

AIRNERGY REPORT

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Dr Nyjon Eccles BSc MBBS PhD MRCP
The Chiron Clinic, Harley St, London, England W1G 6AX
Tel: 0207 2244622

Abstract

Six volunteers were recruited for a study of the effect of 4 sessions of 20 minute Airnergy sessions on various physiological parameters, namely Heart Rate Variability (HRV), Respiratory function in 2 asthma sufferers and Live blood morphology.

There was a significant expansion of the total HRV power during autonomic nervous system challenge indicating a positive effect on physiological reserve capacity. Both asthmatics demonstrated a 20% improvement in Peak Expiratory Flow Rate (PEFR) and improved subjectively. There was a consistent increase in white blood cell activity in all subjects as observed on Live Blood Microscopy but with one exception, no change in red blood cell morphology.

Introduction

Airnergy is a new process of oxygen therapies whereby the oxygen content of the air is activated by a means of Chemo-luminescence. It is thought that in this state the oxygen is more available for biological processes. Heart rate variability (HRV) is based on the time difference between each heart beat (R-wave) i.e. the beat-to-beat variability and is a useful non-invasive measure of autonomic nervous system balance but more importantly an indicator of the body's reserve energy and its capacity to respond to challenge. There has been unpublished research (Knopp, 2003) demonstrating that Airnergy can produce an improvement in HRV of 34% after only 20 minutes of treatment. One of the characteristics of a healthy physiological system is greater response potential to challenge and this result would suggest that in such a position the system would be better able to respond to and compensate for physiological stress and in general have better performance. The aim of this small study was to try to replicate the above findings with HRV and to look for other evidence of improved physiological performance.

Objectives

To examine the effects of 4 days consecutive 20-minute treatments in 6 subjects using the Airnergy Professional Plus apparatus on several physiological parameters of health and wellbeing. These included live blood morphology, heart rate variability and respiratory function.

Methods

Six volunteers were recruited to take part in the trial. Four were female associates, 1 was a male associate and the last was recruited by way of a PR agency and was known to be an asthma sufferer. With the exception of 2 of them who had mild and moderate asthma, the volunteers were not known to suffer from any medical condition and were not taking any regular medications. Subjects were assessed in the following 3 ways:

- 1) By Live blood analysis, to look for any visual effect on red blood cell morphology and white blood cell activity.

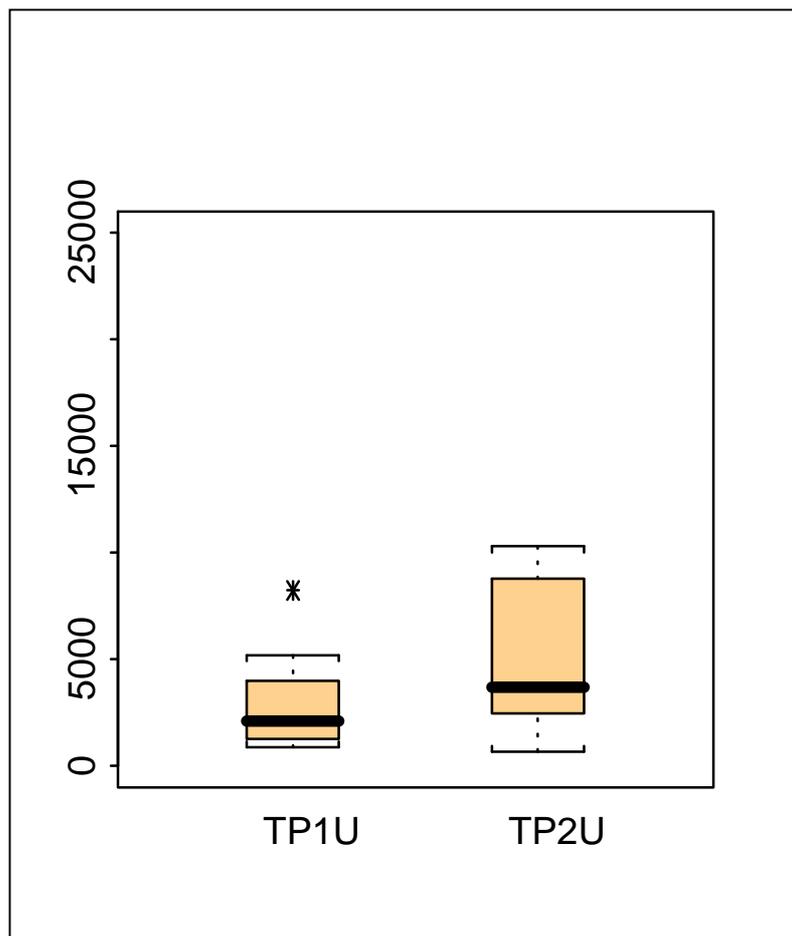
- 2) Heart rate variability (measured by *Nerve Express*), to observe any effect on autonomic nervous system function and adaptability
- 3) Respiratory Function Tests, including Peak Expiratory Flow Rate (PEFR), Forced Expiratory Volume at 1 second (FEV1) and Forced Vital Capacity (FVC). These tests were only performed on the 2 patients with asthma.
- 4) Subjective effects

