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"EFFECTIVINESS OF PAPWORTH METHOD VERSUS BUTEYKO TECHNIQUE IN IMPROVING QUALITY OF LIFE IN MILD TO MODERATE ASTHMATIC PATIENTS - A RANDOMISED COMPARATIVE STUDY"

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Abstract— **TITLE OF THE STUDY: Effectiviness of papworth method versus buteyko technique in improving quality of life in mild to moderate asthmatic patients- A Randomized comparative study**
OBJECTIVE: The purpose of this study was to determine effectiveness in papworth method and butekyo in patients in moderate asthma. 40 patients are selected according to the inclusion and exclusion criteria.
METHODOLOGY: Patients are assigned in 2 groups by using random allocation method. Group-A (papworth method) consists of 20 patients, Group-B (buteyko) consists of 20 patients. Before starting the intervention pre assessment was taken by using outcome measures Nijmegen dysfunctional breathing questionnaire and peak expiratory flow rate has been noted in 2 the groups.
PROCEDURE: The intervention program is given for 4 weeks in Group-A papworth method exercises and Group-B received buteyko. After the completion of 4 weeks intervention post-test assessment has been taken by using outcome measures of Nijmegen dysfunctional breathing questionnaire and peak expiratory flow rate.
RESULTS: Statistical analysis of the data in both the groups A and B had shown significant difference in pre and post intervention. But on comparing the mean values of Group A & B, Group A has shown more improvement than Group B.
CONCLUSION: This findings suggests, papworth method combined along with buteyko technique is more effective in moderate asthma patients.

Keywords— **Asthma, Papworth method, Buteyko method, Nijmegen dysfunctional breathing questionnaire.**

I. INTRODUCTION

Asthma is a chronic condition, defined as airway inflammation. It is characterized as respiratory symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airway limitation1,2,3
Asthma is one of the most common chronic respiratory disease which has been growing international issue as its occurrence has been expanding in adults and children4,5
Asthma is been affecting 1-18% of population in different countries, Approximately 300 million asthma patients are been estimated world-wide and 15 million disability- adjusted life years are lost annually6,7
Asthma arises from an interaction between host and environmental factors. In current years, there is rapid increase

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in asthma due to changes in genetic and environmental factors and further due to increased indoor air contaminant exposures8.

Asthma, a serious health and socio-economic issue all over the world, is considered as an inflammatory disease that affecting the airway which leads to hyper-responsiveness, obstruction, mucous hyper production and wall of airway remodelling9,10.

- Grading of Asthma severity11
- Mild Intermittent Asthma
- Mild symptoms of Asthma occur no more than two days per week or two times per month
- Mild persistent Asthma
- Mild symptoms occur more often than twice per week
- Moderate persistent asthma
- Increasingly severe symptoms of Asthma occur daily and at least one night each Week
- Flare ups also Last several days
- Severe persistent Asthma.

At this stage, Symptoms occur several times per day almost every day. You may also Experience symptoms many nights each week. This stage of Asthma may not respond well to treatment.

Two different phenotypes which are different in immunologic, pathologic, physiologic and epidemiologic levels exist. Early onset of severe asthma is more allergic than compare to late onset of severe asthma. They are defined based on the basis of presence and type of inflammation12,13,14.

The asthma is a condition, in which it is understood poorly and feels stressful while taking care for it, because it is a heterogeneous disease15. The important elements for the development of disease include genetic and environmental factors which are poorly understood and include both allergic and non- allergic elements16. The patients physiologically have air-trapping, high degree of methylcholine hyper responsiveness, airway collapsibility17.

