowing of the small airways in the lungs. It is characterized by recurrent attacks of Breathlessness wheezing, chest tightness and cough particularly at airway hyper responsiveness to a variety of stimuli resulting in inflammation of the bronchial wall and increased mucus secretion thereby causing broncho constriction and airflow limitation. [1] different kinds of individuals react differently to various triggering factors [2] According to World Health Organization (WHO) it has been estimated that the prevalence of asthma in India is about 3% (30 million patients), with a prevalence of 2.4% in adults aged >15 years and between 4% and 20% in children

Asthma has multiple causes: Allergic - due to allergens include things like molds, house dust mites in bedding, carpets and stuffed furniture, pollution, pollens, pet dander, tobacco smoke, chemical irritants in the work place. Non allergic: due to respiratory illness, exercise - induced, stress, and weather may cause a flare. During the normal breathing, muscles around the airways are relaxed, letting air more easily and quietly. During an asthma attack, three things occur Bronchospasm: The muscles around the airways constrict (tighten) as shown in **Figure 1.** It makes your airway narrow. Air cannot flow freely through constricted airway. Inflammation: The lining of airways becomes swollen don't let us much air in or out of lungs. Mucus Production: During the attack, the body creates more mucus. Asthma is a complex condition where interaction of genetics and environment occurs involving many inflammatory cells which release a wide range of variety of mediators. These mediators act on the cells of the airway leading to smooth muscle contraction, hyper secretion, plasma leakage, edema activation of cholinergic reflexes and activation of sensory nerves, which lead to amplification of the continuing inflammatory response (**Figure 2).** The chronic inflammation leads to structural changes, including sub epithelial fibrosis and smooth muscle hypertrophy and hyperplasia this late process is less easily reversed than the acute changes and might end up with airway remodeling. Intermittent asthma occurs when one has symptoms less than two days a week and night time awakenings. Less than two times a month.

