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SPELEOTHERAPY - scientific relevance in the last five years (2013 – 2017) – A systematic review

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Abstract

Speleotherapy, the use of the climate of salt mines and caves, is an accepted but not widely known therapeutic measure in the treatment of chronic respiratory diseases, especially for asthma. The microclimate of some caves and salt mine can beneficially affect respiratory disorders and should be considered as an optimal environment for complex respiratory rehabilitation. Main therapeutic indications of salt mines and caves are represented by respiratory diseases, especially asthma. Asthma is a disease characterized by chronic inflammation of the airways which make them hyperresponsive and change in their architecture, a process called remodeling. This paper shows the international scientific interest for speleotherapy in the last five years. During this period, only 21 uniques articles were found in the selected data bases which were interogated after the term “SPELEOTHERAPY”.

Key words: *Speleotherapy, respiratory diseases, asthma,*

Introduction

Today the speleotherapy is regognized as therapy in underground environments of salt mines and caves with natural therapeutic factors for many diseases (Iu.Simionca et al., 2013; Munteanu et al, 2012).

Speleotherapy today is a recognized and effective method of treatment, which is integrated into conventional medicine. At the same time, avalanche-like growth of artificial analogies of speleotherapy can be seen today almost in all countries of Europe. In the majority of cases their effectiveness is just declared. On the basis of general comparative overview of literary data and own scientific researches and practical experience a conclusion was made that according to their curative features, analogies of speleotherapy may be divided into two groups - with the presence of haloaerosol medium and without it. The main criterion for true artificial analogue of speleotherapy is the presence of rock salt aerosol medium. Twenty years experience of haloaerosoltherapy use in Scientific-practical medical Centre "Rehabilitation" in the treatment of more than 50000 patients with bronchopulmonary pathology confirms its high efficiency testified by the objective set of evidence-based diagnostic methods (Lemko, I. S. et all., 2015).

Methodology

Four main research articles Data Bases, respectively ISI WEB OF KNOWLEDGE, CROSSREF, PubMed and DOAJ were interogated with the keyword “Speleotherapy” in order to find which relevance has this domein in the scientific literature.

Results:

ISI WEB OF KNOWLEDGE - 7 Records
CROSSREF – 2 Records
PubMed – 9 Records
DOAJ – 3 Records

All the 21 unique articles are listed in the reference part of the present systematic review article.

Discussion

From **ISI web of knowledge** we found four main articles type, as descrebed below in their abstracts.

One of the papers (Roubal et all., 2017) from ISI web of knowledge deals with a methodology proposed for measuring the concentration of air ions in the environment of speleotherapeutic caves. A specific method for the calculation of spectral ion characteristics and the mode of automatic calibration were proposed and a procedure of automatic measurement in the absence of attendants was set up.

The measuring system is designed for studying and long-term monitoring of the concentration of light negative ions in dependence on climatic conditions and on the mobility of ions occurring in the cave.

The aim of other research (Kendrova et all., 2016) was to determine the effect of Speleotherapy on the quality of life, anxiety and depression in patients with COPD. Design of a Pilot study included 128 patients with CPOD (average age 64.05), examined during a spa treatment in a sanatoriums in the High Tatras. The experimental group (29 patients) completed spa treatment and Speleotherapy in the Belianska Cave. The control group (99 patients) completed a spa treatment without Speleotherapy. All patients were examined on admission and discharge, for an average 20-day treatment stay. They were evaluated on the basis of the quality of life (SGRQ), Beck and Zung, the Spirometric Test (FEV1 and FEV1/FVC) and the 6-minute Walk Test. After the treatment, concerning the patients of the experimental group, within the evaluation of quality of life there was significant improvement in symptoms ($p<0.05$). There was also statistically significant improvement in anxiety and the six-minute Walk Test ($p<0.05$). The pilot study shows that spa treatment along with Speleotherapy improves the quality of life and anxiety in patients with COPD. However, there is a need for prolonged study with more patients in order to demonstrate the effectiveness of this therapy.

After an other article (Lemko, I. S. et all., 2015), the therapeutic effect of salt mines, in medical terms, were found only in the last decades of the twentieth century. In course of time, Speleotherapy's beneficial effects have been proven, namely: high degree of air purity (sterility, relatively high air humidity (vapor content), vapor condensation favorite content, constant air temperature, low air flow rate, high content of carbon dioxide in the air, high negative ionization (high number of micro ions).

