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Buteyko Breathing Technique for asthma: an effective intervention

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Abstract

Aim To assess the impact of the Buteyko Breathing Technique (BBT) on medication use in asthma.

Methods A blinded randomised controlled trial comparing BBT with control was conducted in 38 people with asthma aged between 18 and 70. Participants were followed for six months following the intervention. Medication use and indices of ventilatory function were recorded.

Results No significant change in FEV_1 (forced expiratory volume in one second) was recorded in either group. The BBT group exhibited a reduction in inhaled steroid use of 50% and ß2-agonist use of 85% at six months from baseline. In the control group inhaled steroid use was unchanged and ß2-agonist use was reduced by 37% from baseline. Investigator contact between the two groups was equal. There were no adverse events recorded in either group.

Conclusions BBT is a safe and efficacious asthma management technique. BBT has clinical and potential pharmaco-economic benefits that merit further study.

Asthma is a common disorder in New Zealand, with estimates of prevalence as high as one in six of the population.[1] The annual cost of asthma drugs is high, with approximately $30 million spent in 2002 on inhaled corticosteroids and ß2-agonists.[2] Any intervention that reduces drug utilisation could have a major impact on pharmaceutical expenditure.2

Complementary and alternative therapies (CATs) are widely used by patients with chronic illnesses. CAT use amongst patients with asthma appears particularly high, with rates of up to 42% reported in some populations.[3] The range of CATs employed is wide; however, CAT research in asthma is characterised by a lack of adequately sized randomised controlled trials.[4]

The Buteyko Breathing Technique (BBT) is a CAT used by asthma patients that has enjoyed increasing popularity over recent years. One small, randomised controlled trial of the BBT showed marked reduction in asthma drug consumption among patients in Brisbane, Australia.[5] A further trial, based on the use of a BBT video has also demonstrated BBT is effective in reducing ß2-agonist use.[6]

We report a study that investigates the efficacy of BBT in a selected group of New Zealand patients.

Methods

Study participants General practitioners (GPs) were approached to send out a letter to practice patients with a diagnosis of asthma inviting them to participate in the study. A brief phone interview

was conducted, following which respondents were then booked for a pre-run-in interview where appropriate.

Respondents were eligible for inclusion if they were between 18 and 70 years old, previously diagnosed with asthma by their GP, and using moderate to high doses of medication for asthma. For the purposes of this study, asthma was defined as a history of variable difficulty in breathing with wheeze or chest tightness, and improvement after the use of a ß2-agonist. A 'moderate to high' dose was defined as at least 1400 mcg of short-acting ß2-agonist weekly (or equivalent long-acting ß2-agonist) and/or significant use of inhaled steroid medication (1400 mcg of beclomethasone or equivalent per week). This was measured over the last week of the run-in period. Dose equivalence was calculated as follows: 100 mcg of salbutamol = 25 mcg of salmeterol, and 100 mcg of beclomethasone = 100 mcg budesonide = 50 mcg of fluticasone[6].

Respondents were ineligible if they had experienced a change in inhaled steroid dose or used oral steroids during the four-week run-in period. Prior instruction in BBT or a significant unstable medical condition were also exclusion criteria.

Sample size calculation was based around the observed differences in medication use in the Brisbane study.[5] This indicated a requirement for approximately 20 participants in each group to demonstrate a statistically significant reduction in medication dosage, at a 95% confidence interval (CI) and 80% power to demonstrate such a difference.

The study had received prior approval by the Tairawhiti Regional Ethics Committee. Informed consent was obtained for all participants.

Intervention Participants were paired on the basis of severity of asthma. They were then randomised to either Buteyko or control group using a computer-generated list. Trial participants were blinded as to whether they had been assigned to the treatment or control group. Investigators involved in pulmonary function testing and other outcome assessments were blinded as to treatment assignment as were investigators who contacted participants during the study to advise re drug dosing.

Trial participants underwent training simultaneously in two separate groups. Teaching occurred over seven days with each session lasting 60–90 minutes. Participants were informed the trial involved two different forms of asthma education, both of which were thought to be useful in reducing reliance on medication and improving control of asthma.

A representative of the Buteyko Institute of Breathing and Health (BIBH), following their usual teaching practices, taught the BBT. BBT consisted of a series of exercises promoting hypoventilation. Control training consisted of general asthma education and relaxation techniques, as currently used by Gisborne Hospital.

