

The importance of balneo-physical-kinetic treatment in the elderly patients

The 73rd General Assembly and International Scientific Congress
“BALNEOLOGY IN CHANGING SOCIETIES”
Multilateral approach to health care and well-being
ITALY, November 3 - 6, 2022



Introduction

Romania is located in South-Eastern and Central Europe, North of the Balkan Peninsula, on the lower Danube, within and outside the Carpathian Mountains arch, bordering on the Black Sea.



Introduction

Balneal and Rehabilitation Sanatorium (BRST) is situated on the shore of Techirghiol Lake, near the Black Sea and was established over one century ago.



National - International addressability



The sanatorium gained its fame over the years, due to the great number of Romanian and foreign patients treated here with natural cure factors – salted water of the lake and sapropelic mud extracted from the lake.



SUA

Canada

Germania

Turcia

Moldova

Franța

Grecia

Italia

Belgia

Rusia



BALNEAL AND REHABILITATION SANATORIUM TECHIRGHIOI

The sanatorium has one of the most modern treatment facilities in the country.

Here, the patients are hospitalized across 3 different wards, on 2 different levels, each with a capacity of providing services up to 1,000 patients daily.



From 2007 → **PRESENT** it started a complete rehabilitation program and equipped with high performance medical equipment

Great addressability
~ 14.000 patients/year



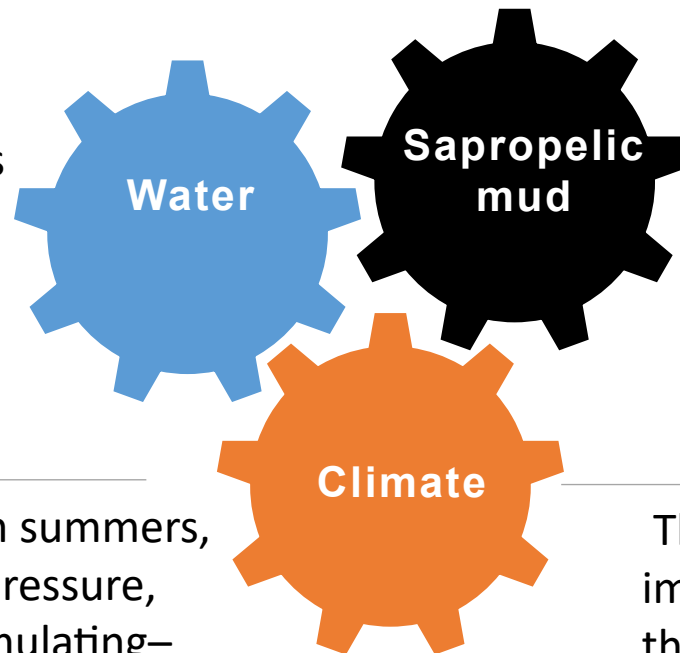
- **Hidrotherapy**
- **Thermotherapy**
- **Electrotherapy**
- **Phototherapy**
- **Masotherapy**
- **Kinetotherapy**
- **Inhalotherapie**
- The treatment base has a working capacity of up to 1000 patients daily and can offer over 6000 medical services per day.
- **Emergency room**

One of the most modern balneo-fizical –kinetic treatment bases from our country.

Therapeutic Factors



The lake water rich in chlorine, sulfur, bromine, sodium, magnesium as well as hypertonic is used in applications as general cold baths (lake immersion) or warm baths (in bath tubs or pools)



The mud is used for cold ointment , warm mud baths and hot packing

The Climate marine steppe with warm summers, cold winters and great differences in pressure, strong and frequent winds fits the stimulating–tonic bio climate group. In winter and summer this climate has a powerful exciting action over the body, action reduced in spring and autumn.

The proximity of Techirghiol lake is very important thus the ionization of the air, the richness in aerosols and the peloid resources from the bottom of the lake, which enriches the natural therapeutic arsenal of this area.



