

This article was downloaded by: [Jenny]

On: 12 July 2010

Access details: Access Details: [subscription number 924308320]

Publisher *Informa Healthcare*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Disability & Rehabilitation

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713723807>

Speleotherapy: a special kind of climatotherapy, its role in respiratory rehabilitation

Tibor Horvath^a

^a Municipal Hospital, Tapolca, Hungary

To cite this Article Horvath, Tibor(1986) 'Speleotherapy: a special kind of climatotherapy, its role in respiratory rehabilitation', *Disability & Rehabilitation*, 8: 2, 90 – 92

To link to this Article: DOI: 10.3109/03790798609166185

URL: <http://dx.doi.org/10.3109/03790798609166185>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Editorial note

It is the editorial policy of this journal only to publish papers in the main columns which have either been exposed to stringent peer review or solicited (in Symposia) from acknowledged authorities in the field being considered. However, to broaden the experience of rehabilitation world-wide we have frequently carried articles which are not "high science" under the general heading "Rehabilitation Scene".

Below we publish just such a paper, "Speleotherapy: a

special kind of climatotherapy", from Hungary. We hope you enjoy it. If you have special experience of alternative forms of rehabilitation, especially from countries that do not frequently appear in these columns, we would be most interested to consider them. The overall policy will remain the same, but helping disabled people of whatever creed, colour, culture or nationality demands that we share our wider experience.

A. K. CLARKE, *Assistant Editor*

Rehabilitation Scene

Speleotherapy: a special kind of climatotherapy, its role in respiratory rehabilitation

TIBOR HORVATH

Municipal Hospital, Tapolca, Hungary

Revised paper accepted for publication: February 1986

Correspondence to: T. Horváth, MD, Head Physician, Municipal Hospital, Tapolca, POB 136, H-8301, Hungary

Key words Lung diseases, obstructive - Microclimate - Rehabilitation

Summary Speleotherapy, the use of the climate of caves, is an accepted but not widely known therapeutic measure in the treatment of chronic obstructive airway diseases. This study summarizes the therapeutic experiences of more than 4000 patients who were treated in a 10-year period in a hospital-cave complex in Tapolca, Hungary. A sharp and long-lasting clinical improvement and a significant recovery from airway obstruction could be observed in the overwhelming majority of patients. It is established that the microclimate of some caves can beneficially affect these disorders, but the cave should be considered as an optimal environment for complex respiratory rehabilitation.

The frequency of the chronic obstructive pulmonary diseases (COPD) - bronchial asthma, chronic bronchitis and pulmonary emphysema - is increasing world-wide. They are a heterogeneous group of disorders, and there are many aetiological factors, including allergy, viral or bacterial infection, occupational injury, air pollution, exercise, and climatic as well as psychosocial factors. COPD cause a lot of suffering, resulting in disability in patients, and distress in their relations within their family or workplace. Treatment is a difficult and complicated task, which cannot be successful with medicaments alone. The best chance of success is a rehabilitation process, which involves both specific medicinal treatment and non-specific physio- and psychotherapeutic methods.

In the treatment of COPD the mountain and seaside health resorts have a certain tradition. Some 30 years ago there commenced a process in the course of which previous lay experience of the beneficial influence of the climate of several caves on breathing damage was taken up by orthodox medicine^{1, 8}. As a result of this trend, speleotherapy, the employment of the climate of caves in the treatment of COPD, has become an official therapeutic measure, accepted and assisted by the public health authorities in several countries in Europe.

Patients with COPD have been treated for about 10 years in Tapolca, Hungary, in a large limestone cave, originated from the "sarmata floor" of the Mesozoic Era. Details of the cave are listed in Table 1. The cave gives unparalleled possibilities, as it is situated just under the municipal hospital, so close contact could be established between the cave and a special hospital ward, assuring a stable professional background and the possibility of realizing a complex respiratory rehabilitation procedure, when patients can receive various therapeutic treatments in addition to medicines and climatotherapy.