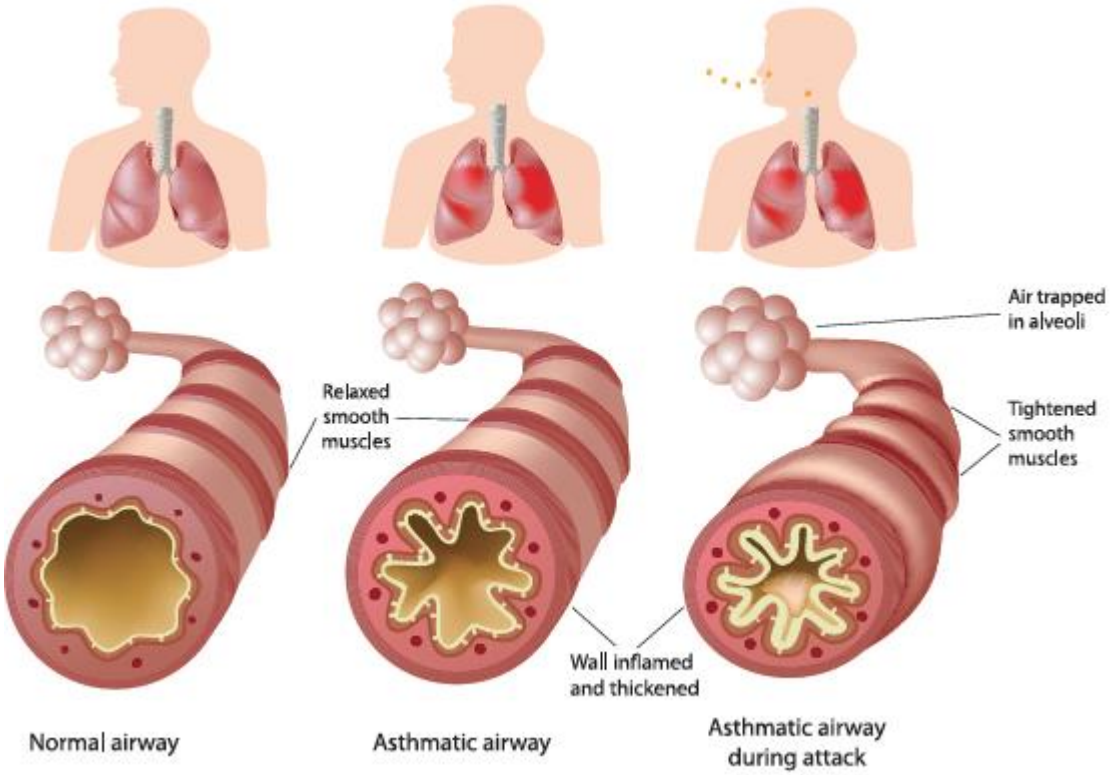

Figure 1: Pathology of Asthma

Mild asthma consists of having episodes more than two days a week (but not daily) while there are night time awakenings three to four times a month. Moderate asthma is were the symptomatic daily and the night times awakenings greater than once a week but not nightly. Severe asthma is the symptomatic throughout the day and often has night time awakenings more than seven times within a week. It is a complex and multifaceted condition causing significant impairment of physical and psychosocial well - being in the affected individual. Thus improving the health related quality of life of patients is one of the primary goals in asthma treatment although, the disease is not curable, appropriate management can control it's symptoms and allow patients to live their comfortably [2] mainstay of therapy includes steroids and bronchodilators categories for asthma management are divided into controller medication (inhaled corticosteroids) reliever medication low dose is (formoterol), and add on therapies with severe asthma (high dose of inhaled corticosteroids and long acting beta agonist [1] pulmonary rehabilitation has shown significant improvement in asthma control however, evidence shows that rehabilitation improves the quality of life and functional exercise capacity breathing techniques have been reported as the most frequently used methods among non - pharmacological approaches to asthma and hyperventilation. The Buteyko breathing technique and pranayama type of breathing aims to reduce hyperventilation less beta adrenergic used and reduce airway hyper reactivity. Breathing exercise have been incorporated into various therapies for asthma and hyperventilation

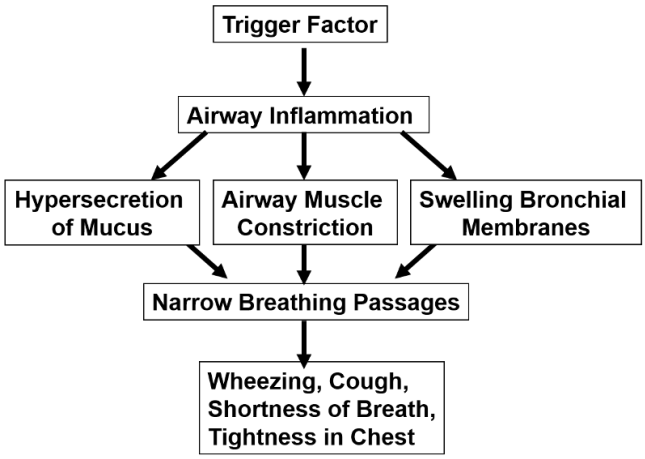

Figure 2: Steps of occurrence of Asthma

The Buteyko breathing technique and pranayama type of breathing aims to reduce hyperventilation less beta adrenergic used and reduce airway hyper reactivity. The major component of the Buteyko package is breathing therapy. The breathing component aims to reduce the hyperventilation through periods of controlled reduction in breathing known as `slow breathing 'and `reduced breathing 'combined with periods of breath holding. Known as `control pause 'and ` extended pause '. In Buteyko they are sometimes accompanied by physical activities to increase the buildup of co2 classical Buteyko theory would suggest that there is a direct relationship between the length of the `control pause 'and co2 levels. Pranayama as an art of prolongation and control of breath, which helps to bring the conscious awareness in breathing to reshape Breathing habits and patterns [5] slow breathing increases cardiac vagal baroreflex sensitivity improves oxygen saturation, lowers BP intensified vagal activity and reduces anxiety pranayama type of breathing results in reduction of

symptoms less beta - adrenergic use and reduce airway hyper reactivity as shown in **Figure 3**. Pranayama improves cardio vascular health. It can also improve flow to the heart. Decline the pulse and improves blood pressure. All the physical and mental advantage of pranayama in the end light up the outer worldly part of your life.