HRV equipment was only available for the days 2 and 3 of the 4-day study. Two of the volunteers were asthma sufferers, one with mild asthma using only a salbutamol inhaler as required and the other with mild asthma and hayfever (to grass pollen) required regular inhaled steroids. On days 1 to 4 subjects had a spot of blood taken from a fingertip with the aid of a lancet. This was repeated before and after 20 minutes (set at 100%) of Airnergy (Airnergy Professional Plus) treatment by way of nasal cannula. On 2 days all subjects had their HRV assessed both in the supine and upright positions by way of the *Nerve Express* apparatus before and after AE treatment. In addition, the 2 asthma sufferers had lung function assessed as indicated above.

Results

Average age of the 6 volunteers was 43.2 with a range of 27-59. There were 5 females and 1 male.

Heart Rate Variability



TP1U = Total Power upright before Airnergy treatment,
 TP2U = Total Power upright after Airnergy treatment

Total power is a measure of the amount of nervous system activity that is available, similar to the amount of charge in a battery. In the face of challenge to the autonomic nervous system (in this case on standing from supine position to upright) there was a significantly ($p < 0.04$) greater amount of total power in the system after 20 minutes treatment with Airnergy than before treatment. See Appendix for further graphs and measurements.

Respiratory Function

<i>Subject</i>	<i>PEFR (l/min) Before AE</i>	<i>PEFR (l/min) After AE</i>	<i>FEV1 (litres) Before AE</i>	<i>FEV1 (litres) After AE</i>	<i>FVC (litres) Before AE</i>	<i>FVC (litres) After AE</i>
<i>ME</i>						
<i>Day 1</i>	286	345				
<i>Day 2</i>	279	328	2.08	2.19	2.22	2.20
<i>Day 3</i>	219	206	1.80	1.46	2.65	2.09
<i>JK</i>						
<i>Day 1</i>	412	436				
<i>Day 2</i>	468	505	3.67	3.72	4.18	4.16
<i>Day 3</i>	517	519				

In connection with the above formal measurements the following comments were made by the 2 subjects involved:

ME, aged 38, female, mild asthmatic using bronchodilators on average 4 to 5 times per day.

Comments:

Not having to use bronchodilator as much during the days of treatment. Only needing to use bronchodilator once a day during the trial.

JK, aged 28, female, mild to moderate asthma and hayfever, on regular inhaled steroids and bronchodilators twice per day.

Comments:

Breathing easier during night after first treatment, did not need bronchodilator. Breathing better on waking after first treatment when she would normally require bronchodilator. Before third treatment had felt a little wheeziness and chest tightness during the day due to hayfever but after treatment experienced a clear chest with the disappearance of the chest tightness. Subject had had fragmented sleep for 3 weeks prior to the trial but slept well for 3 days during the trial.

