Review Article

IMPLICATION OF BUTEYKO BREATHING TECHNIQUE IN ASTHMATIC POPULATION: A LITERATURE REVIEW

ABSTRACT

BACKGROUND: Complementary and experimental medicine is gaining interest in the treatment of asthma around the world. This study summarizes the literature on complementary and alternative medicine approaches that use breathing retraining, i.e Buteyko breathing technique **(BBT)** as a primary component.

AIM: The aim of this research is to provide background for BBT, analyse the available evidence for its efficacy, and evaluate the physiological framework behind it.

METHODS: The analysis of literature is carried out by studying papers from electronic databases such as Cochrane, Medline, Embase, AMED, PEDro, Google Scholar, Elsevier, APTA, Campbell, Web of Science, and ResearchGate.

CONCLUSION: Individual studies using BBT consistently showed a reduction in asthma medication use. In either of the BBT experiments, no significant difference in lung ability was found. BBT detractors argue that drug reduction can be due to the physicians' influence, which is difficult to determine. Longer follow-up is needed to show that the improvement in asthma treatment as measured by drug usage is sustained over a clinically appropriate time span.

KEYWORDS: Asthma, Breathing Techniques, Buteyko, Apnoea, Alternative Therapy, Randomized Controlled Trials, Quality of Life, BBT.

INTRODUCTION

Asthma is a persistent respiratory and assorted condition affecting 1-8% of the population in different countries. It is characterized by chronic airway inflammation with variable symptoms like a wheeze, shortness of breath, chest tightness or cough, and expiratory airflow limitation, which is often triggered by factors such as exercise, allergen or irritant exposure, change in weather, or due to respiratory indisposition of virus.[1]

According to CDC (Centers for Disease Control and Prevention) data, in the USA, asthma prevalence in 2017 is 7.9%, with rates higher in children (< 18 years,8.4%) than in adults (18+ years, 7.7%). Asthma incidences have increased in the USA from 7.3% in 2001 to 7.9% in 2017. Globally, asthma remains the common cause for relevant morbidity and mortality.[2] The prevalence rate in the Indian population for asthma has increased from 7.9% in 2004-2005 to 10.1% in 2011-2012 among adults.[3]

Dr. Konstantin Buteyko, a Russian medical scientist, proposed that there was a strong connection between our breathing patterns and our overall well-being. Buteyko devised a method for retraining the unconscious breathing system. There were no medications or surgeries used. Instead, patients were taught a guided training regimen in personalized breathing manoeuvres. Dr. Buteyko discovered that as patients changed their breathing, the incidence of symptoms across a wide range of clinical illnesses decreased. As he publicly presented his observations and a detailed scientific interpretation to Russia's medical establishment in 1960, they were outraged at the suggestion of a non-medical procedure with superior effects. However, by 1967, government figures showed that Respiratory Reconditioning had "cured" over 1000 people with asthma, hypertension, and other associated illnesses. The medical establishment's reaction was to forbid publishing or even lectures on the phenomenon.[4,5,6]

Pharmacotherapy for the asthmatic patient includes bronchodilators (salbutamol, levalbuterol) which inhibit the constriction of bronchial smooth muscles which is seen in asthma, and anti-inflammatory drugs (such as glucocorticoids, leukotriene modifiers, and mast cell stabilizers) which are used to reduce the chronic inflammatory process that promotes bronchospasm in asthma. The main objective of pharmacologic therapy is to deliver rapid relief of acute asthma symptoms and to initiate long-term control of inflammation and bronchospasm.[4] According to the BTS guidelines, hypoxia should be corrected using high concentrations of inspired oxygen (40-60%) via a high flow mask along with the use of oxygen-driven nebulized beta-agonist (salbutamol). Corticosteroids can be administered orally as prednisolone or parenterally as hydrocortisone. In most severe exacerbations, BTS recommends the preposition of continuous nebulization.[7,8,9] The Buteyko Method is fundamentally a breathing training approach that instructs patients on how to control their habit of over-breathing or hyperventilating. It is based on the hypothesis of the late Ukrainian Physician Dr. Konstantin Buteyko, who suspected that carbon dioxide deficiency was a major cause of many chronic diseases. He asserted that his method of breathing retraining, which focuses on raising carbon dioxide, could reportedly benefit up to 150 diseases. The Buteyko Breathing Technique (BBT) is based on plummeting minute volume by slowing the respiratory rate with breath-counting, using distraction by shaking and walking, and at night lying on the left side and taping the mouth closed. BBT is proposed to decline pulmonary ventilation which increases the carbon dioxide levels in body. The increase in the levels of carbon dioxide leads to an increase in

the oxygen partial pressure that forces the oxygen to be released from the haemoglobin (Bohr Effect).[10]

Individuals who perform and practice BBT (Buteyko Breathing Technique) continue to use their medications prescribed while learning the method. After a few weeks or so, the individuals may find out that they need to use notably less symptomatic reliever medications like a beta-agonist.

