BALNEO RESEARCH JOURNAL
English Edition
eISSN 2069-7619 pISSN 2069-7597 ROMANIAN ASSOCIATION OF BALNEOLOGY

Thalassotherapy today

MUNTEANU Constantin[1,2], MUNTEANU Diana[1,3]

Corresponding Author: **MUNTEANU Constantin**, E-mail: office@bioclima.ro

Balneo Research Journal DOI: http://dx.doi.org/10.12680/balneo.2019.278 Vol.10, No.4, December 2019 p: 440–444

1. Romanian Association of Balneology, Bucharest, Romania
2. Emergency Clinical Hospital Bagdasar-Arseni, Bucharest, Romania
3. National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania

Abstract

Introduction. Thalassotherapy has many aspects in common with thermalism or balneotherapy but also some distinctive characteristics. Balneology has a long European and Asian tradition and Romania can be the cornerstone of international bridges in this area due to its geographical position, legendary tradition and extraordinary natural resources of all kind. Each Balneary Resort begins its story with the discovery of natural factors whose therapeutical value has been clinically and experimentally proven by scientific personalities of that time. (1). **Material and method.** This article is a systematic and summarizing review of all published articles related to the thalassotherapy and thermal medicine subject found in *Web of Science Core Collection*. The methodological work is focused on the development of a bibliometric study of the literature generated regarding "thalassotherapy" therm. The analysis process followed integrates the use of descriptive-quantitative statistical techniques, which constitute a series of bibiliometric indicators that allow explore the research dynamics followed so far by the scientific community. These bibliometric indicators are numerical data that enable the analysis of diverse features of the scientific activity, linked both to the production and consumption of information and are based on the so-called "bibliometric laws". **Results and discussions.** Analyzing an article database can be of real impact on the development of the field of *Thalassotherapy* but also can drive the future implications in the scientific arena. **Conclusions.** In balneary tourism, the importance of researching natural resources is essential for the development of a balneary resort promotion plan, thus providing information on the therapeutic properties of natural factors, their contribution to our health and the biological mechanisms by which they act on our body.

Keywords: *Thalassotherapy, Balneology, Balneotherapy, Balneary Resort, Web of Science Core Collection*

1 Introduction

Balneotherapy (Latin: Balneum, bath) refers to the medical use of water as opposed to its recreational use. It is difficult to pinpoint the exact origin of the first spa and spa treatments. It was practiced by the ancient Greeks, Babylonians and Mesopotamians. Homer and other classical writers report that the Greeks indulged in a variety of social baths as early as 500 BC, including hot-air baths known "*laconica*" (2-5).

The Romans were responsible for the popularity and spread of spa therapy to other parts of the world. Roman soldiers sought hot baths to recuperate after prolonged battles. The baths were referred to as "aquae". The concept of spa flourished with the continued use of the major springs even after the decline of the Roman Empire.

In **Thalassotherapy**, sea water is used and characterized by its high mineral content, high density, and its chemical composition rich in chlorides of mainly sodium besides magnesium, calcium, potassium, and iodine, along with marine peloids known as limes. These applications include their application with systematic methodic exposure to sun, total or partial application of hot sea sand, and marine climatotherapy (based on atmosphere), temperature, humidity, wind, air pressure, etc.

The term Thalassotherapy stems from the Greek word thálassa (θάλασσα) meaning sea or ocean and comprises many seawater-based treatments. Treatments on the base of remedies taken from the sea are quite common in Europe and used as well in wellness tourism as in medical tourism (6-10).

Thalassotherapy covers a wide spectrum, ranging from the medical treatment of chronic illnesses, such as respiratory or skin diseases, to prophylaxis in healthy individuals (11).

It is also a component of wellness programs. Indication in these cases consists in toning-up and improving physical fitness (12).

The term thalassotherapy shall be used only if the following definitions and prerequisites are met and the following measures are offered or taken:

1. Thalassotherapy is an integrated plan for therapy, prevention, and health promotion. The plan shall be implemented for defined indications under medical care and with the participation of qualified expert staff.
2. Therapeutic location immediately by the sea. Thalassotherapy shall be carried out in places where the maritime climate has an immediate effect.
3. Sea water. The sea shall be used for bathing in natural waters. Suitable sea water that is drawn locally shall be used for inhaling and/or bathing, e.g. in a bathtub or a swimming pool.
4. Marine products. It is possible to use mud or algae etc. for different applications.
5. Low-allergen and clean sea air. The quality of the air must warrant that extended stays in the open air will represent a relieving factor.
6. Heliotherapy. Natural solar radiation shall primarily be used for heliotherapy. In adverse weather conditions artificial UV irradiation may supplement heliotherapy.
7. Exposure to the climate and motion therapy. Exposure to the climate and motion therapy shall be carried out in fixed regimens in the zone close to the shoreline.
8. Associated health-promoting measures. Associated health measures, emphasizing relaxation, change of nutrition, and physical exercise shall be carried out to improve overall physical fitness.