The tutors contacted participants in both groups one week after conclusion of the final teaching session. Participants were instructed to contact their tutor thereafter whenever they wished. If contact occurred, the matched participant in the other treatment group was telephoned by their tutor to control for frequency of contact.

Outcome measures Over a four-week run-in period participants completed a diary card recording symptom scores (0 = no symptoms, 3 = maximal symptoms) and daily use of asthma medication. Four-week diary cards were also completed prior to the six-week, three-month and six-month assessments. Baseline spirometry was performed at the end of the run-in period and repeated at the three-month and six-month assessments.

Participants were seen for review six weeks into the trial. Medication use was reviewed and where appropriate advice was given to adjust dosages. At every contact, participants were reminded to use ß2-agonist only when symptomatic. After the six-week review, all participants were contacted where possible by phone every three weeks, medication reviewed and appropriate advice given. Dosage reduction protocol described in the Brisbane trial was utilised.[5]

Results

Participants Nineteen GPs agreed to send out letters to patients with asthma registered with their practices. There were 64 respondents to the letter of which 51 met initial inclusion criteria. Subsequent to a face-to-face interview, two were excluded due to having unstable medical conditions, six were excluded for insufficient medication/treatment use during run-in and five were excluded after using

oral steroids during run-in. After the run-in period, 38 participants were allocated equally between each group. Four withdrew after allocation and prior to completion of the teaching, leaving 34 available for evaluation.

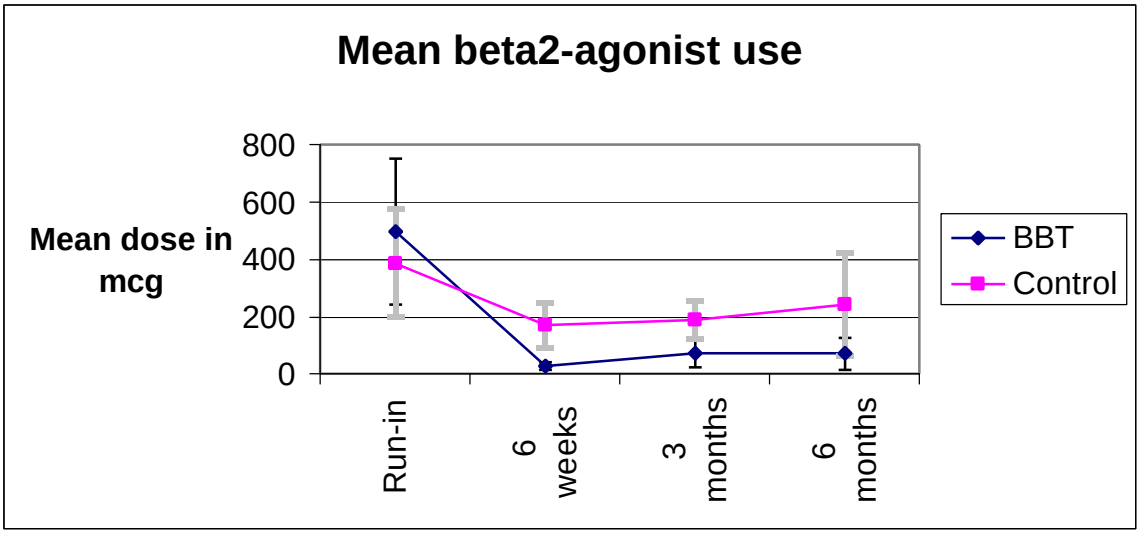
Demographic characteristics, smoking status, medication use, asthma symptom score and asthma severity at baseline are indicated in Table 1. There were no significant differences between the BBT group and the control group on the basis of age, asthma symptom score, ß2-agonist dose or inhaled steroid dose. The BBT group had a significantly lower percentage predicted FEV_1 at end of run-in ($p = 0.038$).

Table 1. Characteristics of participants at end of run-in period

	BBT group (n = 17)	**Control group (n = 17)**
Gender (male:female)	4:13	4:13
Mean age (range)	48.8 (24–69)	44.0 (18–66)
Non-smokers:ever smokers	11:6	12:5
Mean daily adjusted ß2-agonist dose (expressed in mcg equiv ß2-agonist +/- SD)	496 +/- 519	386 +/- 399
Mean daily adjusted inhaled steroid dose (expressed in mcg +/- SD)	909 +/- 881	896 +/- 502
Mean daily symptom score +/- SD (0 = no symptoms, 3 = maximum symptoms)	1.08 +/- 0.42	0.99 +/- 0.50
% predicted FEV_1 +/- SD	70.8 +/- 16.3	82.7 +/- 16.2

ß2-agonist use Figure 1 illustrates ß2-agonist use by group.

