ORIGINAL ARTICLE

Use of the Buteyko method in the study of quality of life in asthma patients

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ABSTRACT

Aim: To evaluate the effectiveness of Buteyko breathing exercises as part of comprehensive asthma therapy.

Materials and Methods: A total of 52 patients with partially controlled moderate asthma were included in the study. Patients were divided into two groups: Group 1 received baseline asthma therapy, while Group 2 received baseline therapy combined with Buteyko breathing exercises. Treatment efficacy was assessed using respiratory function parameters, the SF-36 quality of life questionnaire, and the Asthma Control Questionnaire (ACQ) at baseline and three months after treatment.

Results: Patients receiving baseline therapy combined with Buteyko breathing exercises demonstrated greater improvement in respiratory function parameters compared with patients receiving baseline therapy alone. In Group 2, forced expiratory volume in the first second (FEV_1) increased from 59.31% to 72.11% after treatment ($p<0.05$). Improvements in selected domains of quality of life and asthma control were also observed following treatment.

Conclusions: The addition of Buteyko breathing exercises to baseline therapy was associated with greater improvement in respiratory function and selected quality-of-life parameters compared with baseline therapy alone. Buteyko breathing exercises may be considered a supportive adjunct to comprehensive asthma management.

KEYWORDS: asthma, Buteyko breathing, quality of life, pulmonary rehabilitation, respiratory function

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INTRODUCTION

Asthma is the most prevalent chronic respiratory disease and remains a significant global health concern, affecting millions of individuals worldwide. The global average prevalence of asthma ranges from 5% to 10% [1]. According to a systematic analysis from the 2021 Global Burden of Disease Study, asthma ranked 23rd among the leading causes of disability-adjusted life years (DALYs) lost [2]. Despite optimistic projections indicating a reduction in the global burden of asthma by 2050, based on age-standardised DALYs decreasing from 257 per 100,000 population in 2022 to 134 per 100,000 in 2050 [3], asthma remains the second leading cause of mortality among chronic respiratory diseases [4]. Current epidemiological data indicate a continuing increase in the prevalence of chronic respiratory diseases, including asthma. A systematic review conducted for the Global Burden of Disease Study reported that, in 2019, asthma affected approximately 262 million people worldwide (an age-standardised rate of 3,416 cases per 100,000 population), with an associated mortality of 455,000 deaths. Forecasting models suggest that by 2025, an additional 100 million individuals may be affected globally [5].

Asthma represents an important challenge not only in allergology and pulmonology but also in primary care practice. Current treatment approaches are primarily based on pharmacotherapy, particularly inhaled corticosteroids (ICS) and bronchodilators (beta-2 agonists) [6]. However, some patients show increasing interest in complementary therapeutic approaches, partly due to concerns regarding long-term steroid use [7]. Breathing exercises are among the most widely recognised complementary approaches used in asthma management and include techniques such as yoga, pranayama, capnometry-guided respiratory training, the Strelnikova method, slow breathing training, and Buteyko breathing exercises (BBE) [8]. These methods combine controlled breathing practices with elements of physical training. Their principal aim is to regulate breathing patterns and reduce hyperventilation. Breathing dysfunction associated with chronic hyperventilation may contribute to hypocapnia and accompanying psychological and physical symptoms, including anxiety and panic disorders. Previous studies have demonstrated that breathing exercises may reduce stress and anxiety, improve behavioural adaptation, enhance respiratory muscle function, and support respiratory rehabilitation in patients with asthma [9].

AIM

The aim of the study was to evaluate the effectiveness of Buteyko breathing exercises as part of comprehensive asthma therapy.

MATERIALS AND METHODS

We examined 52 patients with partially controlled moderate asthma. Patients were under outpatient follow-up and received a standardised baseline therapy consisting of inhaled budesonide/formoterol (160/4.5 μg), administered as two inhalations twice daily throughout the entire treatment period. The therapy was adjusted at the time of presentation, which was defined in the study as the initiation of treatment. No statistically significant differences were observed between the groups at baseline with respect to the studied parameters (Table 1). The age of the examined patients ranged from 21 to 47 years, with a mean age of 35.3±14.3 years (mean ± SD). Among the 52 patients, 42 (80.8%) were male and 10 (19.2%) were female. The duration of asthma ranged from 3 to 12 years, with an average duration of 5 years. The patients were divided into two groups: Group 1 (n=25) received baseline asthma therapy, while Group 2 (n=27) received baseline therapy in combination with Buteyko breathing exercises (BBE). Prior to the start of the study, patients in Group 2 underwent training in the Buteyko breathing technique. The breathing training focused on the regulation and awareness of the patient's breathing process.