In the course of a 3-week "cure" patients spend 4 hours daily in the comfortably equipped and evocatively illuminated cave, where a gymnastic hall is fashioned as well. The patients are resting in beds, doing breathing exercises as well as relaxation training. Here, in this special milieu, psychotherapeutic meetings are conducted in small groups. In the special hospital department

Table 1 The important characteristics of "Hospital" cave Tapolca

Depth	15.0 m
Basic area	1300 m ²
Cubic capacity	4000 m ³
Humidity	95-99 rel. %
Temperature	11-12°C (the fluctuation is the 1/20 part of the surface's)
Air motion	0.04-0.08 m/s
CO, SO ₄ , NO ₃	—
CO ₂	0.2-0.7 vol. %
O ₂	21.5-21.8 vol. %
Ca ⁺⁺	14.6 mg/l
Mg ⁺⁺	4.2 mg/l
Na ⁺	13.1 mg/l
F	0.09 mg/l
Number of grains of dust	21-27 grain/cm ³ (in the hospital yard 49 grain/cm ³)
Number of seeds in the course of cure	
24 h	6 (0-23) colony/Petri-cup
48 h	17 (1-52) colony /Petri-cup
after 3 weeks pause	Sterile

patients can receive electro-, or phototherapy, take part in vertebral exercises and undergo expectorant procedures, that is inhalation with secretolytic aerosols, vibration, and postural drainage. The patients are under permanent medical care for the whole course of the "cure". The drugs they have taken before are given them in unchanged doses, or - if possible - dosages are reduced, especially steroids.

During the past decade more than 4000 patients have been treated here. We have reported various aspects previously^{9, 13}. This paper reports data to show the effectiveness of the "cure" both subjectively and objectively.

Material and methods

All the patients had been hospitalized, diagnosed and therapeutically adjusted in one of the pulmonary institutes, according to internationally accepted standards, and transferred to us in order to participate in climatotherapeutic, rehabilitation follow-up care. All of them had COPD with varying degrees of airway obstruction.

In 1978-79, 151 adult patients (89 men, 62 women; mean age 46 years; 101 with chronic bronchitis and 50 with bronchial asthma) were admitted and examined for changes in their clinical condition as compared to the medical request, as well as the changes in their airway obstruction, measured by forced expiratory volume in litres per second (FEV₁). The clinical condition was scored every day, jointly by the patient and the physician, on the basis of symptoms and complaints; the FEV₁ values were recorded (Eutest, Medicor) at the beginning and end of hospitalization, by the same staff and under the same conditions. The purpose of this retrospective survey was to examine whether a stay in the cave microclimate could further improve the condition of patients, whose clinical status had been therapeutically stabilized previously.

Between 1979 and 1980 we initiated the method of complex respiratory rehabilitation as detailed above. The same data were collected in 1980-82 to examine whether this course had any benefit over the passive climatotherapy. There were 230 patients (137 men, 93 women; mean age 49 years; 141 with chronic bronchitis and 89 with bronchial asthma). The individual patient groups, according to the distribution of age, sex, diagnosis and the initial degree of the airway obstruction, were comparable. In the statistical analysis Student's *t* test was applied.

Results

Table 2 shows that the clinical condition of the patients considerably improved, with unchanged, substantially reduced, or discontinued drug administration, even under passive climatotherapy. There was, however, no significant change in FEV₁ values.

Under complex respiratory rehabilitation care clinical improvement was more pronounced, together with a statistically

Table 2 Changes of clinical state, medication request and mean FEV₁ value of 151 patients treated with climatotherapy

Clinical state	Medication request		Total	
	Reduced dosage or omission	Unchanged dosage	No.	Percentage
Improved	89	21	110	72.8
Unchanged	—	40	40	26.5
Deteriorated	—	1	1	0.7
Total				
No.	89	62	151	
Percentage	59.0	41.0		100.0

FEV ₁ mean ± SD (ml)	
Before the cure	1638 ± 613
After the cure	1666 ± 684

Table 3 Changes of clinical state, medication request and mean FEV₁ value of 230 patients treated with complex respiratory rehabilitation

Clinical state	Medication request		Total	
	Reduced dosage or omission	Unchanged dosage	No.	Percentage
Improved	197	11	208	90.4
Unchanged	—	20	20	8.7
Deteriorated	—	2	2	0.9
Total				
No.	197	33	230	
Percentage	85.7	14.3		100.0

FEV ₁ mean ± SD (ml)	
Before the cure	1468 ± 631
After the cure	1676 ± 706

highly significant (*p* = 0.001) recovery from the airway obstruction (see Table 3).

