

Research on the Impact of Breathing Exercises and Aerobic Exercises on Quality of Life in Patients with Bronchial Asthma: A Comparative Study

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How to cite this article: Chhonker K., Jain K., Shukla G., Srivastava N. Research on the Impact of Breathing Exercises and Aerobic Exercises on Quality of Life in Patients with Bronchial Asthma: A Comparative Study . 2024;18(1):52-56.

ABSTRACT

Background: Asthma is defined as a chronic inflammatory disorder of airways characterized by reversible air-flow obstruction causing cough, wheeze, chest tightness and shortness of breath. Asthmatic attacks are set up by exposure to specific allergens such as house dust mite, pollen and animal dander. Some other factors are exercise particularly running, dyes, air pollution, infection, cigarette smoke, dry inhaled air, certain foods such as fish, eggs, yeast, and wheat which presumably reach the bronchi via blood stream. There is noticeable increase in healthcare burden from asthma in several areas of world. The most frequently mentioned aims of breathing exercises are to 'normalize' breathing pattern by adopting a slower respiratory rate with longer expiration and reduction of hyperventilation and hyperinflation. Training also frequently involves encouraging nasal breathing and a diaphragmatic breathing pattern. AQLQ AND SF36 questionnaire was used as outcome measure.

Methods: The sample size of this study was 30 subjects with 15 subjects in each group. The group A was given breathing exercises interventions and group B was given aerobic exercises intervention. A written consent was taken from each before their participation into the study. Asthma Quality of Life Questionnaire (AQLQ) and SF-36 quality of life Questionnaire of both the groups were taken in 0 week and both groups were assigned treatment interventions and after 3 weeks the AQLQ and SF-36 quality of life questionnaire has been repeated.

The independent variables in the study were Aerobic Exercises and Breathing Exercises.

Conclusion: The breathing exercise intervention was effective in improving the quality of life in asthmatic patients. The aerobic exercise intervention was also effective in improving the quality of life in asthmatic patients. However, the quantum of reduction in lung obstruction and therefore, the overall improvement in quality of life found to be more significant with the aerobic exercise intervention than breathing exercise intervention. Thus, a combination of the breathing exercises and aerobic exercise should be incorporated into the pulmonary rehabilitation program of the asthmatic patients.

Keywords: Asthma, Breathing exercises, Aerobic exercises, AQLQ & SF36 questionnaire.

Consent: informed consent was taken from all participants in the study for the publication work in the journal.

INTRODUCTION

Asthma is defined as a chronic inflammatory disorder of airways characterized by reversible

airflow obstruction causing cough, wheeze, chest tightness and shortness of breath. Asthmatic attacks are set up

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Submission: 3rd Oct 2023

Revision: 18th Oct 2023

Publication date: 9th Jan 2024

by exposure to specific allergens such as house dust mite, pollen and animal dander. Some other factors are exercise particularly running, dyes, air pollution, infection, cigarette smoke, dry inhaled air, certain foods such as fish, eggs, yeast, and wheat which presumably reach the bronchi via blood stream. There is noticeable increase in healthcare burden from asthma in several areas of world. Over 50 million people in Central and Southern Asia have asthma and many do not have access to the medications that control the disease. Significant changes were observed in FEV1, FVC, PEF, PEF25-75%, MVV, RF and 6MWT between asthmatic patients of the two groups ($P \leq 0.05$), but FEV1/FVC showed no significant changes.

Many studies have been conducted related to prevalence of asthma; few studies have tried to examine the efficacy of breathing exercise and aerobic exercise in a single study. Therefore, the present study was conducted to compare the role of breathing exercise with that of aerobic exercise in the patients of asthma. The study has also explored physiological capacities of lung in these patients. Asthma is the most common chronic illness of childhood, affecting approximately 10% of children¹. In the United States alone, approximately 2.2 million ambulatory care visits per year are made by children for the treatment of asthma². Asthma is an inflammatory disorder with airway hyperresponsiveness leading to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, especially during the night and the early morning^{1,2}.

The most frequently mentioned aims of breathing exercises are to 'normalize' breathing pattern by adopting a slower respiratory rate with longer expiration and reduction of hyperventilation and hyperinflation. Training also frequently involves encouraging nasal breathing and a diaphragmatic breathing pattern. This is based on the assumption that patients with asthma have abnormal or dysfunctional breathing patterns⁷.

Although aerobic exercise can provoke Exercise-Induced Bronchoconstriction (EIB) in patients with asthma, regular physical activity and participation in sports are considered to be im-

portant components in the overall management of asthma.

A recent international guideline regarding physiotherapeutic management of adult patients recommends breathing exercises for patients with asthma to increase asthma control and quality of life (evidence grade A). Physical training is advised to increase fitness and cardio-respiratory endurance, to decrease dyspnoea and improve quality of life (evidence grade B).

METHODOLOGY

The sample size of this study was 30 subjects with 15 subjects in each group. The group A was given breathing exercises interventions and group B was given aerobic exercises intervention.

These thirty subjects suffering with asthma were recruited for the study. A written consent was taken from each before their participation into the study. Asthma Quality of Life Questionnaire (AQLQ) and SF-36 quality of life Questionnaire of both the groups were taken in 0 week and both groups were assigned treatment interventions and after 3 weeks the AQLQ and SF-36 quality of life questionnaire was repeated. The independent variables in the study were Aerobic Exercises and Breathing Exercises.

The dependent variable in the study were AQLQ and SF-36 quality of life Questionnaire score. Dependent variable was measured initially at baseline and then at three weeks for both groups.

