

SPELEO-KINESIOTHERAPY

Neli Claudia Bîlha^{1,2}

Ştefan Bîlha³

Andrei Bîlha³

¹*Ştefan cel Mare University of Suceava, Romania*

²*County Hospital Suceava, Pneumology, Romania*

³*University of Medicine and Pharmacy „Gr. T. Popa” Iaşi, Romania*

Key words: speleotherapy, kinesiotherapy, general remodeling.

Abstract: The use of the therapeutic qualities of the microclimate from salt mines and the association with physical activity is realized from time to time, spontaneously or in an organized manner. The study comprises of an eclectic group (n=20) which took part in a rehabilitation program in the Cacica salt mine, Suceava County, for 3 weeks. A series of parameters that could have been influenced by the microclimate as well as by other therapeutically significant factors were analyzed. Speleo-kinesiotherapy is an example of general remodeling in rehabilitation, concept that we have introduced in 2010.

Introduction

Patients with chronic respiratory diseases benefit of advantages of Salt Mine Underground Rehabilitation and Treatment. In Romania, Dr. Gh. Simionca (1) and Dr. Ioan Ieţcu (2) realise the transition “from empiric to scientific speleotherapy”.

In 2010, we introduced the concept of General Remodeling in rehabilitation (3,4).

At the end of 2011 – the study with patients in Cacica salt mine. In 2012 was realized the license paper *A holistic approach: Salt mine therapy and Kinesiotherapy* (5). Holism – concept which supports the principle of the whole over the parts and of its irreducibility to the sum of the components. *Mens sana in corpore sano!* (Decimus Junius Juvenal, roman poet, 60-140) – this maxim is an example for holism, for the harmonious mind-body unity.

We are late in finding out that the human being consists of **soul, mind and body**. The body has a **material/anatomical** component, deeply studied in the occidental laboratories, and an **energetic** component which is known for millenniums by the oriental traditional medicine, but only recently the allopathic doctors have integrated this reality. The

rehabilitation itself, in a similar manner, reunites multiple subtle components, of which some are considered implicit and aren't mentioned.

A basis of remodeling could be represented by the **water** contained in the body. It is an interesting perspective the one that water could be the intelligent entity of Terra, and the people – one of its forms of manifestation. The water modulates *in vitro* its structural organization depending on sentiments, emotions, words, musical genre, etc. which was demonstrated experimentally. How much more subtle and spectacular can be the remodeling *in vivo* of “biological” water under the pressure of a complex endeavor of recovery. Adding to this, **physical activity** determines the release of mediators which induce a state of well-being, of happiness. Positive feelings, **optimism, eliminating stress** are universal therapeutic means and – together with **a healthy diet** – guarantee sanogenesis. The harmony of soul, mind, body. The quality of DNA ameliorates. *Homo faber* can remodel himself. **Self-healing** is the solution, the activation of individual regulating mechanisms. To this purpose, the doctor who is receptive to the inexhaustible therapeutic arsenal which exists in the world can nuance and individualize the therapeutic propositions, thus working together with the patient toward healing. An example of therapeutic intervention is represented by **salt mine therapy**.

Salt mine therapy, speleotherapy represent complex therapeutic influences on persons which deliberately descend in salt mines to benefit from the special underground environment, especially of the saline aerosols on the respiratory apparatus.

We integrate this study in *The Paradigm Evidence-based Medicine and Kinesiotherapy* (6).

Even the structure and functions of DNA can be positively influenced (*Murakami K, 2004, Sage JA, Lipton B*). The genes expression and the experience are mutual relationship. DNA commands the proteins synthesis and the mRNA is like an ON/OFF switch mechanism.

The process of rehabilitation is based on:

1. Physical Effort
2. Psycho-social Factors
3. New Actions
4. Profound respiration exercise
5. The Faith, etc.

All of these factors will be utilize in our program.

Material and Method

The study analyse the effects of speleotherapy in Cacica salt mine for 20 subjects.

The group was eclectic: children (two of ages 5 and 7 year-old) and adults (till 68 year-old), the mean age was 43. The sex ratio is 7 feminine (35%)/13 masculine (65%) subjects. The BMI (Body Mass Index) was between 14 and 32.5 with average 27.75.

The patients had mild pathology, chronic or episodic. It is necessary to be in good shape to be able to descend and climb back up the 75m be stairs to and from the underground. These persons were capable of climbing the almost 279 steps to the surface every day.