The concept of well-being has its origin in the work of Halbert Dunn in 1959, in which he discusses a particular state that incorporates a general sense of well-being that is formed by the body, mind, spirit, and surrounding environment (13-16). Since old times, health has been known as a motivation to travel. We can mention examples like the Roman terms, the Turkish baths, the Japanese onsens, or nowadays the Alpine healing resorts. However, in recent years, health tourism has reinvented itself and grown in popularity, becoming a tourist phenomenon worldwide with an upward trend, due to the growing awareness of the importance of health in the middle and upper middle classes (25).

In the framework of a sustainable littoral environment use (26), coupled with responsible ecotourism is now the development of thalassotherapy centers. Indeed, medical results claims are increasingly made, and the last decade witnessed the inclusion of thermal, climatic, and thalassotherapeutic medicine in the curricula of some colleges of medicine in European universities, paired with their recognition as a specialization.

Osteopathy, chiropractic, naturopathy (a drugless medical approach using remedies believed to help nature overcome illnesses), naprapathy (a medical approach based on massages), acupuncture (from Latin aculeus, needle; a medical approach based on placing needles on the body on force lines), Chinese traditional medicine, thermalism (from the Greek, heat or warmth; thermalism is a medical approach using thermal [mineral] waters), thalassotherapy (from the Greek, sea, and, treatment; thalassotherapy is a medical approach based on the systematic use of seawater, sea products, shore climate), aromatherapy (from the Greek, perfume; aroma-therapy is a medical approach based on use of odors exhaled, particularly by plants), crenotherapy (a medical approach based on spring waters on the site of the spring itself), balneotherapy (from the Latin balneum, bath; balneotherapy is a medical ap-proach based upon the taking of baths), and others have en-tered the common vocabulary for some time (27).

Many treatments have received the thalassotherapy label; all do not deserve it. Because of its recent success, the term has been usurped to indicate so-called ‘‘spa’’ treatments. It would be best to limit its use to seaside treatments calling upon climate factors, seawater bathing, impact of waves, marine (e.g., algal) products poultices, seawater medication; the approach is very similar to thermalism, but is geared to the role of the sea and seawater.

Cure translates best, in this instance, as treatment. A curist is thus someone following a treatment, usually at a thermal or thalassotherapy / thermal center; by extension it has also been used for a prolonged stay at a climatic resort. A journey to a cure station was one to improve or restore one’s health, the avowed aim, and one of tourism and discovery, the hidden aim. Nowadays curist and tourist are commonly both one and the same person.

Both the treatment and the desire to know a region and its cultural traits motivate the visitor. The search for better-being simultaneously with well-being points to a trend to link the medical quality of cures to the tourists' and curists' qual-ity of life. An effort is also directed toward children who may find relief, cure, or improvement of ailments related to breathing, skin problems, and developmental troubles, such as enuresis, growth, and fracture healing: Mens sana in corpore sano — a healthy mind in a healthy body (21).

Thalassotherapeutics and thermalism (heat, warmth) got a boost in the nineteenth century with tourism's emergence. The enthusiasm displayed by prestigious visitors to thermal health centers made it possible for cure stations to associate cultural, leisure, and often gambling activities with a treatment program (21).

In Health Resort Medicine, both balneotherapy and thalassotherapy, salt waters and their peloids, or mud products are mainly used to treat rheumatic and skin disorders. These therapeutic agents act jointly via numerous mechanical, thermal, and chemical mechanisms (17).

When topically administered, this water rich in sodium and chloride penetrates the skin where it is able to modify cellular osmotic pressure and stimulate nerve receptors in the skin via cell membrane ion channels (17).

The actions of salt mineral waters are mediated by a mechanism conditioned by the concentration and quality of their salts involving cellular osmosis-mediated activation / inhibition of cell apoptotic or necrotic processes. In turn, this osmotic mechanism modulates the recently described mechanosensitive piezoelectric channels (17).

Among the core elements used in Health Resort Medicine, we find mineral waters whose physical-chemical composition plays a key role in their therapeutic properties. The use of salt waters is common in balneology and these waters are defined as those with a mineral content of at least 1 g/L of dry residue consisting of over 20% mEq/L of both chloride and sodium ions (17).