Therapeutic Factors





S.B.R. Techirghiol





S.B.R. Techirghiol





Sanatorium treatment methodology

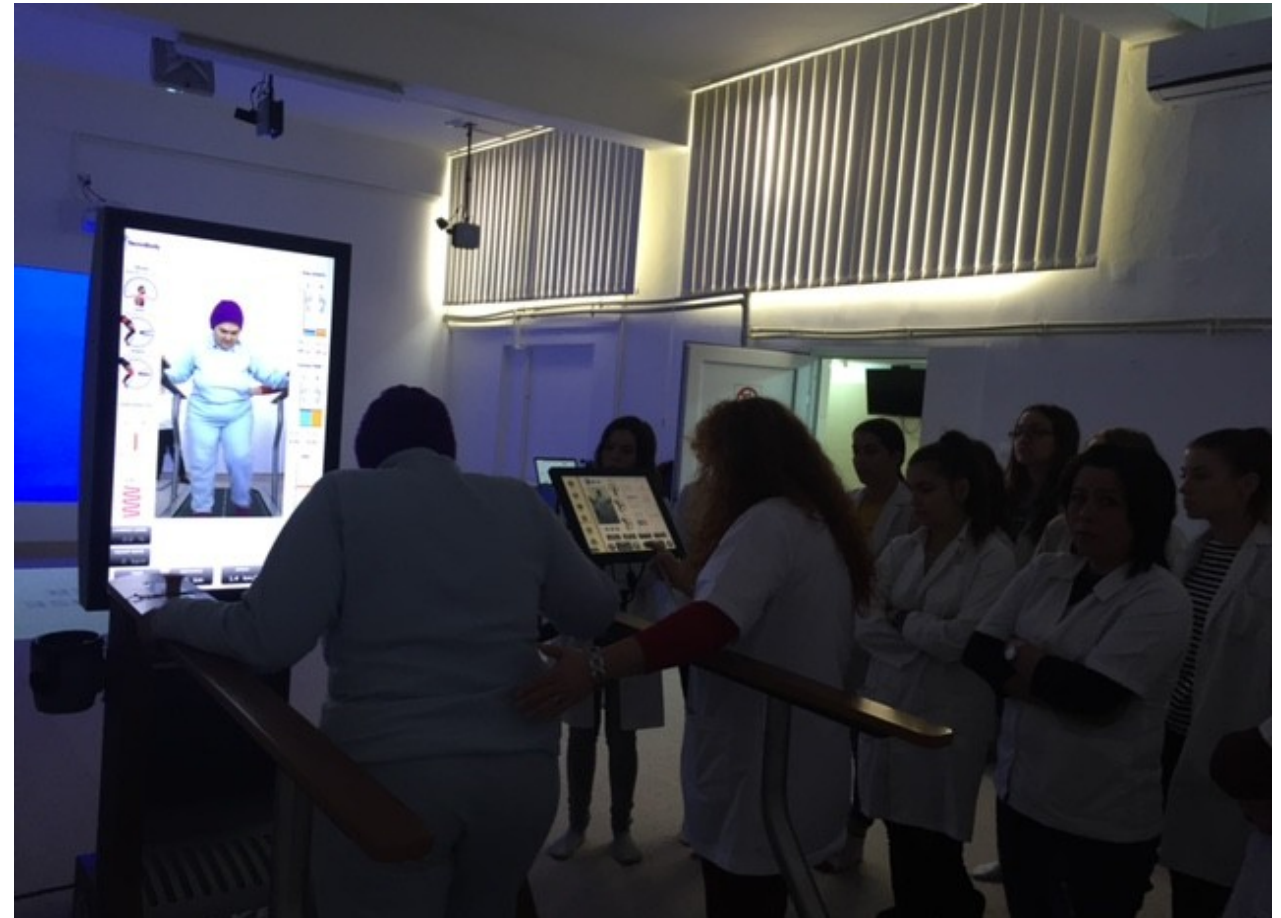




WALKER VIEW

Tecnobody – WalkerView

Cardiovascular training system, walking evaluation and reeducation