The daily number of participants varies (various reasons: health, professional, etc.), but the attendance was very good, with an average of 14 out of the 19 days total.

The suggested program was respected: 3 weeks, 2-3-4-3-2 hours/daily, *crescendo* and *decrescendo*.

Cure factors:

- Natural environment (7)
- The geographical location, the landscape and the microclimate
- The underground temperature – approximately 10 degrees C
- Radon radioactivity (8)
- Saline aerosols, supplemented in the gallery. At Cacica, Mr. Ec. Cornel Zup, manager, has added crushed salt to the floor of the gallery in which the patients spent their time and followed the program.
- The humidity
- Hydrocarbons inherent to salt mining /pleasant for some, „therapeutic” factor
- Compulsory physical activity: descending, climbing of over 279 steps to 75m deep and back (20-25 minutes x 2).
- The fixed schedule
- Complex group interactions: multiple professions, different ages.
- It was permanently a positive psychological climate.

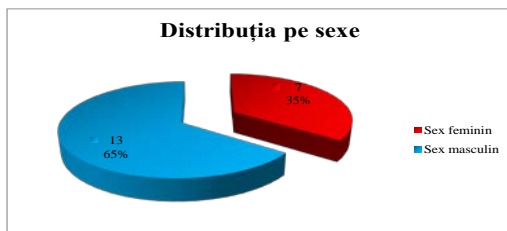


Fig. 1 Distribuția pe sexe

Figure no. 1. Sex ratio

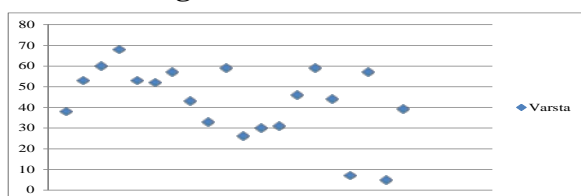


Fig. 2 Vârsta medie=43 de ani, cu extremele: 5 ani, 68 ani

Figure no. 2. Average age=43 years, extreme values: 5 and 68 year-old

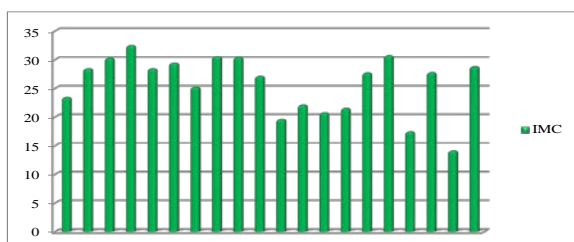


Fig. 3 IMC cuprins între 14 și 32,5, cu o medie de 25,75

Figure no. 3. BMI between 14 and 32.5, with an average of 25.75

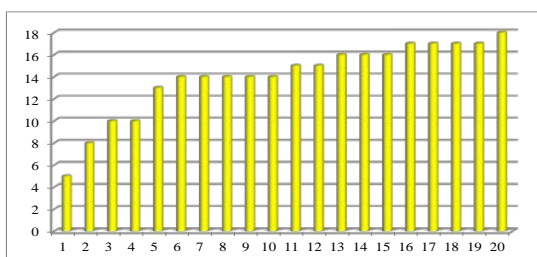


Fig. 4 Participarea a fost foarte bună, cu o prezență medie de 14 zile din 18

Figure no. 4. The attendance was very good, with an average of 14 out of the 19 days total

Kinesiotherapy: respiratory gymnastics, synthetic exercises, for slimming, tonifying, sport activities etc.

Physical effort effects confirmed the literature findings:

- Vitality increased explained by neurogenesis, neuroplasticity (*Von Praag, Kempner Mann, 2002*), bone remodelling („Utah Paradigm”, *Frost H, 1960, Wolff J, 1900*), muscle remodeling,
- Cardio-respiratory remodeling,
- Nervous and endocrine adaptation,
- Release of mediators that induce a state of wellbeing, of happiness (9).

Exercise as a treatment for inflammation:

- Regular physical activity is reported to decrease markers of inflammation
- Long-term chronic training may help reduce chronic low-grade inflammation.
- Low-intensity training can reduce resting pro-inflammatory markers (CRP, IL-6).
- There is a strong relationship between exhaustive exercise and chronic low-grade inflammation (Pedersen BK, Hoffman-Goetz L. *Exercise and the immune system: regulation, integration, and adaptation. Physiol Rev.* 2000 Jul;80(3):1055-81. Review).