There is scarce information on hydrophilic molecules capable of crossing the stratum corneum, or on their rates of absorption and/or desorption. However, we may reasonably assume the absorption of hydrophilic solutes, enhanced in specific conditions such as occlusion or with the use of techniques promoting the penetration of polar substances such as molecules that induce cutaneous penetration, electrical fields, or ultrasound (17). In addition, we should not ignore the influence of temperature and hydrostatic pressure of balneotherapy.

Human skin permeability data exist for over 50 hydrophilic solutes and prediction studies of the absorption of these solutes have tried to relate molecular structure to permeability. These have been mainly statistical models fitted to experimental data (17).

Thalassotherapy, and also thermalism, are thus not new to the panoply of medical approaches. What is new is the updating of the facilities and the introduction of new technological advances. Balneotherapy and exposure to coastal climate have been essentially readaptive and convalescence treatments, but the constantly growing segment of younger and middle aged people seek an effective approach to reshaping, a remise en forme, encompassing not only physical reshaping but also a health restorative process (18,19,20,21,22,23,24).

Both thermalism and thalassotherapy use waters, mud, and thermal gasses; thalassotherapy is alone in using algae, seawater, and only the aeration thereof. Techniques, however, appear to be quite similar. Thalassotherapy stations have a long history; the largest number are located in Germany and France. Most of the 22 German stations grew in importance during the last half century as they fast attracted a large clientele. Homeopathy and alternative therapy have a large following in Germany (25,26,27).

The introduction of new technologies such as the combination of electroacupuncture with thalassotherapy won over a new clientele. Thalassotherapy / electrotherapy / acupuncture, brought back from China, rapidly gained droit de cite´ and garnered enthusiasts in French centers.

At the onset of the so-called social medicine programs, physicians routinely prescribed a two or three weeks cure. The abuse was particularly notorious in Germany. The gag was that when a beneficiary of such a cure would leave, he or she would be said to have taken his/her paid government-sponsored free vacation. The distress flag was eventually raised and these cures were accused of being quackery. The accusation seems unfair, though the social benefits' abuse was in many cases flagrant (24).

Development must be considered on a long-range Already during classical times physicians and drug makers looked at the sea as a source of remedies. The ocean's drug chest contains many plants and animals that provide ingre-dients usable in medical

treatments. Fish, oysters, and mussels provide iron in the human diet. Cod liver oil and salmon oil possess important medicinal uses. Numerous other animals, which place lower on the evolutionary ladder, are sources of pharmaceuticals.

The medical and pharmaceutical value of marine products has of course been proved (9). Marine organisms produce chemical compounds — and over 6000 unique compounds have been isolated with hundreds providing drug leads - with antiviral, antibacterial, and antifungal properties.

Natural Therapeutic Factors	Sun / Light	Air / Wind	Sand	Mud	Seawater	Salt
	All relevant weather conditions		More solid substances as part of the beach		Seawater and its ingredients	
Treatments	Sunbath	Airtherapy	Psamotherapy	Pelotherapy	Sea Bath	Salty air inhalation
	Heliotherapy	Salty air inhalation	Peeling	Peeling	Shower (jet shower)	Peeling
	Sport and other outdoor activities (gym)		Thermotherapy	Wrapping (pack)	Underwater massage	

Table 1: The Thalasso-grid (source: Adapted from Illing 2018)

Conclusion

One of the aims of balneotherapy is to soothe the pain, improve joint motion and as a consequence to relieve patients' suffering and make them feel well. A contrario from the ailments treatable by thalassotherapy by the scientific authors, many centers appeal to the prob-lems of the day and advertise in addition to thalassotherapy, reshaping, beauty, well-being, golf pain cures, antistress, slimming, dietetics, backaches, heavy legs, antismoking, postchildbirth, chronic headaches, or insomnia. The current fascination with native medication has led some centers to associate thalassotherapy with the Indian techniques of ayur-veda. Ayurveda claims to disintoxicate the body taking into consideration the physical or physiological type of the indi-vidual. It involves massages with warmed-up oils in a setting of candles, de´cor, and petals. To the serious thalassothera-peute this is far removed from the true base of the therapy (24-27).

Bibliometric analysis was used as the research methodology to meet this objective. The international database Web of Science was used to identify the scientific publications (24).

Thalassotherapy is a developing part of health tourism all around the World that are near the ocean and sea countries (21,30).