Intermittent vacuum therapy





DEEP OSCILLATION





SUPER INDUCTIVE SYSTEM

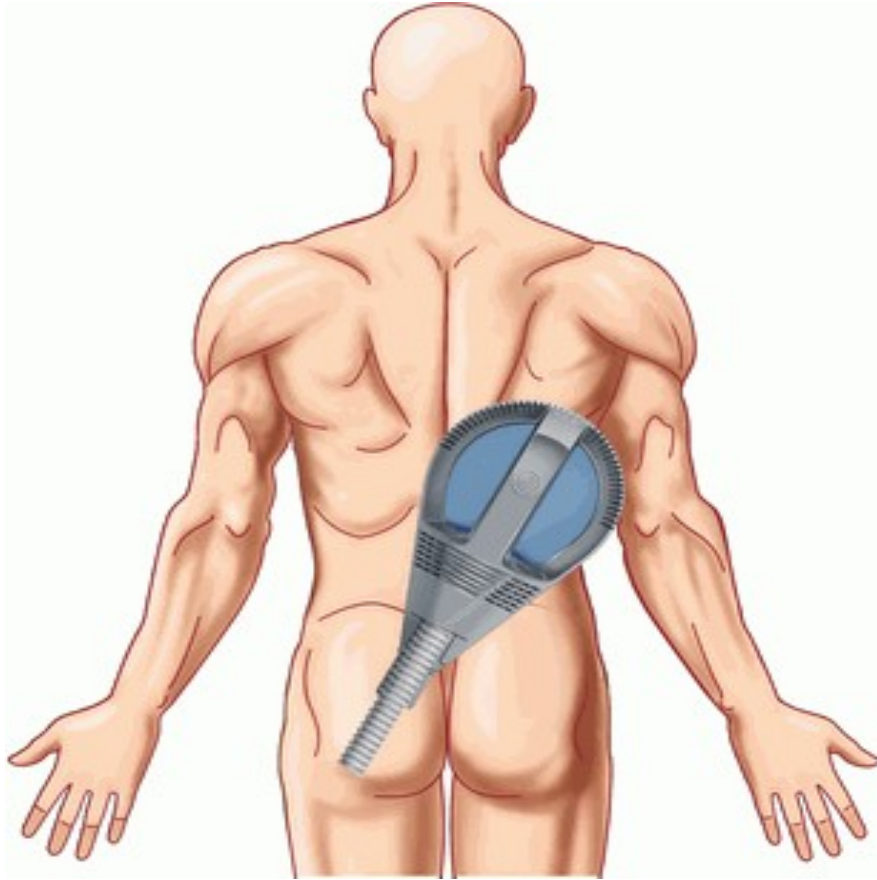
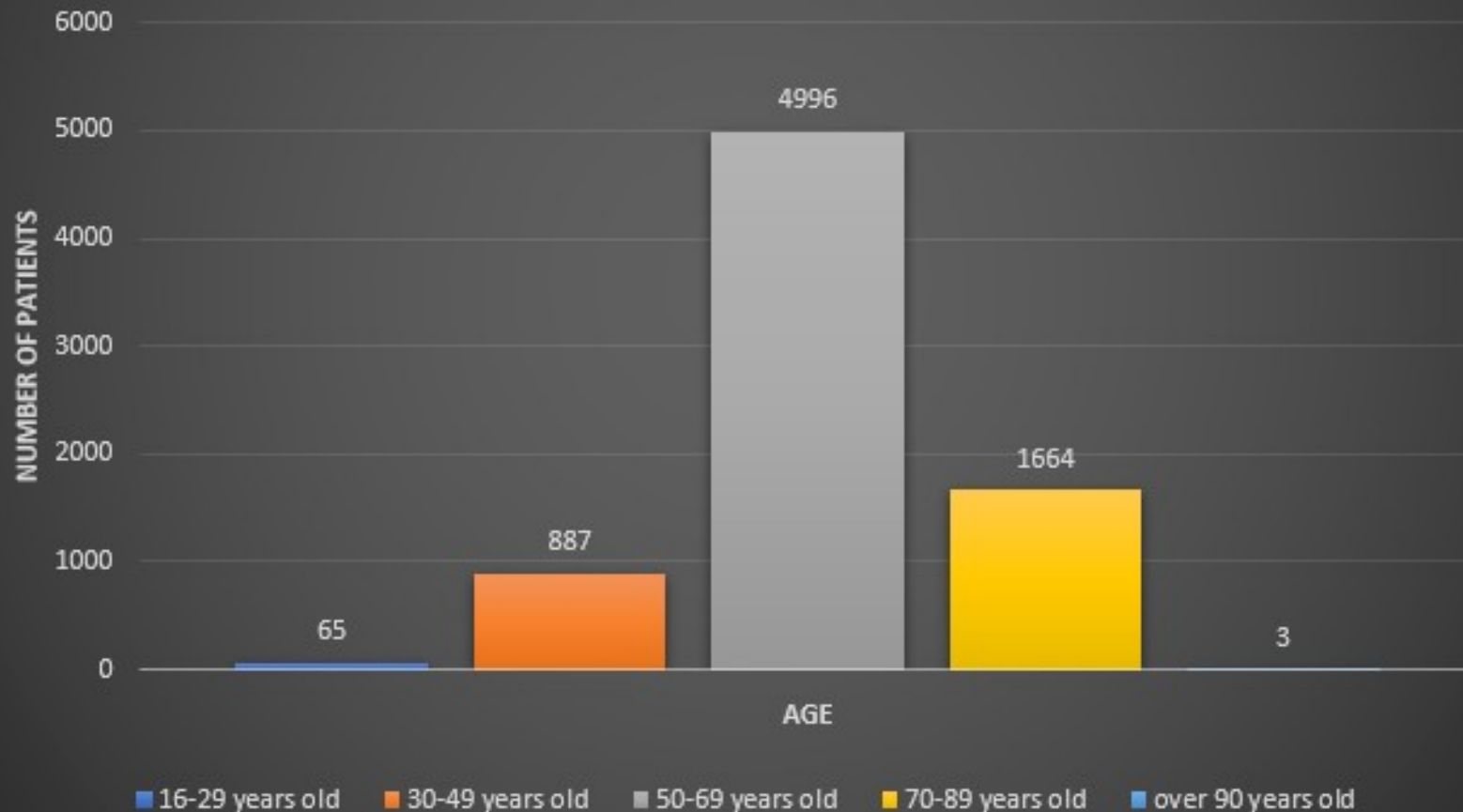
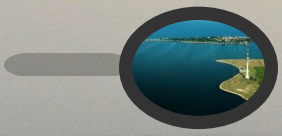