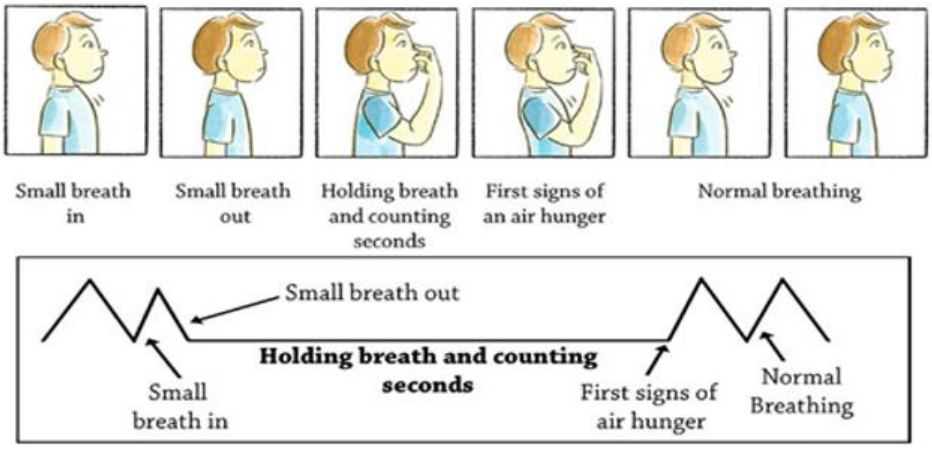

Figure 3: Buteyko breathing technique

Objective of the Study

The main aim of this study to assess the effect of Buteyko breathing technique with pranayama breathing technique to reduce the symptoms in asthmatic patients.

Procedure

Based on the selection criteria 20 asthma patients are selected. They were assigned into 2 groups by simple random sampling method. As 10 patients in each group. All 20 subjects were involved for pretest assessment which include asthma symptoms, quality of life and medications.

- Group A - Subjects received only Buteyko breathing technique the 8 - week treatment program was given as 5 days / week, two sessions per day and 20 minutes per session. The aim of the Buteyko method was to correct the patients breathing pattern by reducing hyperventilation and thereby resulting co2 levels. This technique involves periods of breath holding known as `control pause interspersed with periods of shallow breathing.
- Group B – Subjects received Buteyko breathing technique with pranayama breathing techniques. This 8 - week treatment program was given as 5 days/week, two sessions per day and 20 minutes per session Buteyko breathing technique given for 3 days followed by 2 days pranayama breathing technique.

Buteyko Breathing Method

Preparation	The Control Pause (7 Minutes)	The Maximum Pause (7 Minutes)
• Sit on the floor or on a chair. • Elongate your spine to maintain an upright posture. • Relax your respiration muscles. • Breathe normally for a few minutes (4 - 5 minutes).	• After a relaxed exhale, hold your breath. • Use your index finger and thumb to plug your nose. • Retain your breath until you feel the urge to breathe, which may include an involuntary movement of your diaphragm and then inhale. • Breathe normally for at least 10 seconds. • Repeat several times.	• Use your index finger and thumb to plug your nose. • Retain your breath for as a long as possible, which is usually twice the length of time of the control pause. • Once you reached the point of moderate discomfort, inhale. • Breathe normally for at least 10 seconds. • Repeat several times.

Pranayama Breathing Technique

Diaphragmatic Breathing (5 Minutes)	Thoracic Breathing (5 Minutes)	Ujjayi Pranayama (5 Minutes)
• Sit or lie in a comfortable place. • Place one hand on your chest and one hand on your abdomen. • Inhale through your nose for about 4 seconds feeling your abdomen expand. • Hold your breath for 2 seconds. • Exhale very slowly and steadily through your month for about 6 seconds.	• Breathe in slowly through your nose so that your stomach moves out against your hand. • The hand on your chest should remain as still as possible. • Tighten your stomach muscles, so that your stomach moves back in as you exhale through pursed lips.	• Stay steady and relaxed. • Keep the spine erect in pranayama postures. • First, sit in a yoga pose like padmasana (lotus pose) with your eyes shut and your back straight. • Take a long deep breath slowly from both nostrils. • Now breathe out by closing your right nostril and exhale form the left nostril. Try to produce the sound. • Take few normal breaths and relax.