References

1. Munteanu Constantin, Munteanu Diana, Hoteteu Mihail, Dogaru Gabriela - Balneotherapy – medical, scientific, educational and economic relevance reflected by more than 250 articles published in Balneo Research Journal, Balneo Research Journal. 2019;10(3):174–203 DOI 10.12680/balneo.2019.257
2. Zijlstra, TR; van de Laar, MAFJ; Moens, HJB; et al. - Spa treatment for primary fibromyalgia syndrome: a combination of thalassotherapy, exercise and patient education improves symptoms and quality of life, RHEUMATOLOGY Volume: 44 Issue: 4 Pages: 539-546 Published: APR 2005.
3. Langhorst, Jost; Musial, Frauke; Klose, Petra; et al. - Efficacy of hydrotherapy in fibromyalgia syndrome-a meta-analysis of randomized controlled clinical trials, RHEUMATOLOGY Volume: 48 Issue: 9 Pages: 1155-1159 Published: SEP 2009.
4. Gomes, Celso; Isabel Carretero, Maria; Pozo, Manuel; et al. - Peloids and pelotherapy: Historical evolution, classification and glossary APPLIED CLAY SCIENCE, Volume: 75-76 Pages: 28-38 Published: MAY 2013,
5. de Andrade, Sandra Cristina; Pereira Pessoa de Carvalho, Ranulfo Fiel; Soares, Aluizio Silvio; et al. - Thalassotherapy for fibromyalgia: a randomized controlled trial comparing aquatic exercises in sea water and water pool, RHEUMATOLOGY INTERNATIONAL Volume: 29 Issue: 2 Pages: 147-152 Published: DEC 2008.
6. Zijlstra, T. R.; Braakman-Jansen, L. M. A.; Taal, E.; et al. - Cost-effectiveness of Spa treatment for fibromyalgia: general health improvement is not for free, RHEUMATOLOGY Volume: 46 Issue: 9 Pages: 1454-1459, Published: SEP 2007.
7. Kazandjieva, Jana; Grozdev, Ivan; Darlenski, Razvigor; et al. - Climatotherapy of psoriasis, CLINICS IN DERMATOLOGY Volume: 26, Issue: 5 Pages: 477-485 Published: SEP-OCT 2008.
8. Riyaz, Najeeba; Arakkal, Faiz Riyaz - Spa therapy in dermatology, INDIAN JOURNAL OF DERMATOLOGY VENEREOLOGY & LEPROLOGY Volume: 77 Issue: 2 Pages: 128-134 Published: MAR-APR 2011.
9. Charlier, Roger H.; Chaineux, Marie-Claire P.- The Healing Sea: A Sustainable Coastal Ocean Resource: Thalassotherapy, JOURNAL OF COASTAL RESEARCH Volume: 25 Issue: 4 Pages: 838-856 Published: JUL 2009.
10. Moss, Gloria A. - Water and health: A forgotten connection?, PERSPECTIVES IN PUBLIC HEALTH Volume: 130 Issue: 5 Pages: 227-232 Published: SEP 2010.