II. MATERIALS AND METHODOLOGY

METHODOLOGY:
STUDY DESIGN:
Sample size: 40, 20 in each group.
Sample method: Randomized sampling.
Study type: comparative study.
Study population: both male and female age groups from 16-70 years.
Study period: 12 weeks.
Study area: physiotherapy outpatient department and Pulmonology Department in MNR hospital, sangareddy.
MATERIALS REQUIRED: Incentive spirometer

INCLUSION CRITERIA:[18,19,20]

1. Patients who are able to read and write English
2. Patients between 16-70 years of age
3. Patients who are willing to attend 12 weeks of study period
4. Patients with no serious co-morbidities

EXCLUSION CRITERIA:[21,22]

1. Patients who are unable to read and write English
2. Patients below 16years and above 70 years of age
3. Patients who are not willing to attend the complete study period of 12 weeks.
4. Tumors, osteoporosis, prolong history of steroid use, severe vascular disease or any serious co-morbidities

OUTCOME MEASURES:

1. Nijmegen dysfunctional breathing questionnnaire[23]
2. Peak expiratory flow rate[24].

. **Method of data collection**:

This study was reviewed and approved by Ethical Committee. Then forty patients was recruited from outpatient department of Sanjeevani College of Physiotherapy, Sangareddy. The subjects was screened according to the inclusion and exclusion criteria and those who reached the criteria were included for the study. A informed consernt was taken each participant. Patients were randomly allocated into two groups by block randomization method. The samples equally divided into two groups, in which 20 subjects were assigned in Group-A and 20 subjects were assigned in Group-B respectively. Subjects in Group-A received papworth method and subjects in Group-B received buteyko technique. Total duration of the intervention was for four weeks with four sessions per week.

Materials used: Treatment couch.

Measurement Procedure:

The Nijmegen Questionnaire (NQ) gives a broad view of symptoms associated with dysfunctional breathing patterns. The Nijmegen Questionnaire was introduced over 30 years ago as a screening tool to detect patients with hyperventilation complaints that could benefit from breathing regulation through capnographic feedback.[25,26,27,28] The Nijmegen questionnaire consists of 16 items to be answered on a five-point scale ranging from 'never' counted as zero to 'very often' counted as 4. The total score ranges from 0-64. Completion of the questionnaire only takes a few minutes. A score of over 19 denotes the presence of respiratory distress and dysfunction. The higher the score, the more distress is present. Values below 20 are considered within the normal and functional domain.[29,30] Peak expiratory flow rate (PEFR) is the volume of air forcefully expelled from the lungs in one quick exhalation, and is a reliable indicator of ventilation adequacy as well as airflow obstruction it is measured by using peal flow meter.[31,32,33]

PROCEDURE:

GROUP: A
PAPWORTH METHOD:[34]

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The PM integrates five components, the principal one being specific breathing training. Breathing training, including teaching of appropriate minute and tidal volume and the development of a pattern of breathing suitable to current metabolic activity. Elimination of dysfunctional breathing, including hyperinflation and hyperventilation patterns is discussed. A specific Papworth method diaphragmatic breathing technique is taught to replace the use of inappropriate accessory muscles of respiration. Emphasis, when relaxed, is placed on calm slow nasal expiration. Patients are encouraged to ‘‘nose- breathe’’ rather than ‘‘mouth breathe’’ and eradication or reduction of habits such as yawning, sighing, etc is taught and practiced. Education, with the emphasis on the recognition and physical management of stress responses and specifically the interaction with breathing patterns. Relaxation training, specific and general. Integration of ‘‘appropriate’’ breathing and relaxation techniques into daily living activities. Initially the techniques are taught in a semi-recumbent position progressing to sitting, then standing and during daily living activities. Finally, the integration of breathing and relaxation techniques into speech is taught and practiced. Home exercises with an audiotape or CD containing reminders of the breathing and relaxation techniques are supplied at the third treatment. Encouragement is given to practice at least once a day with the tape.

GROUP: B

BUTEYKO TECHNIQUE[35]: It is one of the simple breathing exercise that is used to correct breathing technique in order to maintain the correct ratio of oxygen to carbon di oxide. The buteyko technique uses shallow breathing through the nose to correct the breathing pattern; this normalizes the ratio of gases within the body, which in turn relieves symptoms of respiratory conditions. Benefits of Buteyko technique are improved exercise tolerance, improved quality of life, reduced mucous production, and coughing becomes easier.