2. Data Analysis and Interpretation

6 Minute Walk Test – Group A

The comparative mean values, mean difference, standard deviation and paired `t' values between Pre - test values versus post test values of 6 - minute walk test of Group A is shown in Table 1.

Table 1: Pre - test values versus post test values for 6 - minute walk test of Group A

S. NO	6MWT	Improvement			Paired T values
		Mean	Mean difference	SD	
1.	Pre - Test	14.6	2.1	1.13	10.8 (P<0.05%)
2.	Post Test	12.5		0.97	

6 Minute Walk Test – Group B

The comparative mean values, mean difference, standard deviation and paired `t 'values between Pre - test values versus posttest values of 6 - minute walk test of Group B is shown in Table 2.

Table 2: Pre - test values versus posttest values of 6 - minute walk test of Group B

S. NO	6MWT	Improvement			Paired T values
		Mean	Mean difference	SD	
1.	Pre - Test	15.0	2.9	0.91	21.5 (P<0.05%)
2.	Post Test	10.7		1.31	

6 Minute Walk Test: Group A vs Group B

The comparative mean values, mean difference, standard deviation and unpaired ` t 'values between Group A and Group B on 6 - minute walk test.

Table 3: Comparative values between Group A and Group B on 6 - minute walk test

S. NO	6MWT	Improvement			Unpaired T values
		Mean	Mean difference	SD	
1.	Group A	12.5	1.8	0.97	3.47 (P<0.05%)
2.	Group B	10.7		1.31	

Asthma Control Questionnaire: 6 Group A

The comparative mean values, mean difference, standard deviation and paired `t' values between pre - test values versus post - test values of asthma control questionnaire of Group A (Table 4)

Table 4: Pre - test values versus post - test values of asthma control questionnaire of Group A

S. NO	ACQ – 6	Improvement			Paired T values
		Mean	Mean difference	SD	
1.	Pre - Test	23.7	2.2	1.16	8.81 (P<0.05%)
2.	Post Test	21.5		0.97	

The comparative mean values, mean difference, standard deviation and paired `t' values between pre - test values versus post- test values of ACQ - 6 of Group B (Table 5)

Table 5: Pre - test values versus post - test values of asthma control questionnaire of Group B

S. NO	ACQ – 6	Improvement			Paired T values
		Mean	Mean difference	SD	
1.	Pre - Test	23.5	4	1.08	18.9 (P<0.05%)
2.	Post Test	19.5		1.08	

Asthma Control Questionnaire: 6 Group - A vs. Group - B

The comparative mean values, mean difference, standard deviation and unpaired `t values between Group A and Group B on ACQ is shown in Table 6.

Table 6: Comparative values of asthma control questionnaire between Group A and Group B on 6 - minute walk test

S. NO	ACQ – 6	Improvement			Unpaired T values
		Mean	Mean difference	SD	
1.	Group A	21.5	2	0.97	4.35 (P<0.05%)
2.	Group B	19.5		1.08	

3. Result

A total 20 subjects were taken in this study the Group A consists 10 members and another Group B consists of 10 members. According to the Table - 3, the mean values of two Groups A and B, the Group B 10.7 which was lesser than Group A value of 12.5. The unpaired `t' test value was 3.47 at 0.05 % level which was greater than tabulated value (2.101). Then shows there is a significant reduction in the symptoms in 6 MWT in Group A and B. This also showed that Group B subjects shows marked improvement in 6 MWT. According to the Table - 6 the mean value of two Groups A and B, the mean value of Group B was 19.5 which was lesser than Group A value of 21.5. The unpaired `t' value was 4.35 at 0.05% level which was greater than tabulated value (2.101). Then shows there is a significant reduction in the symptoms in ACQ - 6 in Group A and B. This also showed that Group B subjects show marked improvement in AcQ - 6. Both the groups A and B are reducing symptoms. It showed that there is significant difference in reduction of symptoms, disability level in two groups but there is a marked improvement in the reduction of symptoms in group B.

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