



Halotherapy and Buteyko Breathing Technique – a possible successful combination in relieving respiratory symptoms

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ABSTRACT

Speleotherapy and halotherapy are relatively old therapeutic methods sometimes recommended for chronic obstructive disorders. As part of rehabilitation programs, the need to introduce a natural approach on patient already receiving classical therapy seems to improve their clinical status as well as their quality of life. Buteyko breathing technique has known benefits in pulmonary rehabilitation and it is used to improve respiration and control chronic respiratory symptoms as part of respiratory exercising. In this short study we assessed the improvement of the control pause – a parameter used in Buteyko breathing exercising on patients receiving halotherapy for a day. The results showed a small improvement in their control pause, meaning that halotherapy, combined with Buteyko breathing technique may be a solution to enhance the respiratory status of chronic respiratory patients.

KEYWORDS : halotherapy, Buteyko, control pause, chronic respiratory patients.

Introduction

Halotherapy is a well-known natural therapy using NaCl aerosols for the relief of respiratory symptoms. Although the method has been known for centuries, the actual scientifically proof of the NaCl aerosols has been first documented by Felicz Bockowski in 19th century by observing the health of miners working in the salt mines (1).

NaCl aerosols resulted from natural sources are poly-dispersed systems with special nano-structural properties that have a different distribution and concentration within the environment - resulting a different environmental activity depending on temperature, humidity and probably the most important factor – the source (2). Many authors have theories about the efficiency of NaCl sources on respiratory symptoms relief, some claiming that natural saline environments – such as salt caves and natural formed halo-chambers are more efficient, others considering that a controlled saline environment – such as aerosoling devices are more efficient. Considering the difficulty of conducting a clinical study in a natural halo-chamber and multiple biases that can occur, it is pertinent to affirm that the conclusions of the scientific data collected from studies, conducted with artificial saline sources, provide enough evidence that a controlled NaCl aerosols emitting device is at least as efficient as any natural halo-chamber, and also safer and more accessible.

All areas are kept moist by airway mucus production - produced by mucous cells in the airway epithelial layer and submucosal glands in partially. This secretion (3) captures and encompasses particles in the air we breathe, preventing reaching and deposited in the airways and alveoli.

Buteyko technique is known to be responsible for reducing by 90% the use of rescue medication in asthma and up to 30% of background medication (4). Dr. Buteyko brought together as "diseases of civilization" diseases such as: allergies, asthma, COPD, fibrosis (asbestoses, silicosis, anthracnose, etc).

The common cause of these diseases is, after Dr. K. Buteyko, alveolar hyperventilation or breath deeply unjustified. In the 80s, he proposed to study a simple, respiratory dimming or "normalization" respiratory rate as physical exercise in patients with pulmonary pathology.

Based on the theory that there is a certain tolerability of CO₂ produced as a resultant oh human body metabolism he defines normal respiration as a balanced equilibrium between the

production and the disposal of CO₂. Thus, he states that breathing more results in insufficient elimination of CO₂ and therefore disruption of metabolism.

Materials and Methods

The known mechanism of halotherapy are: boosting local immunity in the respiratory system (by phagosomal acidification), bacteriostatic effect of the Chloride ion, increased mucociliary clearance (by osmotic mechanisms and thinning of the secretions), anti-inflammatory effect and local hypo-sensitization.

The film of mucus is constantly renewed due to the kinetics of ciliary epithelium - performing cilia movement of "sweeping" with a frequency of 10-20 times / second by moving to the throat mucus layer at a rate of about 1cm / minute. This mucus containing particulate matter captured (which can be bacterial inclusions) is subsequently removed by coughing or swallowed. This mechanism is added nasal turbulence due to its efficiency particle diameter no larger than 5 microns can penetrate the lungs (3).

In the light of this theory, the Buteyko technique uses a new parameter – named, "the control pause" – a method of measuring the rough tolerance of CO₂. The control pause basically means the amount of seconds that a subject can hold his breath after a full expiration, Buteyko linking this capability proportional to the CO₂ metabolism and respiratory disorders by stating that a lower control pause is associated to a lower control of the respiratory disorder (5).