CHART WITH PATIENTS DISCHARGED FROM THE HOSPITAL -ADULTS- January-August 2022





HEALTHY AGEING

Healthy ageing means the optimisation of opportunities for a good general health condition, so that elders can play an active role in the society and enjoy a high and independent quality of life. The ageing of population is present in all geographic areas of the world and this results from the reduction of mortality and reduced fertility. The process entails the relative reduction of young population and an increase in the ratio of adult and old population.

- Aging is one of the most amazing biological processes.¹
- There are more than 300 theories that try to explain the phenomenon of aging from biological but also social perspective.²



Namolul sapropelic de Techirghiol si Imbatranirea

1. Romanian Journal of Endocrinology and Metabolism, vol. 7, no. 1, 2007, pg. 33

2. Trasca D.M., Studiul dinamicii hormonale pe axele corticotropa si tireotropa la varstnici , 2011, pg. 6



Neuroendocrine theory of aging was originally conceived in 1954 by the gerontology professor Vladimir Dilman.¹

The basis of this theory is that no part of the human body can act isolated from the nervous system and the endocrine system.^{2.3}

The most involved in this process are those that secrete hormones from the ovary (**estradiol**), from the testis (**testosterone**) , from the adrenal (**DHEA, cortisol**) and from the pituitary gland (**GH - growth hormone**).^o

1. Dilman Vladimir, Dean Ward. The Neuroendocrine Theory of Aging and Degenerative Disease. The Center for Bio- Gerontology Pensacola (1992).

2. Prada G.I., Geriatrie si Gerontologie, vol. I, Ed. Medicala, 2001

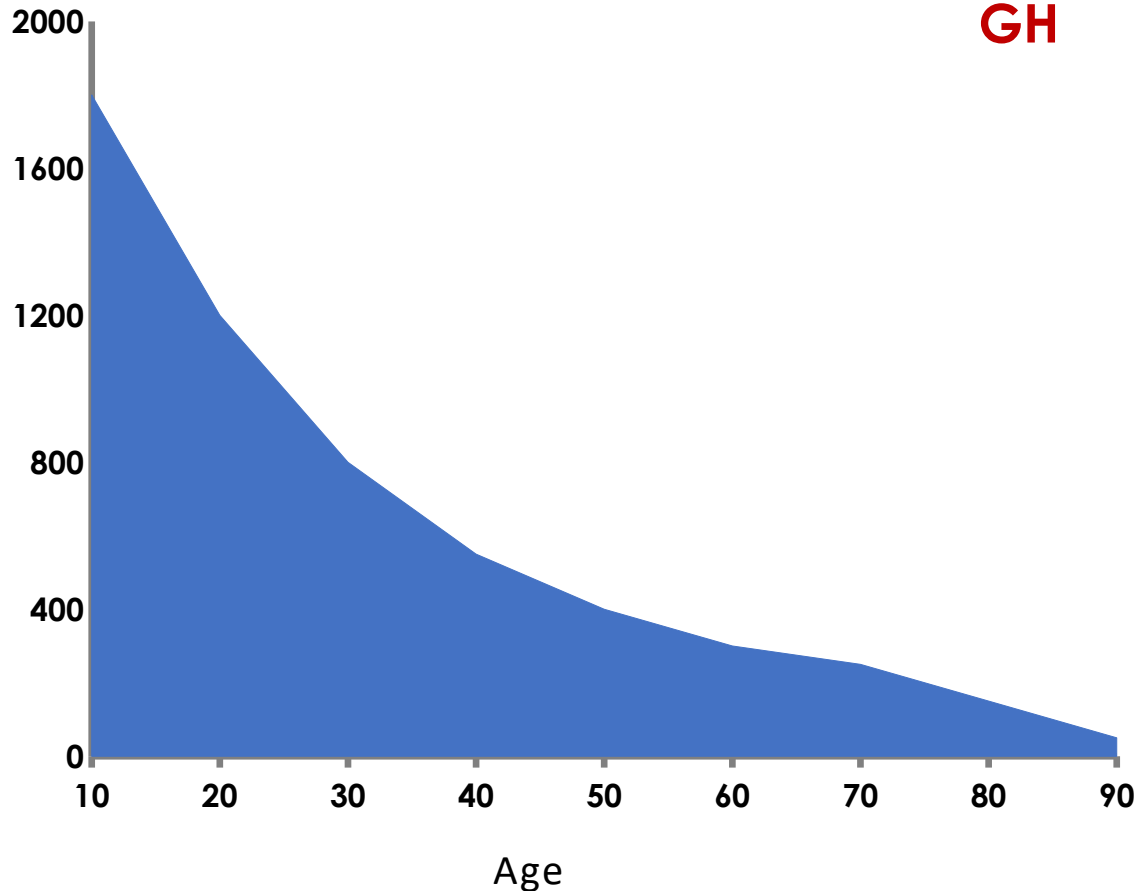
3. Susan L. M., Semiologie Medicala Geriatrica, Ed. Orizonturi Universitare, Timisoara, 2003

