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EFFECTIVENESS OF BREATHING RE-TRAINING VERSUS AEROBIC TRAINING ON DYSPNEA IN ASTHMATICS

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ABSTRACT **Background:** Asthma is a chronic airway inflammatory disorder, characterized by recurrent episodes of wheezing and shortness of breath. Dyspnea, or shortness of breath, is a common symptom of asthma, and can negatively impact a patient's quality of life. **Methods:** 30 subjects with asthma were selected according to selection criteria. Participants were randomly allocated to either Group A Breathing retraining technique (Buteyko Breathing Technique - BBT) or Group B an Aerobic training (AT). Participants in the BBT group received breathing retraining for 4 weeks, while participants in the AT group received aerobic exercises for 4 weeks. Dyspnea was measured using the Medical Research Council (MRC) dyspnea scale before and after the interventions. **Results:** Both groups showed significant improvement in dyspnea within the groups. Though there is no significant difference between two interventions. (P>.05) **Conclusion:** This study concludes that both Group A (BBT) and Group B(AT) equally effective in improving Dyspnea in asthmatics.

KEYWORDS : Asthma, breathing retraining, dyspnea, aerobic.

INTRODUCTION:

Chronic asthma is characterized by wheezing, dyspnea, chest tightness, and coughing and is defined as reversible airflow restriction, inflammation, and hyper responsiveness to various stimuli.(,)The most frequent cause of recurrent or chronic inflammatory airway disease and a major contributor to cough is asthma.[1]While most patients find that inhaled anti-asthma medicine works, there are negative effects linked with asthma medications.

People with asthma may avoid or restrict their physical activity in order to prevent asthma exacerbations, which can have significant detrimental effects on their health. This is true even though there are efficient pharmaceutical and non-pharmacologic methods for managing asthma symptoms during exercise.[2] The use of aerobic exercise in rehabilitation program for asthmatic patients has been shown to reduce dyspnea, airway hyper responsiveness, induce bronchospasm, and even use of corticosteroids. Additionally, these individuals exhibit enhancements in their quality of life and aerobic ability.[3,4] Low- to moderate-intensity aerobic exercise is advised for those with asthma, according to the American College of Sports Medicine (ACSM) and the American Thoracic Society (ATS). The ACSM advises exercising with big muscle groups 3-5 days per week at 50% of maximum effort by walking or engaging in other activities. The ATS advises exercising for 20 to 30 minutes, two to five days a week, at 60 to 75% of one's maximum heart rate.

A growing body of research suggests that a decline in physical activity may contribute to asthma's severity and rising prevalence. The predominant use of aerobic exercise in sport science and medicine has been for the physical rehabilitation of asthma. The advantages of this form of exercise for asthmatics include its capacity to lower ventilatory demand at a given workload, lower airway sensitivity and improve bronchodilation and bronchospasm threshold, increase vital capacity and alveolar gas exchange, which all serve to improve inspiration, reduce air trapping by mechanically positioning the diaphragm in a more advantageous position, and increase oxidative capacity and maximal oxygen uptake (VO2max).[5] Due to its varied affects, the advantage of aerobic exercise does not apply to all asthmatics, and researchers have not yet found the best mode, length, time of session, intensity, or frequency. Less research has been done on the impact of other exercise forms that might have comparable or greater advantages for those with asthma. This study will investigate the differences in the effects of breathing re-training and aerobic training on dyspnea in asthma patients. The results of this study will provide evidence on the effectiveness of breathing re-training versus aerobic training on dyspnea in asthma patients and help to inform treatment decisions for this population.

MATERIALS AND METHOD:

A comparative study design was used for the purpose of the current study .30 patients were selected based on the inclusion and exclusion criteria and informed consent was taken from them, before starting the study. Patients with age group of 30-45 years of age both male and female participants with Dyspnea (MRC) grade > 2 were selected. Participants with unstable vital signs, decreased exercise tolerance and with neurological disorders were excluded from the study. Pateints were assessed at the first day and post test were done at the end of the 4th week after completing the treatments.

Group A & Group B: 15 participants of each group. Both groups initially assessed by the dyspnea grading and values are noted with the help of MRC scale.

Group A are treated with Buteyko breathing technique intensively for 4 days then the following 3 week were 2 session per week.The patients of this group received the designed BBT. Each patient was trained by Buteyko breathing technique twice per week, and the session was about (20 min). The first week each patient of this group trained by Buteyko breathing technique intensively for 4 days then the following 3 weeks were 2 sessions per week. The time of the session was in the morning at least two hours after meals: Each patient performed the technique by himself at home twice daily (in the morning and in the evening, at least 2h after meals) during the time of the study.