Psychotherapy

Beneficial emotional tonus, optimism and friendliness were permanent between the participants. It is encouraging that positive emotions, optimism, are universal therapeutic factors and they engage the deeper layers of the being.

Relaxation is a way to access miraculous (self) healing resorts and it is entering an intermediate state of consciousness induced by different methods of relaxation. Some members of the group practice mild, superficial meditation.

Sacrotherapy (10) is a powerful therapeutically skill. The patients participated at different religious manifestations inter-confessional. It was like a first step to ecumenism.

Methods for evaluation of the patients

- Anamnesis. Medical documents. General clinical examination.
- Blood pressure monitoring, pulse oximetry.
- Spirometry, EKG, thoracic X-ray.
- 6 minute walking test (6MWT).
- CAT/BPOC test.
- ACT/Bronchial asthma.

- St. George/Life quality questioner (SGRQ).
- Daily interviews/subjective evolution.

Salt mine therapy in images



Photo 1. Descending in salt mine



Photo 2. Planning



Photo 3. Rest cure



Photo 4. 6MWT



Photo 5. Kinesiotherapy, warm up



Photo 6. Kinesiotherapy



Photo 7. Sacrotherapy



Photo 8. Kinesiotherapy



Photo 9. Break



Photo 10. Climbing



Photo 11. Climbing

Results and discussions

Difficulties in quantifying the effects of salt mine therapy:

1. it is hard/impossible to discern for analysis, the isolated, selective influence of certain factors of the underground microclimate on the human body. The tested environmental parameters targeted certain aspects (and were therefore limited).
2. small doses of inadequate elements can be stimulating/adapting (not meaning that they are desired).

3. the elements of the environment are intricate and their interact with the human body in an integrative manner (not disparately), whereas the tests have a parcelled/mosaical approach.

4. the physical environment of the salt mine + favorable psychological factors:

- trust in the physician,
- friendliness in the group,
- sacrotherapy (10),
- taking part in a rigorous program, new to the lifestyle of the patients.

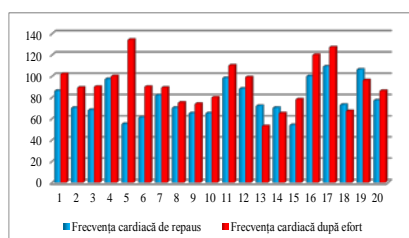


Fig. 4 Frecvența cardiacă a subiecților

Figure no. 4. Heart rate resting and after effort

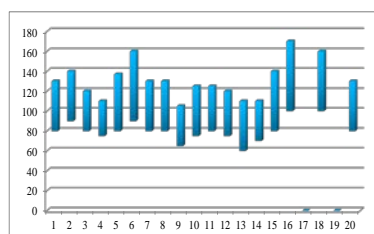


Fig. 5 Valorile tensiunii arteriale de repaus

Figure no. 5. Resting Blood pressure values

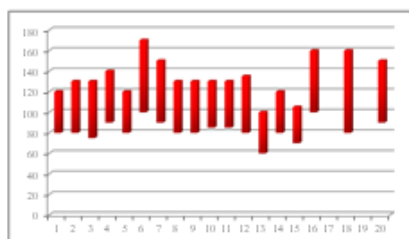


Fig. 6 Tensiunea arterială după efort (6 minute de mers, 6MWT)

Figure no. 6. Blood pressure after effort (6MWT)

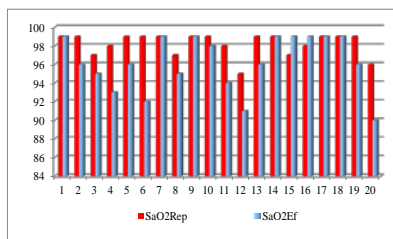


Fig. 7 Saturația O2 în sângele arterial în repaus și după efort

Figure no. 7. SaO2 resting and after effort

Conclusions

1. The effects of salt mine therapy at Cacica: the resulted changes are global, but they can only be quantified through tests that target smaller parts of the whole system.
2. All the patients reported an improvement:
 - the respiratory symptoms diminished,
 - an improvement of vocal function,
 - a restful sleep,

- augmentation of general endurance, etc.
- Including the polyallergic patient with hyperosmia was better.
- 3. They intend to take part to another such cure, “in the same group”.
They express their gratitude towards the organizers of the program.
They have also met after the cure.
- 4. The management of the region and of the salt mine may be ameliorate.
- 5. It is necessary to develop the rehabilitation in our region (11).