0. Romanian Journal of Endocrinology and Metabolism, Volume 7, no. 1, 2007, pg. 41



Theoretical premises

GH/ IGF-1



GH

- The one and only endocrine system for which there is a well-defined, sudden and universal change according to age is the hypothalamic-hypophyseal-gonadal axis at women ¹.
- The function of hormonal growth - insulin like growth factor 1 (IGF-1) system, the male hypothalamic-hypophyseal-gonadal and the portion (reticular area) in the adrenal cortex providing the synthesis of dehydroepiandrosterone, all these are subject to a progressive decline, along ageing at most people ¹.
- Normal values, adjusted according to age for serum IGF-1, total and free or bio-available testosterone and the dehydroepiandrosterone concentrations may be defined, but it is not known whether such values are physiologically optimal¹. The secretion of other hormones is also subject to changes with age, however changes are less predictable and there are not well-defined normal values adjusted with age ¹.

1. Harman SM, Cooper SD, Schmader EK et al. *Endocrine changes with aging*. UpToDate 2012.



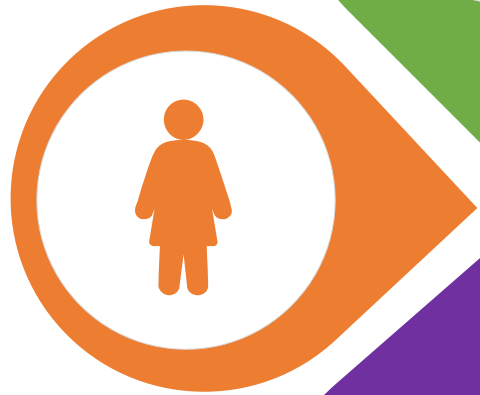
Theoretical premises

This paper focuses on the study of hypothalamic pituitary hormonal variations in the light of growth hormone (GH) in healthy elderly subjects, **GH-IGF-1 axis**.