Discussion

The cave microclimate has some passive health-giving factors: even temperature; softened meteorological front activity; absence of air pollutants, micro-organisms, or allergens in the air; and the environment is low in external stimuli. Due to their beneficial influence, the cave decreases the risk of cold, viral and bacterial contamination, manifestation of allergy, or bronchospasm due to meteorological factors. The relaxing effect and the psychic impression of the special surroundings are also of great importance. The most important factor, which is presumed to have an active health-giving effect, is the very high vapour content, forming an electro-aerosol with acid reaction, negative electric charge and ionization, as well as a high calcium and magnesium concentration. As a result of its biological effect a significant acceleration of mucociliary clearance can be observed because of the mucosecretolytic, spasmolytic activity, namely the self-purification of airways becoming more effective.

All of these can favourably influence the general condition of patients with COPD. At an early stage of these psychosomatic, neurovegetative diseases the health-resort environment; the clear air; the special, protective climate of the cave; and the expectorant effect of the aerosol can be efficacious in themselves. The climatotherapy, according to our results, can advantageously amplify the possibilities of conventional hospitalization.

At an advanced stage of the diseases, however, all of these can prove to be insufficient, but the cave microclimate can be considered as an optimal environment for a complex respiratory rehabilitation procedure. Under the special fundamentals of the cave, with an increased efficiency, certain non-specific treatment methods can be applied. For instance the maximally clear, humid air remarkably improves the actual effect of the breathing exercises; the milieu free of stimuli can shorten the duration of the acquirement of the relaxation training; and the psychotherapeutic meetings more easily achieve their aim in this relaxing, protective environment. All of these serve as a basis, and are supplemented with other sorts of specific and non-specific methods which cannot be realized in the cave - for complex respiratory rehabilitation.

Accordingly, speleotherapy, as understood by us, is not merely the passive use of an advantageous climatic potentiality, but rather a complex treatment, when we adopt the individual rehabilitation methods simultaneously in a special and effective climatic milieu. The final result is due to complex medical activity.

It can be stated positively that speleotherapy as a combined rehabilitation programme, carried on in a special climatic environment, exerts a beneficial influence on the clinical status of patients with COPD. This effect proves to be long-lasting. According to data derived from questionnaires and personal information, as well as sick list statistics, the clinical improvement

Downloaded By: [Jenny] At: 22:11 12 July 2010

lasts on average 8 months in the overwhelming majority of the patients, with reduced need for medication and hospitalization, as well as shorter periods of sick leave. The reversible part of the airway obstruction can be favourably controlled, the allergic reactions reduced, somatic ability and psychic tolerance increased. Speleotherapy can assure a better life quality for some time. It is recommended first of all to patients with mucus retention due to hyper- and dyscrinia, with pronounced psychic alterations and with accessory and secondary chest wall abnormalities.

References

- 1 Cauer H. Chemisch-physikalische Untersuchungen der Klimaverhältnisse in der Kluterhöhle. *Arch Physik Ther* 1954; **6**: 1-20
- 2 Kessler H, Mörk J, Morlin Z and Várkonyi T. Air hygienic investigations in the Lake cave of Tapolca. *Geogr Med* 1969-70; **1**: 171-191
- 3 Kessler H. A speleoterápia. *Balneaologia, Rehabilitáció, Gyógyfürdőügy* 1982; **3**: 105-111
- 4 Kraszkó P, Jónás J and Szoboszlav F. Results of cave climate therapy in the obstructive respiratory syndrome. *Allerg Immunol* 1974-75; **20-21**: 47-54
- 5 Picicocchi A and Utili F. Einige Nachrichten über die Speläotherapie in der Monsummano-Höhle. *Int Sonder-symposium für speläotherapie* Ennepetal, 1979; 73-74.
- 6 Ricny D. Speleotherapy in Moravian Carst. *VII Intern Symposium in Speleotherapy* Keszthely-Tapolca, 1982; 249-258
- 7 Schulz E. Kluterhöhle und Asthma. *Med Klin* 1952; **47**: 1310-1311
- 8 Spannagel KH. Die Behandlung des Asthma bronchiale und der chronischen Bronchitis in der Kluterhöhle. *Z Angew Bäder-u Klimaheilk* 1960; **7**: 684-696
- 9 Horváth T. Erfahrungen mit der Höhlenklimatherapie in den Heilgrotten von Tapolca auf Grund der Ergebnisse an 1000 Patienten. *Int Sonder-symposium für Speläotherapie* Ennepetal, 1979; 59-72
- 10 Horváth T. Effect of speleotherapy on obstructive airway diseases in childhood. *Atti del VI Simposio Internazionale Speloterapia* Firenze, 1980; 60-68
- 11 Horváth T. A barlangterápia helye az idült légzőszervi megbetegedések komplex kezelésében. *Balneológia, Rehabilitáció, Gyógyfürdőügy* 1981; **2**: 23-28
- 12 Horváth T. A barlangterápia lehetőségei és szerepe az idült léguti megbetegedések komplex rehabilitációjában. *Pneumol Hung* 1983; **36**: 343-346
- 13 Horváth T. A barlangterápia, mint légzésrehabilitációs módszer hatása a léguti obstrukcióra. *Balneológia, Rehabilitáció, Gyógyfürdőügy* 1984; **5**: 167-169