The BBT teaches you how to breathe properly through the nose (not the mouth) and with the diaphragm to improve nitric oxide and carbon dioxide levels in the body. When done properly, Buteyko's breathing encourages the activation of the parasympathetic nervous system, as a consequence of which blood pressure is reduced, depression is reduced, and the immune system is strengthened.[11,12,13] The purpose of this study was to deliver context about BBT, review the accessible corroborations for its effectiveness, and appraise the physiological idea behind it.

METHODOLOGY

The research was carried out by examining the specifics of previously published papers.

YEAR: 1998-2020

KEYWORDS: Asthma, Breathing Techniques, Buteyko, Apnoea, Alternative Therapy, Randomized Controlled Trials, Quality of Life, BBT

INCLUSION CRITERIA: 1] Randomized Controlled Trial
2] Case Study
3] Systematic Review
4] 1998 to 2020

EXCLUSION CRITERIA: 1] Comparative Study
2] Narrative Review
3] Papers including multiple conditions

LITERATURE REVIEW

TABLE - 1

JOURNAL NAME & YEAR OF PUBLICATION	TITLE OF THE STUDY AND AUTHOR	AIM	METHODOLOGY	CONCLUSION
Medical Journal of Australia (1988)	A randomized controlled trial of Buteyko breathing techniques in asthma.[14] Simon D Bowler, Amanda Green and Charles A Mitchell	The objective is to evaluate the effect of Buteyko breathing technique (BBT) on the management of asthma.	In this study, the subjects were randomized, if they were using at least 1400µg of short acting β_2-agonist or equivalent doses of nebulized or long acting β_2-agonist in the last week of the run-in period. 39 adults in 2 groups, aged 12 to 70 years, with asthma and considerable medication use, underwent training simultaneously over seven days. Each session lasted 60-90 minutes. The intervention group were taught BBT and the control group were given general asthma education and relaxation techniques and were taught abdominal breathing exercises. Both the group instructors made follow-up calls. Medication use; morning PEF; FEV_1; MV; $ETCO_2$; QoL score, were quantified at three months.	Performing BBT showed reduced hyperventilation and the utilization of beta-2-agonists, improving quality of life without changes in objective measures of airway caliber.

Journal of Asthma (2000)	A Clinical Trial of the Buteyko Technique in Asthma as Taught Breathing by a Video.[15] A. J. Opat, B.Med.Sc.,[1] M. M. Cohen, Ph.D.,[2] M. J. Bailey, M.Sc.,[1] and M. J. Abramson, Ph.D.[1]	The study is aimed at examining whether BBT is a potent asthma therapy as taught by video.	36 adults in 2 groups, aged between 18 to 50 years, who had previously been diagnosed with mild to moderate asthma and had access to a video cassette recorder throughout the trial period, were randomly assigned to either a BBT or a placebo video to watch twice a day at home for 4 weeks. Both before and after the intervention, asthma-related quality of life, peak expiratory flow rate (PEFR), symptoms, and asthma drug consumption were evaluated.	The study put forward that BBT is possibly a useful adjunct to pharmacological therapy in the treatment of asthma. BBT, as shown in a video, improved the quality of life and reduced dependency on bronchodilator medication.

The New Zealand Medical Journal (2003)	Buteyko Breathing Technique for asthma: an effective intervention.[16] Patrick McHugh, Fergus Aitcheson, Bruce Duncan and Frank Houghton.	To assess the impact of BBT on medication use in asthma.	In this Blinded RCT, comparing BBT with the control group (Education and relaxation) was carried out in 38 adults in 2 groups with asthma. Respondents were eligible for inclusion if they were between 18 to 70 years old. They were followed for 6 months following the intervention. Symptom score, medication use and FEV_1 were recorded.	The ability to produce marked reductions in asthma-drug utilization suggests that the pharmaco-economic implications of BBT merit further study. BBT represents a safe, efficacious alternative for the management of asthma.