Live Blood Analysis

(Red blood cell morphology and white blood cell activity)

<i>Subject</i>	<i>General Observations</i>	<i>Red Cell Morphology</i>	<i>White Cell Activity</i>
DB <i>Age 59</i> <i>Female</i>	Grade 1 to 2 rouleaux No white cell cytoplasmic streaming or movement	No change	Day 2 and 3 – no change. By Day 4 there was clear cytoplasmic streaming and movement.
AP <i>Age 56</i> <i>Female</i>	Grade 1 to 2 rouleaux No white cell cytoplasmic streaming or movement	No change	Day 2 to 4 both cytoplasmic streaming and movement were observed
BM <i>Age 35</i> <i>Female</i>	Grade 1 to 2 rouleaux No white blood cell cytoplasmic streaming or movement	No change	Day 2 to 4 white cell cytoplasmic streaming was prominent.
ME <i>Age 38</i> <i>Female</i> <i>Asthmatic</i>	Grade 1 to 2 rouleaux White blood cells static	No change	Day 2 – no change. Day 3 – cytoplasmic streaming before and after treatment. Day 4 streaming after treatment only.
JK <i>Age 28</i> <i>Female</i> <i>Asthmatic/</i> <i>Hayfever</i>	Grade 2 rouleaux. White blood cells static.	Day 2 and 3 - no change. Day 4 - noticeably much less red cell rouleaux (Grade 1)	Day 2 – cytoplasmic streaming seen. Increased immediately after treatment. Day 3 – Static white cells before treatment with increased streaming and movement after treatment. Day 4 – Streaming and movement before treatment with increases in both after treatment.

Rouleaux = Red blood cell clumping. Grade 0 = no rouleaux, Grade 1 = a few random red cell clumps, Grade 2 = prominent red blood cell clumping, Grade 3 = red blood cells mainly in rouleaux. White blood cells: **Cytoplasmic streaming** refers to visible movement of granules within the cytoplasm. **Movement** refers to clear pseudopodic active and progressive movement.

Other Subjective results

(Each statement was made by a different subject)

Fatigue noted after first treatment. Some dizziness, tiredness, headache and disconnected feelings with subsequent treatments.

Hayfever symptoms stopped, no sneezing due to cat fur allergy whilst on the trial. Less nasal irritation. Much more energy noted.

Sleepiness after first treatment. Sometimes awakes with headache but during trial no usual headache and consistently much deeper sleep.

After first treatment increased urinary frequency and bowel movement noted. This did not persist. Much more energy noted thereafter.

Discussion and Conclusions

Six subjects of average age 43.2 (range of 27-59) were investigated to determine the effect of the Airnergy treatment given for 20 minutes on 4 consecutive days. Heart rate variability (HRV) is a useful non-invasive measure of autonomic nervous system balance but more importantly an indicator of the body's reserve energy and its capacity to respond to challenge. HRV was observed to improve significantly ($p < 0.04$) in the presence of autonomic nervous system stress after Airnergy treatment. This was manifest as an increase in the total power measured in the autonomic nervous system. This finding suggests that Airnergy was somehow able to increase the reserve capacity of the autonomic nervous system. Increased flexibility and dispersion in autonomic nervous system is consistent with an enhanced capacity to handle physiological stress.

Two of the 6 subjects were asthma sufferers. In one, there was a 20% increase in peak expiratory flow rate (PEFR) immediately after treatment and in the other a cumulative increase in PEFR with each treatment reaching a 26% increase at the end of the 4 treatments. There did not appear to be any changes in Forced Expiratory Volume in 1 second (FEV1) or Forced vital capacity (FVC) in either subject. Both subjects felt that their breathing improved during the treatments and both realised a reduction in the need to use their bronchodilator inhalers. The finding that PEFR increased would argue that the treatment was doing something to reduce airway resistance. A further study is needed in order to ascertain the exact mechanism of this action.

Finally, an interesting observation was made on live blood microscopy. One subject who had particularly prominent red blood cell rouleaux had a noticeable reduction of this phenomenon after 3 treatments. In the other subjects there was no observable effect on red blood cell morphology. In all subjects however, there was a tendency towards increased white blood cell activity after successive Airnergy treatments. This was particularly noticeable as most subjects began the trial with static white blood cells demonstrated by absence of cytoplasmic and cell membrane movement. It is not clear what the significance of this finding is or whether this would represent better immune competence "in vivo". A further study to measure specific markers of immune cell activity before and after Airnergy treatment would be indicated to test this hypothesis.