Book reviews

Science without the practice

Spinal Cord Injury, edited by N Eric Naftchi, MTP Press, Lancaster. 269 pages, 93 illustrations. £31.25. ISBN 0-85200-606-3.

Anyone looking to this publication for guidance in the practical management of a spinal cord injured patient will be disappointed. What is presented is a collection of research articles, many derived from animal experiments, grouped into six sections. Section One: Molecular Mechanisms of Acute Traumatic Spinal Cord Injury. Section Two: Sequelae of Spinal Cord Injury: Possible Mechanisms of Spasticity and Pain Perception. Section Three: Haemodynamic Changes during Autonomic Dysreflexia. Section Four: Bone Mineral and Matrix Changes following Spinal Cord Injury: Possible Modes of Treatment. Section Five: Renal and Urinary Bladder Physiology. Section Six: Hormonal and Behavioural Aspects of Spinal Cord Injury.

In none of the sections is the chosen topic dealt with compre-

hensively, and indeed the subject selection appears to have been highly idiosyncratic. For example, under Section Five 'Electromyography of the Human Urinary Bladder' and 'The Effects of Head-up Tilt on Glomerular Filtration Rate and Renal Plasma Flow in Spinal Man' only are considered, and in Section Six, 'Pituitary-Testicular Axis Dysfunction in Spinal Cord Injury and Psycho-Sexual Adjustment in Spinal Cord Injury - an Holistic Approach'.

Many of the chapters in this book will, however, prove of interest to those involved in spinal cord injury work because they review aspects of current research and provide a source of reference. As such this book has a place in departmental libraries, but I doubt its appeal will be greater than this.

J. A. RUSSELL

A well-established handbook

A Synopsis of Rheumatic Diseases, 4th edition, by DN Golding, Wright, Bristol. 306 pages, 63 illustrations. £9.50. ISBN 0-7236-06277.

The publication of the 4th edition of a small book such as this suggests that it has proved successful and generated enough demand to justify the basic concept outlined in the Preface to the 1st edition. It is intended to cover the essentials of rheumatology for the general physician and postgraduate student, and also to be of use to general practitioners and undergraduates.

The overall impression created is of an heroic attempt to include the whole spectrum of rheumatology in a pocket-sized book. There is indeed a great deal of factual information condensed into a small volume. As the author himself admits, this is at the expense of being dogmatic. The style is staccato and there are not pretensions to literary excellence. The balance between different aspects of rheumatology is reasonable and the book does cover virtually the whole range of rheumatic disease as seen in outpatient clinics, although many of the minor, non-inflammatory rheumatic disorders do not feature prominently in the practice of the intended readership of general physicians, nor in the content of the MRCP examination. However, the inclusion of a serious account of minor rheumatic problems does make the book useful for the practising

junior doctor, especially those working in rheumatology, casualty or orthopaedic departments, or in general practice. There is, for example, a useful section on vertebrogenic and regional pain syndromes and the mode of examination appropriate to them.

Criticisms can be made of some chapters. These include an unacceptable classification of juvenile chronic arthritis. This heterogeneous group of diseases should not be viewed as a variant of adult rheumatoid arthritis. In addition the chapters on immunology and pathogenesis are rather too elementary for the intended readership and the chapter on physical examination hardly does justice to its importance (the latter a fault shared with some other rheumatology textbooks). The diagrams of hip prostheses on page 142 are amateur and anatomically inaccurate. There is, however, a valuable chapter on the applications of physiotherapy and other rehabilitation techniques in rheumatology.

Overall, there is much useful in this book for the junior, non-specialist doctor who finds himself having to cope with "rheumatic" outpatients or inpatients, and it can be carried easily in the pocket or medical bag. The more detailed needs of the aspiring physician specialist in rheumatology would be better served by larger and more discursive texts.

M. I. D. CAWLEY