The Buteyko breathing technique was implemented according to a standardized breathing retraining protocol described in previous studies [10], aimed at normalising breathing patterns through reduced breathing volume, nasal breathing, and controlled breath-holding exercises to correct hyperventilation.

The clinical efficacy of the treatment was assessed through objective examination and measurements of respiratory function, including forced expiratory volume in the first second (FEV_1) and peak expiratory flow rate (PEFR), as well as the Medical Outcomes Study Short Form-36 (SF-36) quality of life questionnaire and the Asthma Control Questionnaire (ACQ), administered at baseline and three months after treatment.

The study complied with current international and national bioethical standards and was approved by the Ethics and Bioethics Committee of Kharkiv National Medical University. Written informed consent to participate in the study was obtained from each participant.

The distribution of variables was tested for normality using the Shapiro–Wilk test. Variables with a normal distribution are presented as mean and standard deviation (M ± SD). To assess the statistical significance of differences between groups, Levene's test was first performed to evaluate equality of variances, confirming homogeneity between Group 1 and Group 2 ($p \geq 0.05$). For intergroup comparisons (Group 1 vs Group 2), the independent samples t-test was used. For within-group comparisons (before vs after treatment), the paired t-test was applied. Results were considered statistically significant at $p < 0.05$. In Table 1, p1 reflects changes within Group 1, p2 reflects changes within Group 2, and p3 reflects differences between Group 1 and Group 2 after three months of treatment..

RESULTS

The clinical study demonstrated that treatment with basic pharmacotherapy in combination with BBE in patients from Group 2 resulted in greater improvement in respiratory function parameters compared to patients in Group 1. Specifically, FEV_1 in Group 1 increased from 61.3±3.18% before treatment to 65.34±4.32% after treatment, whereas in Group 2 it increased from 59.31±3.32% at baseline to 72.11±4.32% following treatment. Thus, respiratory function parameters in Group 2 were significantly better than those in Group 1 after treatment ($p<0.05$).

Peak flow (PF) values were assessed individually for each patient over a two-week period prior to treatment. At admission, daily PF variability in Group 1 and Group

Table 1. Comparative parameters between the study groups before and after treatment

Parameter	Group 1			Group 2			
	Before treatment	After treatment	p_1-value (comparison within-group 1)	Before treatment	After treatment	p_2-value (comparison within-group 2)	p_3-value (comparison after treatment between-group)
FEV_1 (%)	61.3 ± 3.18	65.34 ± 4.32	p≥0.05	59.31 ± 3.32	72.11 ± 4.32	p<0.05	p<0.05
Physical activity (points)	36.2 ± 6.12	44.40 ± 5.61	p<0.05	35.3± 6.91	71.20 ± 6.23	p<0.05	p<0.05
Vitality (points)	38.70 ± 5.97	48.80 ± 6.51	p<0.05	36.21 ± 4.99	69.70 ± 5.33	p<0.05	p<0.05
Social activity (points)	39.81 ± 5.54	49.8 ± 4.98	p<0.05	41.22 ± 6.33	67.5 ± 4.88	p<0.05	p<0.05
Mental health (points)	43.24 ± 4.96	62.60 ± 5.12	p<0.05	45.33 ± 5.01	81.4 ± 6.11	p<0.05	p<0.05
ACQ score	2.08 ± 1.05	1.00 ± 0.121	p<0.05	2.11 ± 0.99	0.72 ± 0.13	p<0.05	p≥0.05

Group 1 – Basic pharmacotherapy, Group 2 – Basic pharmacotherapy + Buteyko breathing exercises, FEV1 – Forced expiratory volume in the first second, ACQ – Asthma Control Questionnaire, p-value – probability value

Source: compiled by the authors of this study.