References

1. Simionca Gh. *Proiectul 2550 /Studiu complex medico-biologic în vederea utilizării inovative a factorilor potențial terapeutici de mediu din saline și pesteră în sănătate și turism balneoclimatic*. s.l.: Institutul Național de Recuperare, Medicină Fizică și Balneoclimatologie, 2008. CONTRACT DE FINANȚARE NR. 42120 CNMP - UEFISCDI, Program 4. Parteneriate în domeniile prioritare 4. Sănătate.
2. Iețcu Ioan, Simionca Gh, Ganea Motan Doina, Bîlha Claudia, Havriș Daniela, Zup Cornel, Todosi Petru, Rădășanu Vlad. *De la empirism la speleoterapie științifică în salina Cacica*. Turda : Prima Conferință de Speleoterapie din România, 2011.
3. Bîlha Neli Claudia. *Remodelarea generală în reabilitare*. Iași : EduMeet , 2010 mai 20-22.
4. Bîlha Neli Claudia, Bîlha Andrei, Bîlha Ștefan. *Noi aspecte ale remodelării generale în reabilitare*. Iași : Conferința ACCP, Iași, 2012 mai 10-12.
5. Bîlha Ștefan. *O abordare holistică: Salinoterapia și Kinetoterapia*. Lucrare de licență, 2012. Universitatea „Ștefan cel Mare”, Suceava. Facultatea de Educație Fizică și Sport, specializarea Kinetoterapie. Îndrumător, Conf. Dr. Petru Ghervan.
6. Bîlha Andrei. *Paradigma Medicina bazată pe dovezi și Kinetoterapia*. Lucrare de licență, 2012. Universitatea „Ștefan cel Mare”, Suceava. Facultatea de Educație Fizică și Sport, specializarea Kinetoterapie. Îndrumător, Conf. Dr. Petru Ghervan.
7. Iu. Simionca, M. Hoteteu, O. Mera, N. Grudnicki, C. Munteanu, H. Lăzărescu, L. Enache, D. Cintează, R. Călin, D. Ciotaru, G. Stoian. Conferința Națională de Speleoterapie cu participare internațională. Turda, Romania, 2011. Rezumatele comunicărilor științifice. Casa Cărții de Știință, Cluj-Napoca 2012. ISBN 978-606-17-0091-2.g.

8. Călin MR, Călin MA. Investigations on the presence and distribution of radon in the Cacica salt mine, Romania. *J Radioanal Nucl Chem* (2011) 288:203–206.
9. Klein S. Formula fericirii – minunatele descoperiri ale neuropsihologiei de azi. București: Editura Humanitas, 2005.
10. Dulcan Constantin Dumitru. În căutarea sensului pierdut. Cluj-Napoca: Editura EIKON, ediția a II-a, 2008.
11. Bîlha Neli Claudia. Reabilitarea respiratorie în județele Moldovei. International Scientific Conference, Transilvania University Brașov, ISSN 2065-6483, 2009:258-261.

Titlu: Salino-kinetoterapia.

Cuvinte cheie: salinoterapie, kinetoterapie, remodelare generală.

Rezumat: Valorificarea virtuților terapeutice ale microclimatului din saline și asocierea cu exercițiul fizic se realizează ocazional, în mod spontan sau relativ organizat. Studiul se referă la un grup eclectic (n=20) ce a participat la un program de recuperare în salina Cacica, județul Suceava, timp de 3 săptămâni. S-au analizat o serie de parametri modulați de microclimatul salinei, la care s-au asociat și alți factori cu valoare terapeutică. Salino-kinetoterapia reprezintă un exemplu de remodelare generală în reabilitare, concept pe care l-am introdus în 2010.

Titre: Salino-kinésithérapie.

Mots clés: spéléothérapie, kinésithérapie, remodelage global.

Résumé: Les bénéfiques des qualités thérapeutiques du microclimat des mines de sel peuvent être associés occasionnellement, dans une manière spontanée ou organisée, avec l'exercice physique. L'étude comprend un groupe électrique (n=20) qui a participé à un programme de récupération à Cacica, Conté de Suceava, pendant trois semaines. On a analysé une série des paramètres modulés par le microclimat de la saline et par des autres facteurs thérapeutiques. Spéléo-kinésithérapie représente un exemple de remodelage global, concept que nous avons introduit en 2010.