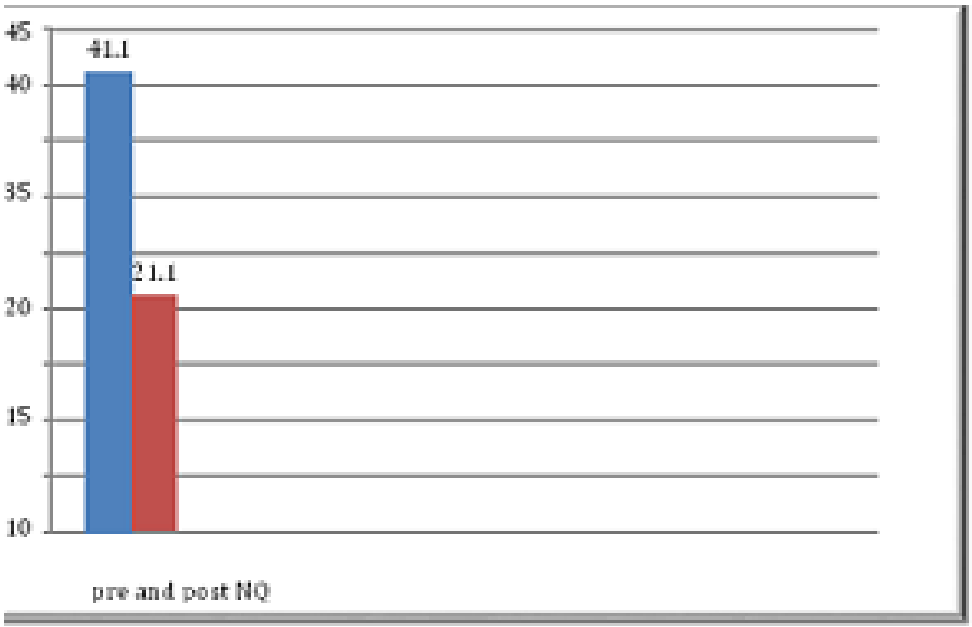
STATISTICAL ANALYSIS

The statistical analysis was done by using a software SPSS ver16.0. The general characteristics of the participants were expressed in terms of mean and standard deviation by using descriptive analysis.[36,37,38] To comparison for within the group between pre and post intervention, paired t-tests were performed. And independent t- test was used for comparing differences between the groups.[39,40] The statistical significance level was set at equal to or less than 0.05 for all tests.

III. EXPERIMENT AND RESULT

RESULTS:

GROUP A



BAR GRAPH SHOWING PRE AND POST MEAN VALUES OF NO IN GROUP A

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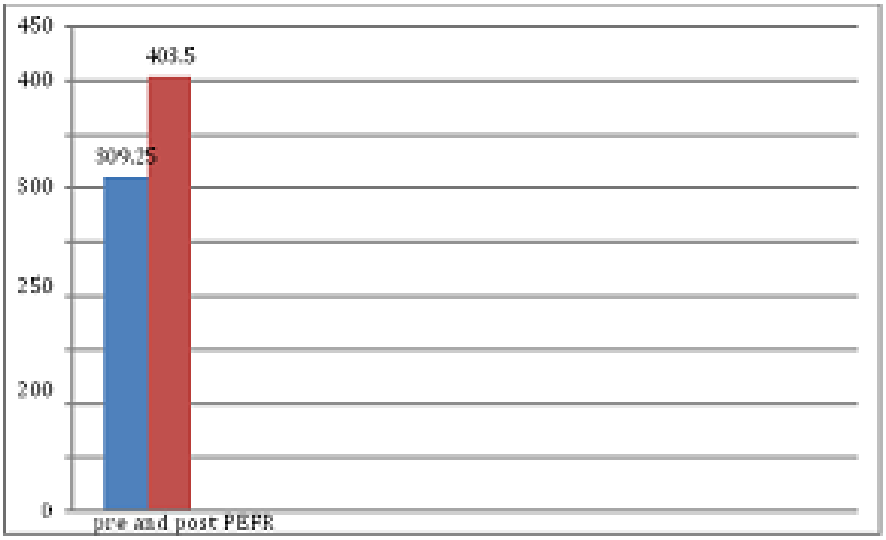
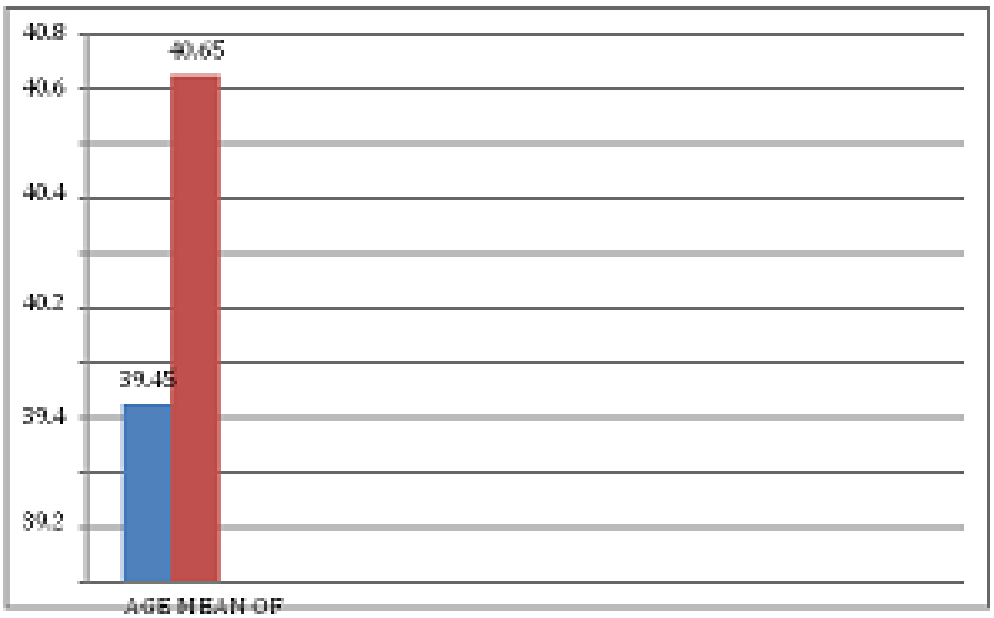