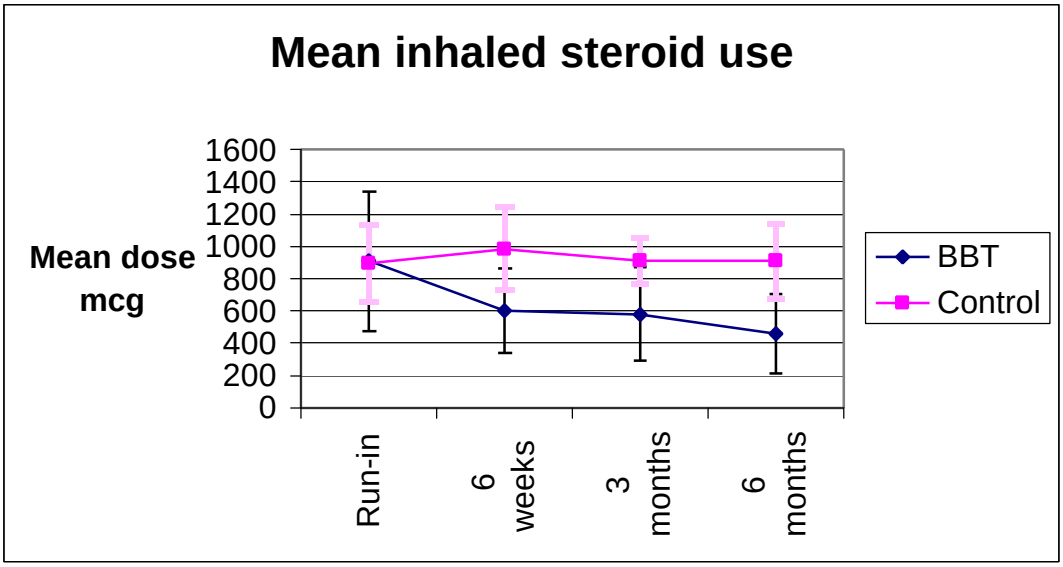
Figure 1. ß2-agonist use by group (with 95% CI)



At baseline, there was no significant difference in mean ß2-agonist use between BBT and control. At six weeks, both groups showed significant reduction in ß2-agonist usage from baseline (BBT p = 0.001; control p = 0.020). The reduction in usage in the BBT group was greater than that in the control at six weeks (BBT 94% reduction, control 56% reduction, p = 0.001) and three months (BBT 86% reduction, control 51% reduction, p = 0.007); however, by six months the difference was no longer statistically significant (BBT 85% reduction, control 37% reduction, p = 0.102).

Inhaled steroid use Figure 2 illustrates inhaled steroid use for the two groups.

Figure 2. Inhaled steroid use by group (with 95% CI)