Complementary Therapies in Medicine (2005)	The Buteyko breathing technique for asthma: A review.[17] A. Bruton[a, *,] G. T. Lewith[b]	The purpose of the article is to provide some background to BBT and review the available evidence for its effectiveness.	The Systematic Review, provides the background and evidence for BBT. A review of literature by way of PubMed (1966-2004), Embase (1966-2004), Cinahl (1982-2004) and Web of Science (1992-2004). Eligibility criteria were based on a Randomized Controlled Trial. Medication use, PEF, FEV_1, MV, $ETCO_2$, QoL, Symptom score, BHR, exacerbations, response to CO_2, were the outcomes used in Buteyko trials.	BBT is a complementary therapy that has been found by some to achieve this aim, but without any evidence of change in objective lung function measures, or bronchial responsiveness. Further work is needed to confirm or refute the idea that altering breathing patterns can really have a significant effect on this parameter.

Respiratory Medicine (2008)	A randomised controlled trial of the Buteyko technique as an adjunct to conventional management of asthma.[18] Robert L. Cowie[a, *], Diane P. Conley[a], Margot F. Underwood[a], Patricia G. Reader[b]	Aimed at assessing the efficacy of a nonpharmaco-logical intervention in patients with asthma on conventional therapy including inhaled corticosteroids.	A total of 182 subjects were screened for the study. Subjects aged between 18 to 50 years with asthma and current use of asthma medications were included. 53 subjects fell under exclusion criteria. The remaining 129 adults were randomized, 65 in the BBT group and 64 in the control group. They received their education in groups of 12 subjects for 5 consecutive evenings and the interventions were completed during a 6-week period. Outcome measures like, Asthma control questionnaire, QoL, Medication use, FEV_1 were noted and the subjects were contacted and reassessed at 3 months and at 6 months after completion of their intervention to determine whether their asthma was controlled.	The majority of subjects displayed control of their asthma with the additional benefit of reduction in inhaled corticosteroids use in the intervention group .

Egyptian Journal of Chest Diseases and Tuberculosis (2012)	Effect of Buteyko breathing technique on patients with bronchial asthma.[19] Zahra Mohamed Hassan[a], Nermine Mounir Riad [b], *, Fatma Hassan Ahmed [c]	To assess the effect of BBT on patients with bronchial asthma.	In this randomized controlled trial, 40 patients with bronchial asthma were included, 20 patients in the study group (BBT plus medications as prescribed by the physician) and 20 patients in the control group (No physical therapy program and only medications prescribed). Inclusion criteria were, 1] Patients would have been previously diagnosed with bronchial asthma 3 years ago or more. 2] The age of the patients ranged between 30 and 50 years old. Exclusion criteria were, 1] Previous instruction in the Buteyko Method. 2] Cardiac diseases. 3] Mental retarded patients. The program continued for 6 weeks (2 sessions per week except the 1st week was 4 sessions per week). PEFR, Control pause test and asthma control questionnaire were considered for outcomes at the beginning and after the treatment program for both groups.	It reduces the recurrence and incidence of the primary bronchial asthma symptoms (nocturnal awakening, morning symptoms, exercise limitation, shortness of breath, wheezing, PEFR percent expected, and Inhaled Corticosteroids). It also dramatically raises PEFR.

Gymnasium (2012)	The efficiency of the Buteyko method in improving the functional parameters in the bronchial asthma – case study.[20] Ochiană Gabriela[1] *, Ochiană Nicolae[2]	The purpose of the study was to prove the relationship between the major symptoms of asthma and hyperventilation .	In the study, research methods used were the cyrtometric index, the VEMS (FEV1), the Tiffneau index (FEV1/FVC), the Seva score as well as the TA, FC and the FR. At first, the research was carried out in a doctor's office and later at the subject's home, using only one subject. 7-year-old male, clinically diagnosed with: uncontrolled bronchial asthma. Moderate degree of obstructive ventilatory dysfunction. The duration of the physical therapy treatment using the Buteyko method was 3 months, with a frequency of 5 sessions a week, the duration of a session being approximately 30-45 minutes, 3 sessions a day.	We developed a connection between hyperventilation and the key symptoms of bronchial asthma that decreased (bronchospasm, cough, expectoration, nasal congestion) by using the Buteyko method. The practice of this technique is focused on increasing the patient's consciousness by lowering the breathing intensity and using superficial breathing;