BAR GRAPH SHOWING PRE AND POST MEAN VALUES OF PEFR OFGROUP A



BAR GRAPH SHOWS THE MEAN VALUES OF AGE BETWEEN GROUP A AND GROUP B

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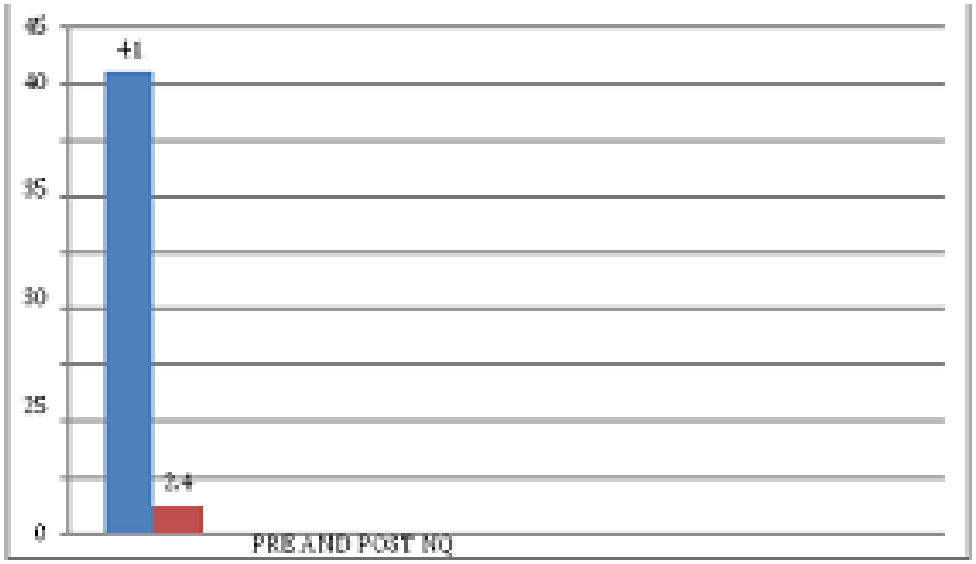
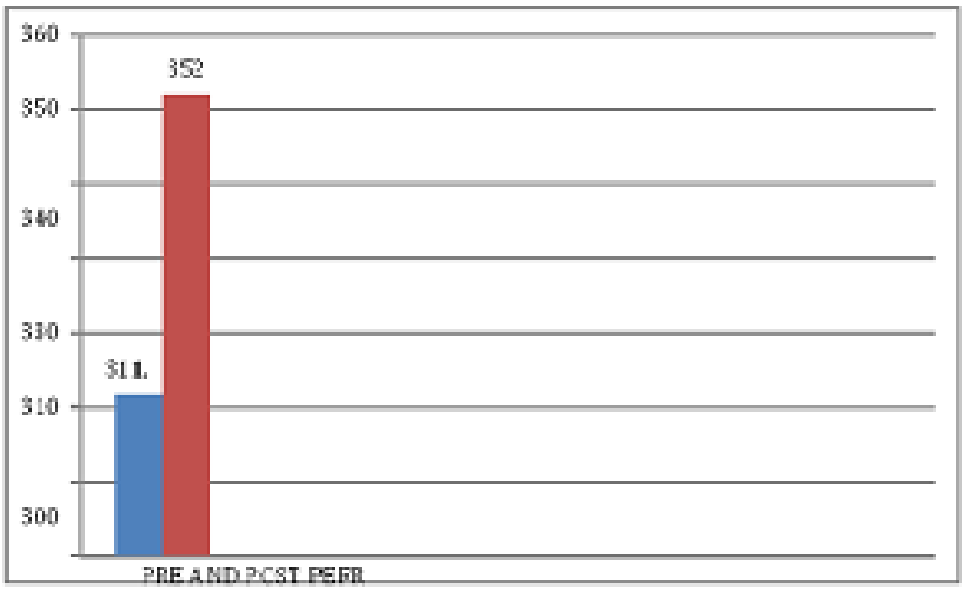