Chronic obstructive pulmonary disease (COPD) is a chronic, progressive disease and is treated with inhaled medication to optimize the patient's lung health through decreasing their symptoms, especially breathlessness. Halotherapy is the inhalation of micronized dry salt within a chamber that mimics a salt cave environment. Recent media reports suggest that this therapy may help with the symptoms of COPD.

The objective of this study was to critically evaluate and summarize the evidence for the use of halotherapy as a treatment for COPD, representing an other review using systematic approach and narrative synthesis related to speleotherapy. Data sources: Cochrane Central Register of Controlled Trials (CENTRAL), PubMed, MEDLINE, EMBASE, CINAHL, and Google Scholar were searched. Two reviewers independently reviewed abstracts and selected eligible studies based on predetermined selection criteria. Of the 151 articles retrieved from databases and relevant reference lists, only one randomized controlled trial met the inclusion criteria. A meta-analysis was unable to be conducted due to the limited number of published studies. Inclusion criteria were subsequently expanded to allow three case-control studies to be included, ensuring that a narrative synthesis could be completed. From the pooled data of the four studies, there were 1,041 participants (661 in the intervention group and 380 in the control group). The assessment of methodological quality raised issues associated with randomization and patient selection. Three themes were identified from the narrative synthesis: respiratory function, quality of life, and medication use.

Themes generated from the narrative synthesis data reflect outcome measures regularly used for interventional research associated with COPD. From this review, recommendations for inclusion of halotherapy as a therapy for COPD cannot be made at this point and there is a need for high quality studies to determine the effectiveness of this therapy (Rashleigh et all., 2014)

Conclusions

Speleotherapy is a valuable treatment method for asthma and other respiratory problems but only few studies are found in the international data bases, which reflects the specificity of this domain. On the other hand, fundamental studies on laboratory animals and on in vitro cell cultures demonstrated the efficacy and utility of speleotherapy.

From the total of 21 unique articles, a quarter come from Romania which is of special imprtance, in relation with the interest for this particular therapeutic environment in this country.

Romania has a huge potential in speleotherapy due to many salt mines and caves which can be found in this country.