11. Sukenik, S; AbuShakra, M; Flusser, D - Balneotherapy in autoimmune disease, Conference: 10th Autoimmunity Meeting Location: CHAIM SHEBA MED CTR, TEL HASHOMER, ISRAEL Date: MAR 20, 1996 Sponsor(s): Israel Immunol Soc ISRAEL JOURNAL OF MEDICAL SCIENCES Volume: 33 Issue: 4 Pages: 258-261 Published: APR 1997.
12. Schuh, A.; Nowak, D. - Evidence-based acute and long-lasting effects of climatotherapy in moderate altitudes and on the seaside: a qualitative review, DEUTSCHE MEDIZINISCHE WOCHENSCHRIFT Volume: 136 Issue: 4 Pages: 135-139 Published: JAN 2011.
13. Iliescu, M. G.; Profir, D.; Surdu, O.; et al. - STATISTICAL VIEW THROUGH BALNEAL ACTIVITY IN TECHIRGHIOL MEDICAL AREA, JOURNAL OF ENVIRONMENTAL PROTECTION AND ECOLOGY Volume: 19 Issue: 1 Pages: 382-391 Published: 2018
14. Morer, Carla; Boestad, Cecilia; Zuluaga, Pilar; et al - Effects of an intensive thalassotherapy and aquatic therapy program in stroke patients. A pilot study, REVISTA DE NEUROLOGIA Volume: 65 Issue: 6 Pages: 249-256 Published: SEP 16 2017.
15. Katerusha, Olena; Matzarakis, Andreas,- THERMAL BIOCLIMATE AND CLIMATE TOURISM ANALYSIS FOR ODESSA, BLACK SEA, GEOGRAFISKA ANNALER SERIES A-PHYSICAL GEOGRAPHY Volume: 97 Issue: 4 Pages: 671-679 Published: DEC 2015.
16. Maraver, Francisco; Michan, Alfredo; Morer, Carla; et al. - Is thalassotherapy simply a type of climatotherapy?, INTERNATIONAL JOURNAL OF BIOMETEOROLOGY Volume: 55 Issue: 2 Pages: 107-108 Published: MAR 2011
17. Manuel Carbajo, Jose; Maraver, Francisco - Salt water and skin interactions: new lines of evidence, INTERNATIONAL JOURNAL OF BIOMETEOROLOGY Volume: 62 Issue: 8 Pages: 1345-1360 Published: AUG 2018.
18. Alen, Elisa; De Carlos, Pablo; Dominguez, Trinidad - An analysis of differentiation strategies for Galician thermal centres, CURRENT ISSUES IN TOURISM, Volume: 17 Issue: 6 Pages: 499-517 Published: 2014
19. Pereira, Leonel - Thalassotherapy and Marine Cosmeceuticals, THERAPEUTIC AND NUTRITIONAL USES OF ALGAE Pages: 503-522 Published: 2018.
20. Alvarez-Garcia, Jose; de la Cruz del Rio-Rama, Maria; del Mar Miras-Rodriguez, Maria - How Do Quality Practices Affect the Results?: The Experience of Thalassotherapy Centres in Spain, SUSTAINABILITY Volume: 9 Issue: 4 Article Number: 671 Published: APR 2017.
21. Karagulle, Zeki - Hydrotherapy, SPA, Balneotherapy, Thalassotherapy, Conference: 1st AntiAging and Aesthetic Medicine Congress Location: Antalya, TURKEY Date: NOV 06-09, 2008 , TURKIYE KLINIKLERI TIP BILIMLERI DERGISI Volume: 28 Issue: 6 Supplement: S Pages: S224-S229 Published: DEC 2008.
22. Kron, John - Water therapies, JOURNAL OF COMPLEMENTARY MEDICINE Volume: 6 Issue: 6 Pages: 46-50, Published: DEC 2007
23. Gomez Perez, C. P.; Gonzalez Soutelo, S.; Mourelle Mosqueira, M. L.; et al. - Spa techniques and technologies: from the past to the present, SUSTAINABLE WATER RESOURCES MANAGEMENT Volume: 5 Issue: 1 Special Issue: SI Pages: 71-81 Published: MAR 2019.
24. de la Cruz del Rio-Rama, Maria; Patricia Maldonado-Erazo, Claudia; Alvarez-Garcia, Jose - State of the art of research in the sector of thermalism, thalassotherapy and spa: A bibliometric analysis, EUROPEAN JOURNAL OF TOURISM RESEARCH Volume: 19 Pages: 56-70 Published: 2018.
25. Sanchez-Medina, Agustin J.; Naranjo-Barrera, Ylenia I.; Alonso, Jesus B.; et al. - Predicting Thalasso Tourist Delight: A Hybrid SEM-Artificial Intelligence Analysis, COMPLEXITY Article Number: 4329396 Published: 2018.
26. Palasciano, G.; Palmieri, V. O.; Moschetta, A.; et al. - Mediterranean lifestyle and thalassotherapy, EUROPEAN JOURNAL OF CLINICAL INVESTIGATION Volume: 41 Supplement: 1, Pages: 83-83, Published: APR 2011.
27. Taal, E; Zijlstra, TR; Van de Laar, MAFJ; et al. - Beneficial effects of a combined program of thalassotherapy, exercise and patient education in fibromyalgia are partially mediated by a reduction in passive pain-coping, Conference: Annual European Congress of Rheumatology Location: LISBON, PORTUGAL Date: JUN 18, 2003 ANNALS OF THE RHEUMATIC DISEASES Volume: 62 Supplement: 1 Pages: 553-553 Published: JUL 2003.
28. Aykroyd, B; Treuger, Y - Thalassotherapy: A gift from the sea, SOAP COSMETICS CHEMICAL SPECIALTIES, Volume: 74 Issue: 9 Pages: 26-27 Published: SEP 1998.
29. NOMURA, T - DEVELOPMENTAL PROJECT OF THALASSOTHERAPY IN THE JAPANESE COASTAL AREA, MARINE POLLUTION BULLETIN Volume: 23 Pages: 339-342 Published: 1991.
30. DELEDICQUE, AG - THALASSOTHERAPY IN RHEUMATOLOGY, REVUE DE MEDECINE Volume: 22 Issue: 36 Pages: 2269-2272 Published: 1981.