BAR GRAPH SHOWING PRE AND POST MEAN VALUES OF NQ IN GROUP B



BAR GRAPH SHOWING PRE AND POST MEAN VALUES OF PEFR OFGROUP B

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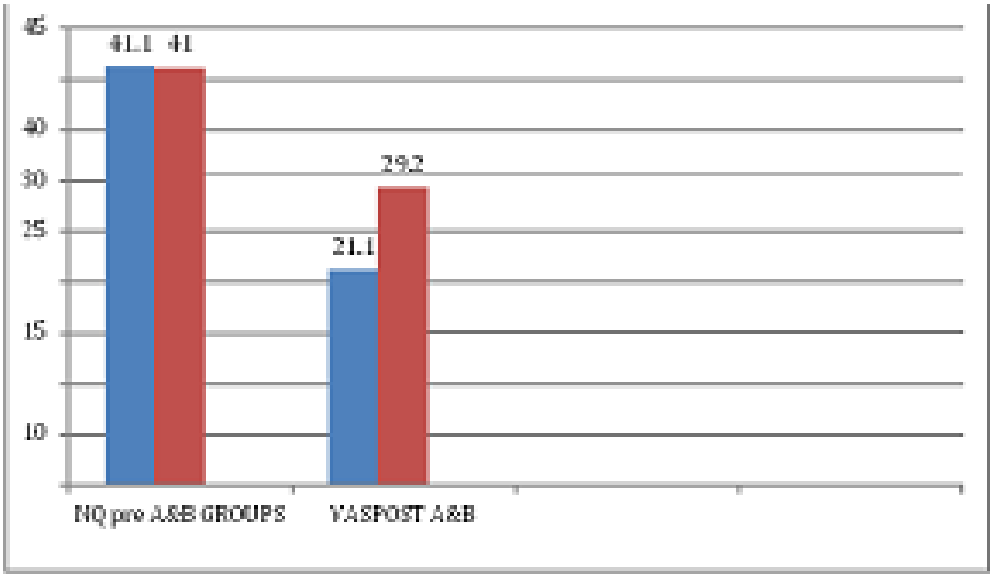
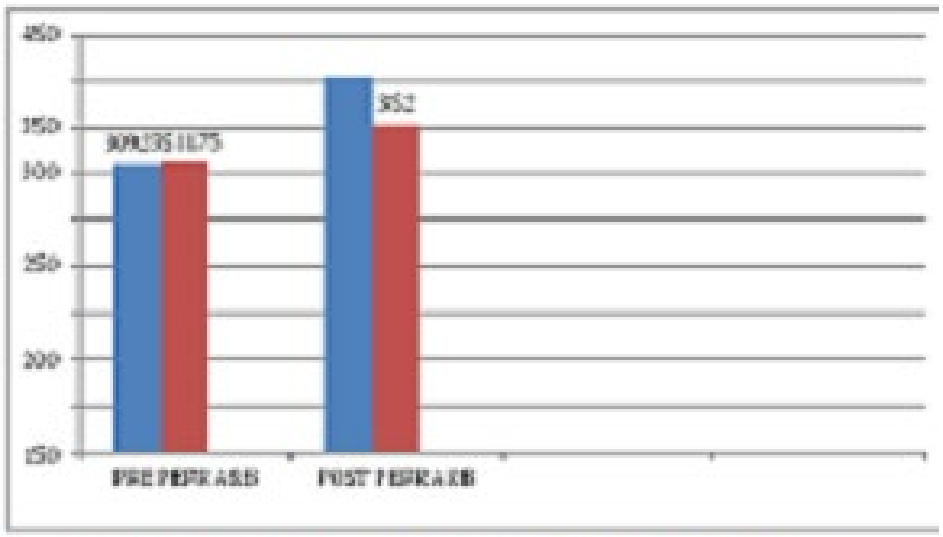


BAR GRAPH SHOWING THE PRE AND POST TEST MEAN VALUES OFGROUP A AND B



BAR GRAPH SHOWING PRE AND POST TEST MEAN VALUES OF THE PEFR GROUP A AND B

As observed the output, there is a no such significant differences exist between the pre interventionvalues between GROUP A & B of NQ PEFR.

As observed the output, there is a marked significant difference exist between post intervention values of GROUP A & B of NQ PEFR.

Statistical analysis of the data shown that is no significant difference of age that exists between group A and B (p value >0.05). There is homogeneity that maintained between the groups regarding the age. Data indicate that there is no much significant difference that exists between group A and B of NQ PEFR in pre-test.

There is a marked significant difference that exists between the pre and post of NQ PEFR in group A. There is a marked significant difference that exists between the pre NQ PEFR in group B. There is a significant difference that exists between the pre and post NQ ANDPEFR of group A & B.

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The Mean values of the outcome measures between group A and B:

Mean value	GROUP-A	GROUP-B
NQ PRE	41.10	41.00
NQ POST	21.10	29.20
PEFR PRE	309.25	311.75
PEFR POST	403.50	352.00

The both groups A and B has shown an significant difference from pre to post intervention. But by comparing the mean values of Group A & B, Group A (PAPWORTH)showed more improvement than Group B(BUTEYKO)[44,45]

RESULTS

The statistical analysis of the data that has shown between group A and B had a significant difference in pre to post intervention. But on comparing mean values of Group A & B, Group A showed more improvement than Group B.