STUDY INCLUSION CRITERIA

Older than 50

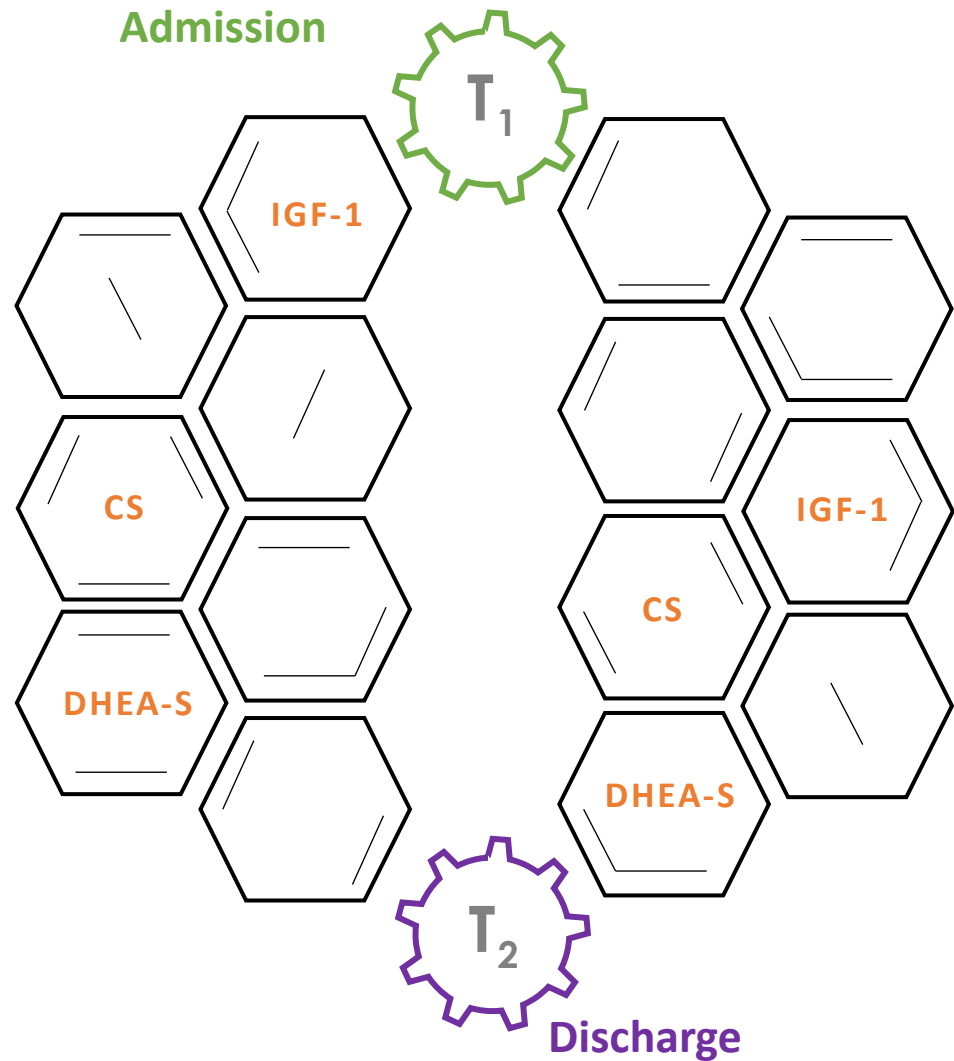


- patients older than 50,
with the correct indication of
balneal treatment, both women
and men, admitted to SBRT;

- patient with algic
symptoms of mechanical,
degenerative nature, at axial and
peripheral joint level, without
medication



The study main objective



Assessment of endocrine changes in the hypothalamic-hypophyseal axis as biological aging index, under peloidotherapy



Material and method

Batch 1- Peloid thermic neutral applications

37 patients

-The adaptative body response to thermoneutral peloidotherapy

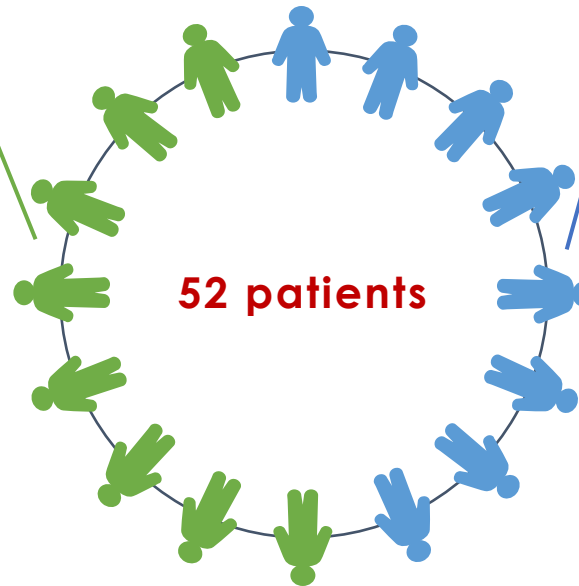
Batch 1: carried out 5 peloid thermic neutral applications / general mud baths (BN), alternatively with 5 general saline baths (BS), 3 additional electric procedures, one regional massage therapy session per day and one kinetotherapy session per day.