Buteyko Breathing Technique: (BBT)

- Position the patient in sitting position
- Ask the participant to take breathe in and out normally (2-3 times)
- Take a small breath in (2 s) and a small breath out (3 s).
- Pinch your nose on the "out" breath,
- Hold your breath as the therapist counts one, two, three
- Release the breath
- Repeat the procedure while the therapist increases hold count up to 5 and then gradually decreases it with each repeat (total-5).

Group B: treated with aerobic exercise with 5 minutes of warmup, 30 minutes of aerobic training and 5 minutes of cool down.

Procedure: Aerobic training

Warm-up: The treatment Begins by warming up for 5 minutes with light stretching or slow walking on the treadmill. This will help increase blood flow and prepare the body for more intense exercise.

Start slow: Instruct the patient to Begin treadmill walking at a slow and comfortable pace. It's important not to push patient too hard at the beginning, especially if patient is new to exercising or have been inactive for a while. Gradually increase the speed and intensity over time as patient body becomes accustomed to the exercise.

Monitor breathing: Make patient pay close attention to their breathing while exercising. If patient start to experience shortness of breath or wheezing, slow down or stop and rest until patient breathing returns to normal.

Use a rescue inhaler: If the patient's doctor has prescribed a rescue inhaler for your asthma, make sure to have it while exercising. Instruct to Use it as directed if they experience any asthma symptoms during their workout.

Cool down: After finishing workout, cool down by walking at a slower pace for 5 minutes. This will help prevent any sudden drops in blood pressure and reduce the risk of injury.

After 4 weeks of the treatment period both group participants were assessed for dyspnea grading. Pre-test and post-test values of both [group A and group B] are statistically analyzed and the results will be interpreted.

Statistical Analysis:

In our study, data were presented as Mean ± SD, proportion or n (%). One-way analysis of variance (ANOVA) and t-test were used for comparison between groups and P values < 0.05 were considered signicant. Statistical analysis was done using software SPSS 20.0 version.

RESULTS:

The study was conducted on 30 subjects with asthma to compare the effectiveness of breathing retraining and aerobic training on dyspnea in asthmatics.

Table: 1 Baseline Charateristic Of Participants

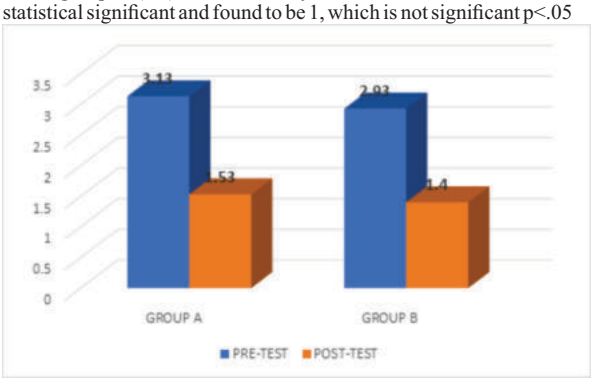
Baseline Characteristic	Group A (BBT) N (15)	Group B (AT) N (15)
Gender, (in mean)	9	11
Male		
Female	6	4
Age (M±S.D)	35±3.91	34.46±3.32
Dyspnea score(1-4) (MEDIAN ± IR)	3±2	3±2

Table 2: The Pre Test And Post Test Difference Values Of Dyspnea Scale In Group A And Group B

Outcome Measure (DYSPNEA SCALE)	Pre-test (MEAN± S.D)	Post-test (MEAN± S.D)	Differece B/W Post-pre (MEAN± S.D)	P Value
Group A (BBT)	3. 13±0.83	1.53±0.91	1.6±0.73	1**
Group B (AT)	2.93±0.79	1.4±0.91	1.53±0.51	

****not significant**

The above table 2, shows that pretest and post test difference values of dyspnea scale from baseline to post test (4th week). For both the group A and group B (AT) Mann Whitney U-test was used to calculate the statistical significant and found to be 1, which is not significant p<.05



Graph 1: Comparision Of PRE And Post Values Of Group A (BBT) And Group B (AT)

DISCUSSION:

In this present study, the main objective of this clinical trial was to find out the Effectiveness of Breathing retraining technique versus Aerobic training on dyspnea in asthma. The study results were interpreted On basis on outcome measure were used in this study. According to the results, the Average changes obtained on the self-reported outcome obtained by the subjects in both The groups, (mMRC Dyspnea scale) Group A (BBT) versus Group B (AT) there Was no significant improvement on dyspnea in asthma patients receiving the interventions. But when compared within the groups there is significant improvement on dyspnea in asthma. This makes a conclusion that both the technique is proportionately improved.

Changes In Dyspnea Between Group A (buteyko Breathing Technique) Versus Group B (Aerobic Training):

The result of this present study showed that comparatively no significant improvement in dyspnea between the Group A (BBT) versus Group B (AT). The pre- and Post-test mean difference was found to be 1.6 and 1.53 from baseline to 4th week for Group A and Group B respectively. These results suggest that there is no difference in dyspnea when compared between the groups, and it is also found to be statistically not significant.