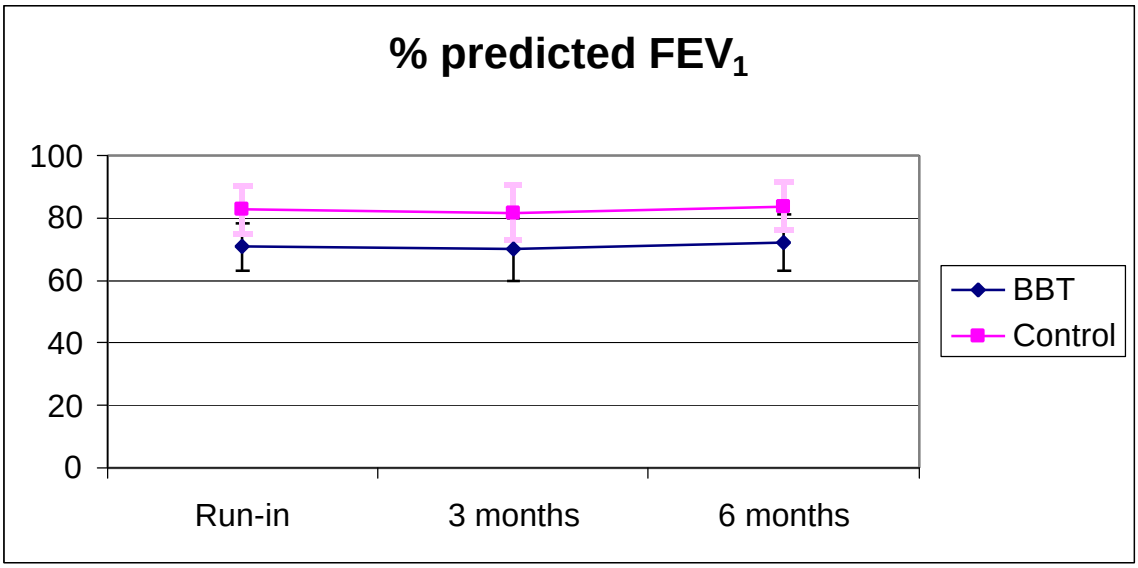


Mean inhaled steroid use was the same at baseline for both groups. At six weeks (BBT 34% reduction, control 10% increase, p = 0.032), three months (BBT 36% reduction, control 2% increase, p = 0.011) and six months (BBT 50% reduction, control 1% increase, p = 0.003), there was a significant reduction in inhaled steroid use in the BBT group that was not observed in the control group.

Percentage predicted FEV_1 Percentage predicted FEV_1 for both groups is illustrated in Figure 3.

Percentage predicted FEV_1 was statistically significantly lower in the BBT group at end of run-in. This difference became non-significant at three months and six months. There was no significant change in percentage predicted FEV_1 in either group during the study.

Figure 3. Percentage predicted FEV_1 by group (with 95% CI)



Adverse events There were no admissions to hospital or attendances at ED for any participants in the trial during the trial or during the 12-month period following completion of the study. Three control and two BBT subjects received short courses of prednisone during the six months of the post-instruction trial period.

Phone contacts The instructor contacted all participants once one week after completion of the intervention. After completion of instruction, only three patient-initiated contacts were recorded; two from BBT group participants and one from a control group participant. On these occasions, the matched-pair partner of the participant was contacted by their instructor. Phone contacts between participants and their respective tutors and between participants and the investigators were the same for the BBT and the control groups.

Discussion

This study broadly replicates the findings of Bowler et al.[5] BBT as taught by a member of BIBH was observed to produce a large clinically significant reduction in ß2-agonist and inhaled steroid use without negative impact on measures of lung function and with no apparent adverse effects.

The study by Bowler et al demonstrated inhaled steroid reduction of 49% for the BBT group and 0% for the control group at three months.[5] The current study exhibited inhaled steroid reduction of 50% in the BBT group and a 1% increase for the control group at six months.

With regards ß2-agonist use, Bowler et al demonstrated a 95% reduction in the BBT group and a 7% reduction in the control group at three months. Our study showed a reduction of 85% in the BBT group and a reduction of 37% in the control group at six months. The magnitude of effect in both studies was remarkably similar.

The experimental design of this trial controlled for the inequality of investigator contact, which was criticised in commentary on the Brisbane trial.[7,8] In the current

trial post-intervention phone contact in both BBT and control group by the tutor was minimal and equal. The similarity in results between the two trials suggests that factors other than contact bias were operating to produce the observed results. It is noteworthy that the dose reductions observed in this investigation were durable, persisting up to six months post-intervention. This represents the longest follow up yet reported of a BBT intervention.

There is no universally accepted diagnostic criterion for the diagnosis of asthma.[9] Therefore patients with a GP-assigned diagnosis of asthma with a confirmed background of variable difficulty in breathing and symptomatic relief following ß2-agonist use were chosen, as they form a valid and relevant study population.[10] Within this group of patients there may be considerable heterogeneity, including patients whose primary problem may be dysfunctional breathing.[11]

Although investigators were blinded to treatment assignment, the use of the term Buteyko was allowed with participants assigned to that group. This is in contrast to the practice of Bowler et al, although in that study participants were aware at recruitment that the trial was a trial of BBT.[5] It was considered that use of the term would not unduly bias results, and was preferable to unrealistic efforts to maintain complete blinding.

The ability to produce marked reductions in asthma-drug utilisation suggests that the pharmaco-economic implications of BBT merit further study. Clarification of the mechanism(s) underlying the effectiveness of BBT is a further goal,[12] given that BBT appears to represent a safe, efficacious alternative for the management of asthma.

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