Batch 2 –Mud onction

15 patients

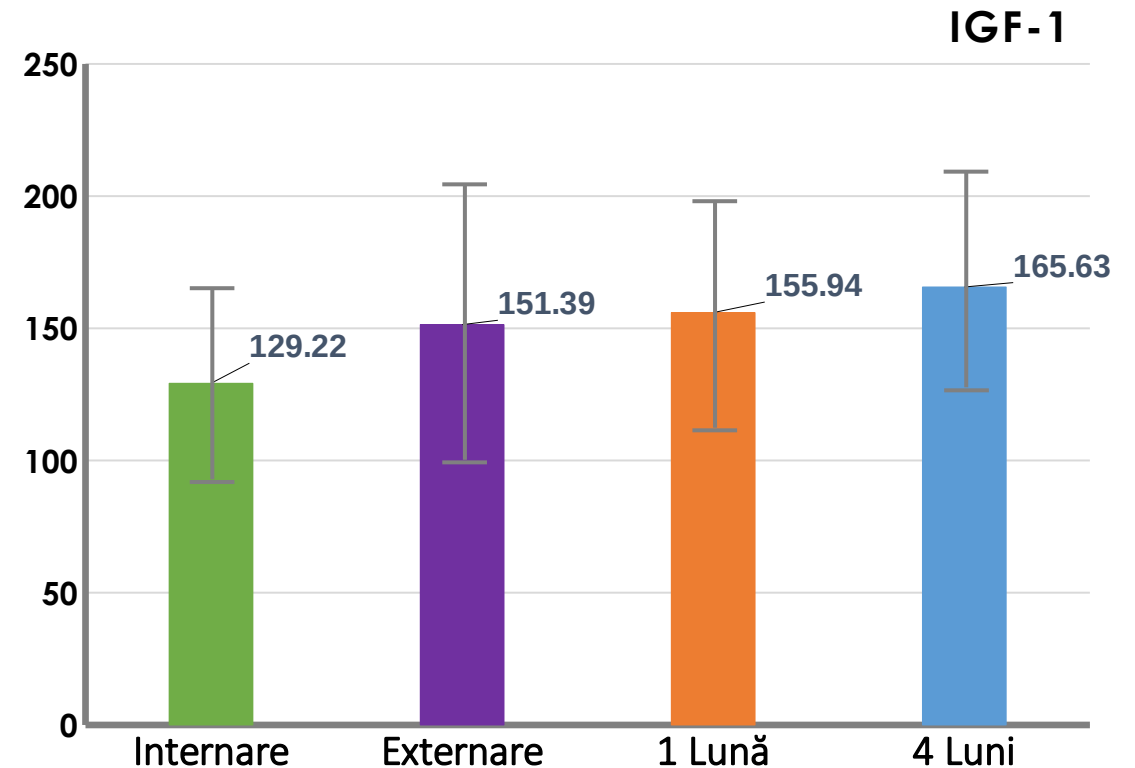
- The adaptative body response to contrasting peloidotherapy

Batch 2: carried out 10 mud applications as mud onction - therapy with contrasting factors (general progressive sun therapy, mud onction, immersion in the lake) during summer, 3 additional electric procedures per day, one regional massage therapy session per day and one kinetotherapy session



THERAPY WITH CONTRASTING FACTORS

For the batch carrying out **COLD MUD BATHS**, the results showed a statistically significant growth ($p=0.044$) of **IGF-1**, the variation of this hormone demonstrating the positive effect of the balneal treatment with contrasting factors in the biological ageing process. The IGF-1 low activity is associated with a significant morbidity in adults, with a high risk of cardiovascular diseases, diabetes, osteoporosis and neurodegenerative diseases, with certain implication in ageing modulation. There is one hypothesis that maximum human life expectancy depends on the strict regulation of the GH-IGF axis and on maintaining the optimal action of IGF-1¹. The optimal activity of this hormonal axis is involved both in the extension of life expectancy and in the increased resistance to the oxidative stress².