Cooper et al. compared 2 breathing techniques and suggested that only the Buteyko technique produced a reduction in asthma symptoms.[6] **Ritz** et al. observed a significant improvement after breathing exercises guided by capnometry,[7] whereas **Manocha** et al. did not show any improvement in asthma symptoms in patients who performed yoga breathing exercises. Our results also demonstrate that a greater proportion of participants in the aerobic training group presented a reduction in the number of days without the use of rescue medication compared with those in the breathing exercises (34% vs 8%, respectively). [8] Our results are supported by previous studies demonstrating that aerobic training reduced the consumption of rescue medication..[9] Contrary to our results, **Slader** et al. observed that breathing exercises reduced the number of days of rescue medication use by 86%. A possible explanation for this difference between our findings and those of his, is in our study, the reduction was reported spontaneously, whereas in the previous study, the participants were instructed to use breathing exercises before using rescue medication whenever they presented asthma symptoms.[10]30**Robert Cowie** et al. applied Buteyko techniques for 6 months, he found that there were Improvement in Asthma control from 41% to 75%, Decrease of ICS (Inhaled corticosteroids) by 39% and Elimination of ICS was 21% and he was astonished and also very pleased with the excellent result.[11] There is no disruption of their life at all by their disease: normal activities; not waking at night; not needing to use any reliever medications. The neat thing about it is that it has no side effects. It's very safe. The Buteyko technique certainly has been shown to be an important adjunct to treatment. This improvement in group A, who treated by BBT and medications, come in support with the result of The study by **Bowler** et al., who demonstrated inhaled steroid reduction of 49% for the BBT group and 0% for the control group at three months, 95% reduction of □2-agonist.[12]

Use in the BBT group and a 7% reduction in the control group at three months. Also, in a study by **Patrick McHugh** et al. aimed to measure safety and effectiveness, rather than why Buteyko works. It recorded no change in forced expiratory volume. However, there was an 85% reduction in □2-agonists and a 50% reduction in steroid use amongst people who had used the Buteyko method for, and a 1% increase for the control group at six months. A reduction in □2- agonist use, of 37% in the control group at six months. The trial recorded no adverse effects from the use of Buteyko. Even though no study has indicated exactly why Buteyko is so effective at con- trolling asthma, if a drug could show these results, then it is likely that it would be used widely inasthma control.[13]

Dyspnea is one of the main discomforts of COPD patients. Progressive dyspnea can lead to fatigue,[14] prevent physical exercise, and reduce the functional level of patients. Studies found that after aerobic exercise intervention combined with respiratory muscle and auxiliary muscle stretching, the dyspnea of COPD patients decreased, the respiratory efficiency needed for ventilation increased, and upper limb fatigue was significantly improved. We observed that the dyspnea level of patients in the aerobic training group decreased significantly by 0.70 (95% CI:– 1.12, –0.27). This decline may be due to the inclusion of studies involving not only movements of large muscle groups, but also the intervention of respiratory muscle auxiliary muscles. During exercise, passive chest muscle stretching and rib expansion will increase the burden on the diaphragm, which is equivalent to the load training of respiratory muscle groups, which can improve respiratory muscle strength and exercise tolerance. In addition, we cannot completely rule out another explanation, which is that aerobic training has a therapeutic effect on lung function, because we noticed that FEV1%pred and FEV1/FVC%, increased by 2.05 and 3.00, respectively, after aerobic training in thisstudy. Therefore,

aerobic training may relieve hyperinflation by improving lung function and respiratory muscle function, thus improving dyspnea in COPD patients.

Previous studies have shown that under the same exercise intensity, compared with land-based aerobic exercise, the parameters of heart rate and blood lactic acid in water decreased, and dyspnea and fatigue perception were also significantly improved. This study found similar results, specifically, that dyspnea between the 2 groups was similar at the same or relative exercise intensity. However, chronic respiratory disease questionnaire fatigue perception was significantly improved after water-based aerobic exercise. Given these, participants may achieve or even exceed the required exercise intensity through less exercise time in a fatigue-relieving water environment, which is especially important for weak and elderly exercisers.

In Bruurs et al. systematic review, 237 articles were included that investigated the effectiveness of physical training and other modes of physiotherapy in patients with asthma. They found that physical training can reduce symptoms, improve quality of life and improve cardiopulmonary endurance and fitness.

CONCLUSION:

The results of this study will provide important insight into the effectiveness of breathing retraining and aerobic training on dyspnea in asthma patients. These findings will inform the development of evidence-based guidelines for the management of dyspnea in asthma patients. Based on the available evidence both buteyko breathing technique and aerobic exercise appear to be effective in reducing dyspnea (shortness of breath) in asthma patients.

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