International Journal of Medicine and Public Health (2015)	Effect of Buteyko breathing exercise in newly diagnosed asthmatic patients.[21] Prasanna K. B., Sowmiya K. R.[1], Dhileeban C. M.[2]	To note the improvement of symptoms in newly diagnosed asthmatic patients undergoing BBT.	The Randomized controlled trial includes a total of 100 patients who were newly diagnosed asthmatics. The study group were taught BBT and the control group were given Standard asthma treatment (inhaled corticosteroids). Patients of both sexes in the age group of 25 to 60 years were included, while smokers and chronic asthmatics were excluded. To assess the effects, outcome measures included a pretested close-ended Asthma Control Questionnaire, a pulmonary function test, and a peak expiratory flow meter.	There was a statistically relevant improvement in daily Asthma Management and PEFR in the Buteyko breathing exercise group compared to the control group after 2 months. It is possible to use the Buteyko breathing procedure as a key treatment tool in the management of asthmatic patients at the primary healthcare level with a healthy, equally effective, and inexpensive intervention.

DISCUSSION

Buteyko technique is a version of the Russian methodology that was first presented in Australia and is now utilised globally. It has the similar emphasis on ventilation management. The Buteyko technique would avoid the negative effects of steroids, enhance the patient's quality of life, and, most crucially, be outlay. In addition, patient compliance may be higher than with steroids.[22. 23]

The Buteyko Method highlights the importance of evolving and sustaining nasal breathing at all times, predominantly during exercise, sleep, and when the nose becomes blocked due to a cold or allergic reaction. It suggests that this is an important feature of asthma treatment, as it has been shown that substituting mouth breathing with nasal breathing improves lung capacity and reduces asthma exacerbations even though those breathing exercises are not present. Patients learning the Buteyko Method are taught to clear obstructed nasal passages through a combination of breath keeping techniques, such as a sequence of Control Pauses or a Maximum Pause while sitting or walking, to successfully clear the nose with breath-holding exercises, one must exercise drawing the first breath through the nose while keeping the mouth closed so a quiet breathing rhythm can be recommenced. Individuals with constantly plugged noses often report that the better they breathe through the nose, the smoother and more comfortable it gets.[6]

The Bowler et al. study found a 54% improvement on the quality of life scale after 6 weeks[7]. In a 2008 research conducted in Canada by Cowie et al, 129 individuals with asthma were randomly assigned to either a Buteyko practitioner or a chest physiotherapist to undergo a series of breathing exercises. The proportion of patients attaining satisfactory asthma control in the Buteyko group improved from 40% at baseline to 79% at 6 months[11]. Patrick McHugh et al. in his investigation found no change in forced expiratory volume. However, the experiment found no negative impacts from using the Buteyko regimen[9]. In a research conducted by Opat et al, the results showed a significant increase in quality of life among those who received the BBT over those who received a placebo. The purpose of this study was to see if the BBT, as presented in a video, is an effective asthma treatment[8].

Among the complementary and alternative medicine (CAM) approaches used in asthma treatment, BBT has received the most attention. Individual trials using BBT reliably demonstrated a decrease of asthma drug usage and, when combined with pulmonary physiotherapy, also demonstrated an increase in quality of life (QoL) and subjective perception of asthma symptoms. However, no substantial change in lung capacity was

observed in any of the BBT trials, which may account for the optimistic findings. It's also conceivable that the studies' ability to identify improvements in lung function parameters was inadequate. Large-scale experiments can show an impact. Studies that investigated the potential underlying mechanism in BBT discovered a substantial rise in end-tidal CO2 in the successful intervention arm.

Critics of BBT contend that medication reduction may be attributed to the clinicians' effect, which is impossible to assess. On the other hand, there was no suggestion of a detrimental impact on asthma management with reduced drug use, and symptoms may have improved to some degree. Longer follow-up is needed to demonstrate that the increase in asthma management as calculated by medication use is maintained over a clinically relevant period of time and that BBT has no adverse effects.

Despite the lack of evidence for physiological improvements that account for the reported results, a reduction in drug usage could be beneficial given the potential systemic consequences of ICS use.

CONCLUSION

In asthmatic patients, this study supports the efficacy of Buteyko breathing exercise above normal care. The reviewed literature shows that there was a statistically significant improvement in daily asthma control, asthma severity, pulmonary function-forced expiratory volume in one second (FEV1), and peak expiratory flow rate (PEFR) in patients who used BBT as an adjunct to normal care.

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