2 was comparable, reaching 73±6.5% and 76.4±5.2%, respectively. After treatment, daily PF variability decreased to 32.1% in Group 1 ($p<0.05$) and to 24.5±1.8% in Group 2 ($p<0.05$) compared with pre-treatment values. Normal daily PF variability is considered to be <10%. Three months after treatment, morning PF values improved in both groups; however, greater improvement was observed in patients receiving baseline therapy combined with BBE ($p<0.05$).

The analysis of quality of life (QoL) showed that limitations in daily activities associated with health problems decreased 2.5-fold in Group 2 patients, compared with a 1.2-fold reduction in Group 1. General health status improved in both groups after treatment adjustment, reaching 58.34±1.30 points in Group 1 and 69.3±2.0 points in Group 2 ($p<0.05$). Baseline physical activity scores were 36±7.12 points in Group 1 and 35.3±6.91 points in Group 2. After 3 months, physical activity scores increased to 44.40±5.61 points in Group 1 ($p>0.05$) and to 71.20±6.23 points in Group 2 ($p<0.05$), indicating a statistically significant improvement only in Group 2.

Vitality indicators demonstrated a similar trend. Before treatment, vitality scores were 38.70±5.97 points in Group 1 and 36.21±4.99 points in Group 2. After 3 months, these values increased to 48.80±6.51 points in Group 1 ($p<0.05$) and 69.70±5.33 points in Group 2 ($p<0.05$). Social activity scores at baseline were 39.8±5.54 points in Group 1 and 41.22±6.33 points in Group 2. After 3 months, this parameter improved in both groups, reaching 49.8±4.98 points in Group 1 ($p<0.05$) and 67.5±4.88 points in Group 2 ($p<0.05$).

According to the questionnaire data, mental health indicators at baseline did not differ significantly between the groups and were 43.2±4.96 points in Group 1 and 45.33±5.01 points in Group 2 ($p>0.05$). After 3 months, mental health scores improved in both groups, reaching 62.60±5.12 points in Group 1 ($p<0.05$) and 81.4±6.11 points in Group 2 ($p<0.05$). Intergroup comparison after treatment demonstrated significantly better outcomes in Group 2, with values approximately 1.2-fold higher than those in Group 1 ($p<0.05$).

The level of asthma control assessed using the ACQ was 2.08±1.053 points in Group 1 and 2.11±0.99 points in Group 2 at baseline, indicating uncontrolled asthma. After treatment, symptom control improved in both groups, reaching 1.00±0.121 points in Group 1 ($p<0.05$) and 0.72±0.113 points in Group 2 ($p<0.05$). Patients in Group 1 achieved partial asthma control, whereas patients in Group 2 achieved full asthma control.

DISCUSSION

Studies have shown that timely adjustment of asthma treatment has a positive effect on lung function and reduction of bronchial obstruction. The positive effect of treatment adjustment on the average scores of the SF-36 and ACQ questionnaires highlights the importance of monitoring both the physical and mental health of patients.

Indicators of mental health, vitality, social functioning, and limitations in daily activities due to emotional problems improved in both groups compared to baseline ($p<0.05$). However, patients in Group 2 demonstrated greater improvement in physical activity, emotional status, self-regulation capacity, and social functioning compared to patients in Group 1 ($p<0.05$), supporting the potential role of breathing techniques, particularly Buteyko breathing exercises, as an adjunct to pharmacological treatment and pulmonary rehabilitation.

The findings of this study cannot be extrapolated to all patients with asthma, as not all individuals may be willing to engage in breathing training. Nevertheless, the use of Buteyko breathing exercises was associated with improvement in quality of life and asthma control in the examined patients.

Similar findings regarding the beneficial effects of breathing retraining on asthma control and quality of life in adults with asthma were reported by Bruton et al. [11].

The obtained results are consistent with findings from previous clinical studies, including studies involving children with asthma, which demonstrated beneficial effects of breathing exercises in asthma management and highlighted their role in pulmonary rehabilitation [12, 13].

CONCLUSIONS

Baseline therapy adjusted according to asthma severity was associated with improvement in selected respiratory parameters and quality-of-life measures. The addition of Buteyko breathing exercises was associated with greater improvement in respiratory function and selected domains of quality of life compared with baseline therapy alone. Buteyko breathing exercises may be considered a supportive adjunct to comprehensive asthma management.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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