Breathing exercises intervention include Diaphragmatic breathing exercise practised for 15 minutes. This exercise was performed in Semi-Fowler's position with the patient totally relaxed. Ask patient to place his/her hands on abdomen, on rectus abdominis just below anterior costal margin. Ask the patient to breath slowly and deeply through the nose. The patient should keep the shoulders relaxed and upper chest quiet allowing the abdomen to rise slightly. Then tell the patient to relax and exhale through the mouth. Do not allow the patient to hyperventilate.

Pursed -lip breathing exercise intervention should be practised after diaphragmatic breathing exercise intervention for another 15 minutes.

Patient is allowed to have rest in between the two interventions, not more than two minutes. This process involves pursing both the lips together while controlled exhalation. Now exhale through pursed lips and count till four.

Aerobic exercise intervention includes

- 1) **Warm up Phase**-to raise heart rate and temperature of muscles to provide adequate blood flow .This phase included general range of motion and flexibility exercises like arm circles, toe raises, half knee bend and running in place.
- 2) **Activity Phase**-included the rhythmic steps of aerobics with graceful dance movements with less jumping action, but more of footwork, which were coordinated with the rhythm of the music being played.
- 3) **Cool down Phase**-to gradually bring down the heart rate and metabolism to near normal.
- 4) **Duration Of Exercise**- 5-7 mins of warm-up 20 mins of activity. 5-7 mins of cool down period.
- 5) **Frequency Of Exercise**- 5 times a week for 3 weeks.

DATA ANALYSIS

Table 1: Mean and Standard Deviation Values of Pre And Post Scores of Asthma Quality of Life Questionnaire for Group Of Patients Receiving Breathing Exercises.

Subjects	Mean	Standard Deviation	Change in Value
PRE	30.2	18.6	18%
POST	36.7	18.1	

Table-2: Mean And Standard Deviation Values of Pre and Post Scores of Asthma Quality of Life Questionnaire for Group of Patients Receiving Aerobic Exercises

Subjects	Mean	Standard Deviation	Change in Value
PRE	31.2	17.5	23 %
POST	39.6	17.4	

Table 3: Mean Values For Pre And Post Sf-36 Questionnaire For Patients Receiving Breathing Exercise

Sf-36 Questionnaire	Mean Values	Sd Values	% Change
NORMAL	41.6	23.5	22%
POST (03 WEEKS)	51.4	24.6	

The mean of SF-36 questionnaire before and after 3 weeks shows 22 % values significant increase in quality of life following the treatment session.

Table 4: Mean Values For Pre And Post Sf-36 Questionnaire For Patients Receiving Breathing Exercises

Sf-36 Questionnaire	Mean Values	Sd Values	% Change
NORMAL	41.6	21.4	25&
POST (10 WEEKS)	55.4	22.1	

The mean of SF-36 questionnaire before and after 3 weeks shows 25 % values significant increase in quality of life following the treatment session .

DISCUSSION

Effect of breathing exercise intervention on Quality of Life of asthmatic patients

While analysing the effects of breathing exercise intervention on quality of life, it was found that overall improvement is % on the scale of Asthma quality of life questionnaire and % improvement in SF-36. Thus, breathing exercises have helped in improving all the of the asthmatic patients. Breathing exercises helped the patients to get back to their normal way of breathing process. It produced relaxation of accessory muscles.

Effects of aerobic exercise intervention on Quality of Life of asthmatic patients

The results of present investigation also exhibited % increase in the Asthma quality of life questionnaire and 24% increase in SF-36 values. The present finding that aerobic exercise improvised the activity in daily life of patients with bronchial asthma.

Ortancil O.et al. conducted a study on Twenty-two asthma patients. Breathing exercises and upper extremity exercises were taught to all the patients. The patients were then asked to practice these exercises at home individually for 6 weeks⁹.

Kelly and Johnson conducted a study on the effects of aerobic exercise on resting systolic and diastolic blood pressure among asthmatic adults. The results of this study suggest that aerobic

exercise resulted in small reductions on resting systolic and diastolic blood pressure among asthmatic adults.¹

Statistical analysis suggested that there was no significant difference in the level of improvement of quality of life. It is the well-known fact that in the normal breathing pattern the diaphragm moves downward when the person inhales and moves upward when the person exhales. However, an asthmatic patient breathes in an abnormal way by using only the upper portion of the chest for breathing. Over the period of time the patient develops weakness of chest muscles as the muscles are not being used properly. The findings of the present study have demonstrated that for the asthma patients breathing exercises can really help in reducing the airways obstruction. In addition to this, the breathing exercises help the person to use the inspiratory muscles. This mechanism may have helped in overcoming the feeling of the suffocation and breathlessness in the patients. During aerobic exercise, minute ventilation increases and an increased load is placed on the respiratory muscles. Both the frequency and the speed of contraction in the muscle are increased.

There were certain limitations during the study. As the study was basically for quality of life measurement spirometer and measurements of lung volumes was not used which would have solidified the results obtained further.

This study implies that breathing exercises and aerobic exercises not only helps improve respiratory function of patients with bronchial asthma but also helps in improving their quality of life.

CONCLUSION

In the present study it was concluded that- The breathing exercise intervention was effective in improving the quality of life in asthmatic patients. The aerobic exercise intervention was also effective in improving the quality of life in asthmatic patients. However, the quantum of reduction in lung obstruction and therefore, the overall improvement in quality of life found to be more significant with the aerobic exercise intervention than breathing exercise intervention.

Thus, a combination of the breathing exercises and aerobic exercise should be incorporated into the pulmonary rehabilitation program of the asthmatic patients.

Ethical Clearance: This study was approved by our institutional ethical committee.

Source of funding : self

Conflict of interest : nil

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