Considering these two alternative medicine methods used in relieving respiratory symptoms, we proposed a trial in order to determine if using halotherapy for 20 minutes a day modifies the control pause of clinical healthy subjects, thus raising the probability of improving the Co₂ metabolism.

We selected 33 subjects, 22 males (all smokers) and 11 female (non smokers), about the same age, and we assessed the initial control pauses before halotherapy (Table 1).

For these subjects we assessed the peripheral oxygen saturation (SaO₂) and calculated a mean for each gender group (M – male group, F – female group), the mean cardiac frequency (bpm – beats per minute) and mean control pauses.

After using a clinical tested Dry Salt Inhaler for 20 minutes (nasal breathing through the inhaler), we assessed the control pauses of the subjects again.

Gender	Mean Age	Smoking status	Initial Pulsoxymetry		Initial Control Pause	After HT Pulsoxymetry		After HT Control Pause
			Mean SaO2	Mean Cardiac Frequency	Mean Values	Mean SaO2	Mean Cardiac Frequency	
M	35	yes	97%	92	22,82"	97%	89	27,55"
F	32	no	97%	72	28,44"	99%	71	32,53"

Table 1. The data collected from the subjects before and after using halotherapy (HT). SaO₂ – peripheral saturation in oxygen measured by pulsoxymetry.

Results

The results centralized in Table 1 showed a significant improvement of the control pauses of all three subjects but the most important aspect, it seems that the smokers had a better control pause after using halotherapy than the non-smoker.

The average improvement of the control pause was by 20% - 4,73 seconds in the male group showing significant improvements of the smokers, comparable with the non-smoker – female group 4,09 seconds – 14%.

We observed also a decrease in mean cardiac frequency – male group scored a mean CF of 89 bpm and female group had a mean CF of 71 bpm.

Conclusions

Although the tests were ran on a very small group, the results are promising and open the way to a more complex and extended clinical trial to be conducted on healthy subjects as well as on patients with obstructive respiratory disorders.

Halotherapy seems to improve the control pauses of healthy subjects after a 20 minutes cure, accented in smokers, but implications on CO₂ metabolism and further long-term benefits on respiratory function needs a more extensive clinical study with the assessments of CO₂ arterial levels in dynamics.

Discussions:

In a 1993 publication, Dityatkovskaya et al., Cited in the publication "Respiratory Diseases for Halotherapy" (6), researchers observed a significant decrease in IgE effect and improved humoral and immune status of patients bronchial cells with asthma who were doing and meetings halotherapy inside mines. Notable observation is the same researchers confirmed an increase in mucociliary clearance and an increase ciliary movements in the same patients.

Another important aspect of halotherapy is the ability to reduce the chance of respiratory infections by default bactericidal effect of Cl⁻ ion and by activating phagocytosis. This is an important benefit for patients with COPD exacerbations infectious as life threatening danger. As more and more studies are trying to elucidate and demonstrate the exact action mechanism of saline aerosols on the human respiratory system, the halotherapy gets the attention of more and more doctors and patients (3).

Another important technique used in relieving respiratory symptoms is the method attributed to the Ukrainian researcher and doctor Konstantin Buteyko. The Buteyko method or Buteyko Breathing Technique is a form of physical therapy, first formulated in 1950 by dr. Buteyko, that proposes the use of breathing exercises as a complementary treatment for asthma symptoms as well as other conditions (7). Although downgraded from evidence A to evidence B in GINA 2015, the asthma management guide still lists the breathing exercises as important tools of helping the patients achieve normal functioning.

The technique uses the principle that hyperventilation and subsequent or coexisting hyperinflation during an asthma attack is an endless feedback loop that eventually leads to increased CO₂ metabolism disturbance.

In 2006, Russian Breathing Center stated that the procedure is the most effective non-pharmacological management of asthma and respiratory pathology generally practiced so pulmonologists, pediatricians and free – professionals. It consists of a series of lectures and exercises that revolutionizes the concept of "Respiratory Physical Education"

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