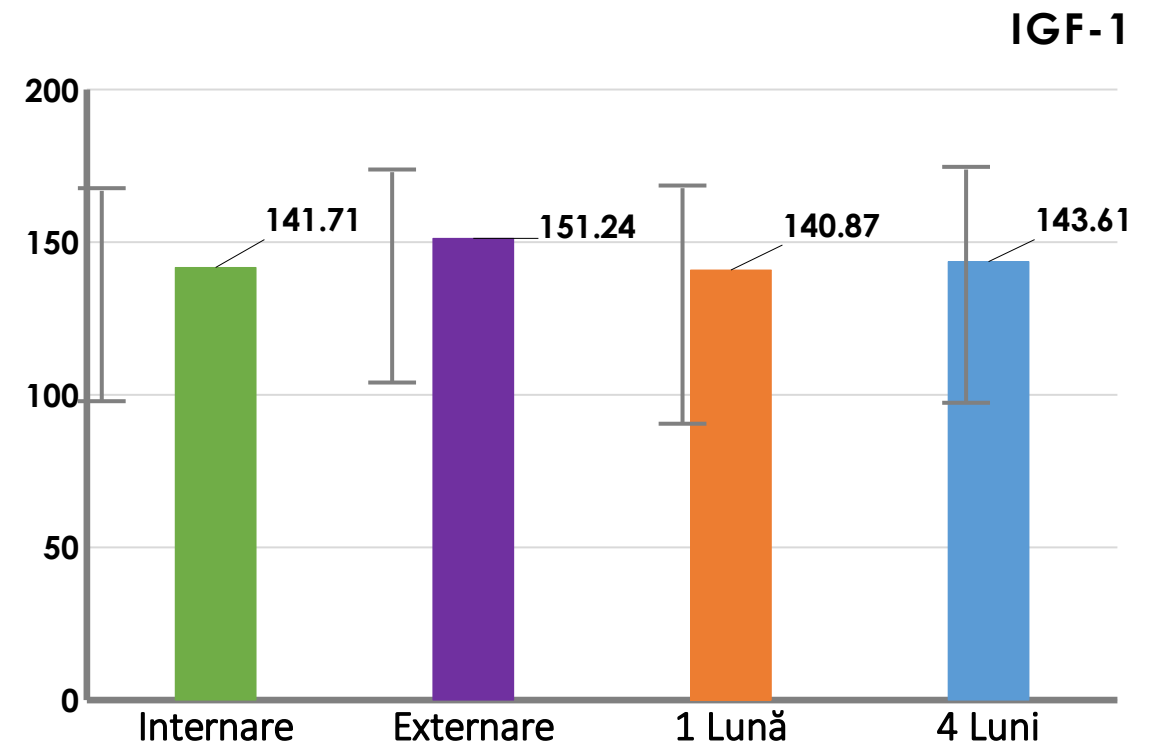


1. [Yang J, Anzo M, Cohen P.](#) Control of aging and longevity by IGF-I signaling. [ExpGerontol.](#) 2005 Nov;40(11):867-72.
2. [Brown-Borg HM.](#) Hormonal regulation of aging and life span. [Trends EndocrinolMetab.](#) 2003 May-Jun;14(4):151-3.

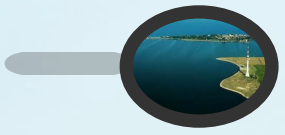
Results

THERMIC NEUTRAL APPLICATIONS

For the batch carrying out **WARM MUD BATHS**, the results showed an increase of **IGF-1** close to the statistical significance ($p=0.067$). Increasing tendency at the time of discharge, however not at statistically significant values, observed during the peloidotherapy with thermal contrast shows, as a whole, the general positive effect of the balneal treatment in the ageing process. I believe that additional studies including a higher number of participants are necessary for statistical validation. It must be mentioned that, within both study batches, the hormonal variation is within physiological limits, in the optimal hormonal function, being known that high levels of IGF-1 were connected by some studies to the risk of cancer, given the role of this hormone in the facilitation of normal and malign tissue growth¹.



1. [Yang J, Anzo M, Cohen P.](#) Control of aging and longevity by IGF-I signaling. [ExpGerontol.](#) 2005 Nov;40(11):867-72.



Conclusions- hormonal status



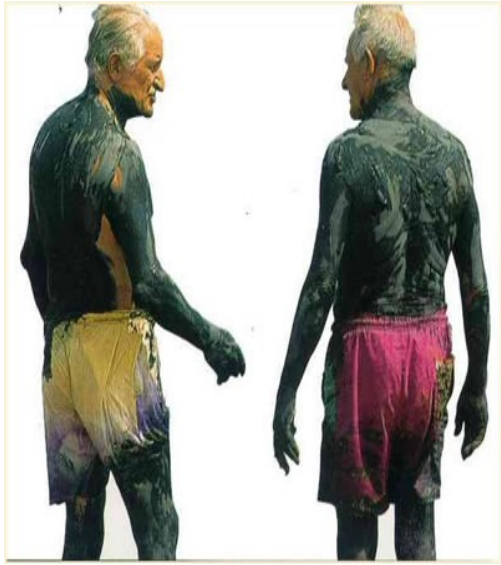
- The beneficial effects of the balneal treatment with Techirghiol sapropelic mud include the changes in the hormonal secretions, with a positive effect on the control of some biological aging processes.
- The results of the study confirm different bio-hormonal changes for several of the variables analysed comparatively between cold baths (contrasting factors) and warm baths (thermally neuter application), respectively, with Techirghiol sapropelic mud, however within the physiological secretion limits.



Balneal and Rehabilitation Sanatorium Techirghiol

Thanks to the fame gained with more than 100 years of activity in the balneal field, as well as the current medical research that is being developed, BRST presents an increased addressability. This classifies BRST as the top of medical units in Romania.





Thank you for your attention !