IV. DISCUSSION

Asthma is characterized is an acute episodes of dyspnoea, cough, and wheezing generally lasting minutes to hours1 Exceptionally, asthmatic episodes can lead to complete airway obstruction and death.2 The pathophysiological mechanism that underlying the bronchial hyper- responsiveness that characterizes asthma is poorly understood, but is believed to involve airway inflammation.3,4,5 As such as preventative treatments for asthma are mainly immunemodulators such as steroids or mast cell stabilizers. Symptomatic treatment of asthma revolves around relieving airway constriction by promoting airway smooth muscle relaxation with beta-adrenergicagonists.10,11,12,13,14

Asthma is a debilitating, chronic disease characterized by airway hyper- responsiveness and associated respiratory symptoms.15,16,17,18,19,20 Asthma is extremely common and is one of the leading presenting complaints for patients, in general practice in India and the UK . It has been estimated that in the USA, asthma management costs exceed $USA 12.7 billion per year. Symptomatic treatments provide short term relief from the symptoms of asthma but do not prevent further episodes. A recent study of asthma patients reported that patients use a variety of alternative treatments for asthma which have unknown or no efficacy including yoga, homeopathy, kinesiology, massage therapy, osteopathy, acupuncture.21,22,23,24,25

A sequence of integrated breathing and relaxation exercises known as the Papworth method was developed in the 1960s.4,5,6,7 This method focuses on problems of dysfunctional breathing including hyperventilation and hyperinflation that are often found in asthma sufferers.3 The cycle of breathlessness and wheezing is frequently accompanied by anxiety and compounded by complex physiological mechanisms.8

It is believed that the Papworth method leads to reduced asthma symptoms, anxiety and symptoms arising from hypopnea. A Cochrane review on breathing exercises for asthma found seven small-scale randomized controlled trials satisfying its inclusion criteria.9 Trends towards improvement were found but no reliable conclusions could be drawn concerning the effectiveness of breathing training for asthma, and it was recommended that further trials be undertaken.10

The interventions included in the review were predominantly based on either ancient yoga practices11,12 or ‘‘Buteyko techniques’’, where emphasis is placed on hypoventilation and a reduction in b2 agonist use.13 To our knowledge, no randomized controlled trials of the Papworth method exist, despite the fact that it is in quite widespread clinical use.

Several breathing techniques have been suggested to help control asthma, but have substantially different techniques and proposed mechanisms. Proponents of Buteyko breathing techniques have suggested that asthma is the body's normal defense mechanism against chronic over breathing.

In particular it is believed that the pathophysiology of asthma is mediated by hypopnea secondary to chronic hyperventilation. Buteyko breathing techniques aim to increase awareness of breathing in general and to normalize ventilation by reducing tidal volume and respiratory rate. In addition patients are encouraged to breathe through symptoms and to only use symptomatic control medication if symptoms persist.

Recent results support the hypothesis that the Papworth method ameliorates respiratory symptoms and improves quality of life in a general practice population of patients diagnosed with asthma. The effect was observed with reported symptoms and mood but significant effect was observed on objective measures of lung function. To our knowledge, this is the first evidence from a controlled trial to demonstrate the effectiveness of the Papworth method.

In present study both the butekyo and papworth techniques are shown significant results but compared to butekyo papworth method shown good results in moderate asthma patients.

V. LIMITATIONS

- Limitations of the study are the subjects with wide range group between 30 to 60 years of age were considered for the study, and hence results cannot be generalized to individual age
- Sample size was small
- There was lack of control group.
- No follow-ups were made after the final treatment and due to which the Maintenance of the improved outcome or re-occurrence of the condition Could not be assessed.

RECOMMENDATIONS FOR FURTHER STUDIES

- Study should be carried out on larger population.
- Follow up should be done to rule out the long term effectiveness of the therapy.
- Study can be conducted on different age groups.
- Changes in the exercise protocol can be done.

VI. CONCLUSION

This study concludes that, when the results are analyzed with in the groups pre and post intervention of the treatment, both groups i.e. papworth method and buteyko technique has shown a statistically significant effects on the improvement of Nijmegen dysfunctional breathing questionnaire and peak expiratory flow rate in subjects with moderate asthma.

Among both the treatments, papworth method group is found to be clinically more effective with greater percentage of improvement than buteyko technique alone. Further between the groups comparison found that there is statistically significant difference and better improvement of all outcome measures in papworth method. In conclusion, the present study provides evidence to support the use of physical therapy regimen in the form of adding papworth method to buteyko technique for better improvement in Nijmegen dysfunctional breathing questionnaire and peak expiratory flow rate in subjects with moderate asthma.

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