References

1. Roubal Z., Bartusek K., Szabo Z., Drexler P., Uberhuberova J. - Measuring Light Air Ions in a Speleotherapeutic Cave - MEASUREMENT SCIENCE REVIEW Volume: 17 Issue: 1 Pages: 27-36 DOI: 10.1515/msr-2017-0004 Published: FEB 2017
2. Kendrova, L., Takac, P., Kubincova, A., Mikulakova, W., Nechvatal, P. - Effect of spa treatment and speleotherapy in the treatment of chronic obstructive pulmonary disease - a pilot study, Source: CLINICAL SOCIAL WORK AND HEALTH INTERVENTION Volume: 7 Issue: 2 Pages: 7-15 Published: 2016
3. Bilha Neli-Claudia, Bilha Stefan - Wich salt mine do you recommend for speleotherapy? Interdisciplinary project proposal, Source: BALNEO RESEARCH JOURNAL Volume: 6 Issue: 3 Pages: 172-175 DOI: 10.12680/balneo.2015.10101 Published: SEP 2015
4. Kovacs, M., Gaman, G. A., Calamar, A., Toth, L, Simion, S. - Gas Monitoring in the Environment, Following a Fire in an Underground Touristic Facility, Edited by: GulsunKilic M; Onel O; Basarir H; Karadeniz M; Torun Bilgic E, Source: Proceedings of the 24th International Mining Congress and Exhibition of Turkey, IMCET 2015 Pages: 1436-1442 Published: 2015
5. Lemko, I. S., Lemko, O. I., Haysak, M. O. - Haloaerosoltherapy - method of treatment or spa-procedure?, Source: ACTA BALNEOLOGICA Volume: 57 Issue: 1 Pages: 28-33 Published: JAN-MAR 2015
6. Rashleigh, Rachael; Smith, Sheree M. S.; Roberts, Nicola J. - A review of halotherapy for chronic obstructive pulmonary disease, Source: INTERNATIONAL JOURNAL OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE Volume: 9 Pages: 239-246 DOI: 10.2147/COPD.S57511 Published: 2014
7. Bilha, Neli Claudia; Simionca, I. - General remodeling in the rehabilitation process through salt mine speleotherapy, Source: EUROPEAN RESPIRATORY JOURNAL Meeting Abstract: 3501 Volume: 42 Supplement: 57 Published: SEP 1 2013
8. Iuri Simionca – Speleotherapy development in Romania on the world context and perspectives for use of some salt mines and karst caves for speleotherapeutic and balneoclimatic tourism purposes, Journal Article published 20 Sep 2013 in Balneo Research Journal, volume 4 issue 3 on pages 133 to 139
9. Adalat Yu. Abdullayev - Speleotherapy in the medical rehabilitation of chronic obstructive pulmonary diseases patients, 2014 , The Bulletin of Contemporary Clinical Medicine vol. 7, issue 3, p. 5 - 8, doi.org/10.20969/vskm.2014.7(3).5-8
10. Rogula-Kozłowska W, Kostrzon M, Rogula-Kopiec P, Badyda AJ. - Particulate Matter in the Air of the Underground Chamber Complex of the Wieliczka Salt Mine Health Resort., Adv Exp Med Biol. 2017;955:9-18. doi: 10.1007/5584_2016_176., PMID:
11. Barannikov VG, Kirichenko LV, Rusanova EA, Dement'ev SV, Vaĭsman IaI. - THE HYGIENIC CONDITIONS OF THE INTERNAL ENVIRONMENT OF SYLVINITE CHAMBERS OF VARIOUS MODIFICATIONS, Gig Sanit. 2015 May-Jun;94(3):34-7. Russian., PMID:
12. Thinová L, Froňka A, Rovenská K.The overview of the radon and environmental characteristics measurements in the Czech show caves., Radiat Prot Dosimetry. 2015 Jun;164(4):502-9. doi: 10.1093/rpd/ncv337. Epub 2015 May 21., PMID:
13. Bondar' IV, Minaev DIu, Nasretdinov IN, Petukhov AE. - "Podmoskovie"--health resort institution of the Federal Drug Control Service of the Russian Federation celebrates the 20th anniversary, Voen Med Zh. 2014 Dec;335(12):62-5. Russian., PMID:
14. Levchenko PA, Dubovik NN, Delendik RI. - Our experience with the application of the speleotherapeutic treatment based at the state healthcare facility "Republican Speleotherapeutic Hospital", Vopr Kurortol Fizioter Lech Fiz Kult. 2014 Nov-Dec;(6):26-9. Russian., PMID:
15. Minaeva NV, Koriukina IP, Plakhina KV. - The immediate and long-term results of sylvinite speleoclimatotherapy in the children presenting with pollinosis, Vopr Kurortol Fizioter Lech Fiz Kult. 2014 Mar-Apr;(2):29-32. Russian., PMID:
16. Rashleigh R, Smith SM, Roberts NJ. - A review of halotherapy for chronic obstructive pulmonary disease., Int J Chron Obstruct Pulmon Dis. 2014 Feb 21;9:239-46. doi: 10.2147/COPD.S57511. eCollection 2014. Review., PMID:
17. Galamba AA, Tovt-Korshyns'ka MI, Rostoka-Reznikova MV, Sukhan VS, Dychka LV. - Rehabilitation features in the prevention of asthma exacerbations in patients with different body weight, Wiad Lek. 2014;67(2 Pt 2):173-5. Ukrainian.;
18. El'kin VD, Vladimirskiĭ EV, Barannikov VG, Gorovits ÉS, Kopytova EA. - The hygienic characteristic and effectiveness of the application of natural sylvinite screens for the combined treatment of the patients presenting with vulgar psoriasis, Vopr Kurortol Fizioter Lech Fiz Kult. 2013 Mar-Apr;(2):29-32. Russian.
19. Maiorescu Georgeta, Timotin Victor, Simionca Iuri, Grudnicki Nicolae, Zup Cornel - Existing and perspective arrangements to Salina Cacica in the context of tourism development in salt mines, Balneo Research Journal. 2014;5(1):25-36 DOI 10.12680/balneo.2014.1061
20. Lemko Ivan S., Lemko Olha I. - New technologies of haloaerosoltherapy at asthmatic patients, Balneo Research Journal. 2013;4(1):49-52 DOI 10.12680/balneo.2013.1042
21. Munteanu Constantin et all. – Speleotherapy effects on wistar rats reflected by pulmonary and dermal fibroblasts cultures, Balneo Research Journal. 2012;3(4):100-107 DOI 10.12680/balneo.2012.1035