Recent Medical Balneology and Spa Therapy Research

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Resent Research

Clinical effectiveness

- SPA THERAPY AND BALNEOTHERAPY
- DO THEY WORK?

?

Mechanisms of effect

- HOW DO THEY WORK?

?

Clinical effectiveness

International Journal of Biometeorology
pp 1–12 | Cite as

Real-life effectiveness of spa therapy in rheumatic and musculoskeletal diseases: a retrospective study of 819 patients

Authors | Authors and affiliations

Mine Karagülle, Sinan Kardeş, Müfit Zeki Karagülle

Original Paper
First Online: 30 May 2017

Objective

- To determine the real-life effectiveness of spa therapy in patients with a wide spectrum of rheumatic diseases in daily clinical practice

Method

- All adult patients with rheumatic diseases who were prescribed a spa therapy course in various spa resorts across Turkey between 2002 and 2012 were analyzed.
- These patients were assessed by a physician at the department, within a week before and after the spa therapy.

- Intervention:
- Spa therapy has usually been prescribed as two balneotherapy sessions (10–30 min at 38–40 °C) everyday for 2 weeks.

Forsch Komplementarmed Klass Naturheilkd. 2004 Feb;11(1):33-41.

[Balneotherapy and spa therapy of rheumatic diseases in Turkey: a systematic review].

[Article in German]

Karagülle MZ[1], Karagülle M.

Method

Outcome measures: According to the diagnosis

- Pain intensity (VAS)
- Patient's Global Assessment (VAS)
- Physician's Global Assessment (VAS)
- Health Assessment Questionnaire (HAQ)
- Western Ontario and McMaster U.I. (WOMAC)
- Lequesne Algofunctional Index (LAFI)
- Waddell Disability Index (WDI)
- Neck Pain and Disability Scale (NPAD)
- Shoulder Disability Questionnaire (SDQ)
- Fibromyalgia Impact Questionnaire (FIQ)
- Beck Depression Inventory (BDI)

Results

819 patients

Age (years)	58.8±11.9
Sex, n (%) -Female -Male	 589 (71.9%) 230 (28.1%)
Weight (kg) Height (cm) Body mass index (kg/m^2)	74.0±12.75 162.6±8.2 28.0±4.5

The data are expressed as mean ± standard deviation, unless otherwise indicated

Degenerative Joint Diseases	Number of patients (%)
-One Joint Site Osteoarthritis	
Knee Osteoarthritis	**131 (16.0%)**
Lumbar Osteoarthritis	63 (7.7%)
Cervical Osteoarthritis	51 (6.2%)
Hip Osteoarthritis	14 (1.7%)
Hand Osteoarthritis	1 (0.1%)
-Multiple Joint Sites Osteoarthritis	
Generalized Osteoarthritis	**214 (26.1%)**
Knee and Lumbar Osteoarthritis	27 (3.3%)
Knee and Cervical Osteoarthritis	13 (1.6%)
Lumbar and Cervical Osteoarthritis	11 (1.3%)
Hip and Lumbar Osteoarthritis	6 (0.7%)
Knee and Hip Osteoarthritis	3 (0.4%)
Hip and Cervical Osteoarthritis	2 (0.2%)
Subtotal	**536 (65.4%)**

Soft Tissue Rheumatism	Number of patients (%)
-Widespread Pain Disorders	
Fibromyalgia	115 (14.0%)
-Regional Pain Disorders	
Lumbar disc herniation	50 (6.1%)
Cervical disc herniation	34 (4.2%)
Rotator cuff tendinitis	9 (1.1%)
Stenosing flexor tenosynovitis	2 (0.2%)
de Quervain tendinopathy	1 (0.1%)
Subtotal	**211 (25.8%)**

Inflammatory Joint Diseases	Number of patients (%)
Ankylosing spondylitis	22 (2.7%)
Rheumatoid arthritis	16 (2.0%)
Psoriatic arthritis	1 (0.1%)
Subtotal	**39 (4.8%)**

Other Rheumatic Diseases	Number of patients (%)
Nonspecific low back pain	23 (2.8%)
Congenital hip dislocation in adult	2 (0.2%)
Osteoporosis	1 (0.1%)
Scoliosis	3 (0.4%)
Fracture rehabilitation	1 (0.1%)
Diffuse idiopathic skeletal hyperostosis	1 (0.1%)
Vasculitis (Behçet's Disease)	2 (0.2%)
Subtotal	**33 (4.0%)**

Spa resort	Total mineralization, main constituents of spa waters	N (%)
Gönen, Balıkesir	**1796 mg/L rich in sodium, sulfate, bicarbonate, chloride, fluoride**	**463 (56.5)**
Karahayıt, Denizli	**3257 mg/L rich in carbon dioxide, calcium, sulfate, bicarbonate, fluoride**	**160 (19.5)**
Bursa	**567 mg/L rich in sodium, calcium, magnesium, bicarbonate, metasilicate**	**38 (4.6)**
Afyon	1713 mg/L rich in sodium, sulfate, bicarbonate, fluoride, metasilicate	35 (4.3)
Balçova, Izmir	1571 mg/L rich in sodium, bicarbonate, metasilicate	30 (3.7)
Tuzla, Istanbul	3367 mg/L rich in sodium, calcium, chloride, bicarbonate, sulfate	27 (3.3)
Bolu	1744 mg/L rich in calcium, sulfate, bicarbonate, carbon dioxide, fluoride, metasilicate	23 (2.8)
Yoncalı, Kütahya	806 mg/L rich in calcium, magnesium, sulfate, bicarbonate, fluoride	12 (1.5)
Other resorts	Edremit Balıkesir; Aydın; Ankara; Kuzuluk Adapazarı; Armutlu Yalova; Havza Samsun; Kozaklı Nevşehir; and Tokat	31 (3.8)
Total		819 (100)

Spa resorts


Tuzla,Istanbul
Bolu
Gönen, Balıkesi
Bursa
Yoncalı, Kütahya
Balçova, Izmir
Afyon
Karahayıt, Denizli
KARA
DENİZ
GÜRCİSTAN
EDİRNE
TEKİRDAĞ
İSTANBUL
YUNANİSTAN
BULGARİSTAN
Havza
TRABZON
KARS
ERMENİSTA
YOZGAT
ERZURUM
AĞRI
SİVAS
ERZİNCAN
KIRŞEHİR
KAYSERİ
NEVŞEHİR
KONYA
DOĞU ANADOLU FAYI
MUŞ
VAN
Elbistan
DİYARBAKIR
IRAK
EGE DENİZİ
ANTALYA
MERSİN
HATAY
SURİYE
AK DENİZ
AÇIKLAMALAR
Önemli Jeotermal Alanlar
İçmece
Sıcak Su Kaynakları
Maden Suy
Ü. Tersiyer-Kuvaterner Volkanitler
Ü. Tersiyer-Kuvaterner Volkan Çıkışları
Ana Fay Hatları
Başlıca Doğrultu Atımlı Faylar
Ters Fay ve Bindirmeler
0 50 100 km
ÖLÇEK
Ş. Şimşek 2001

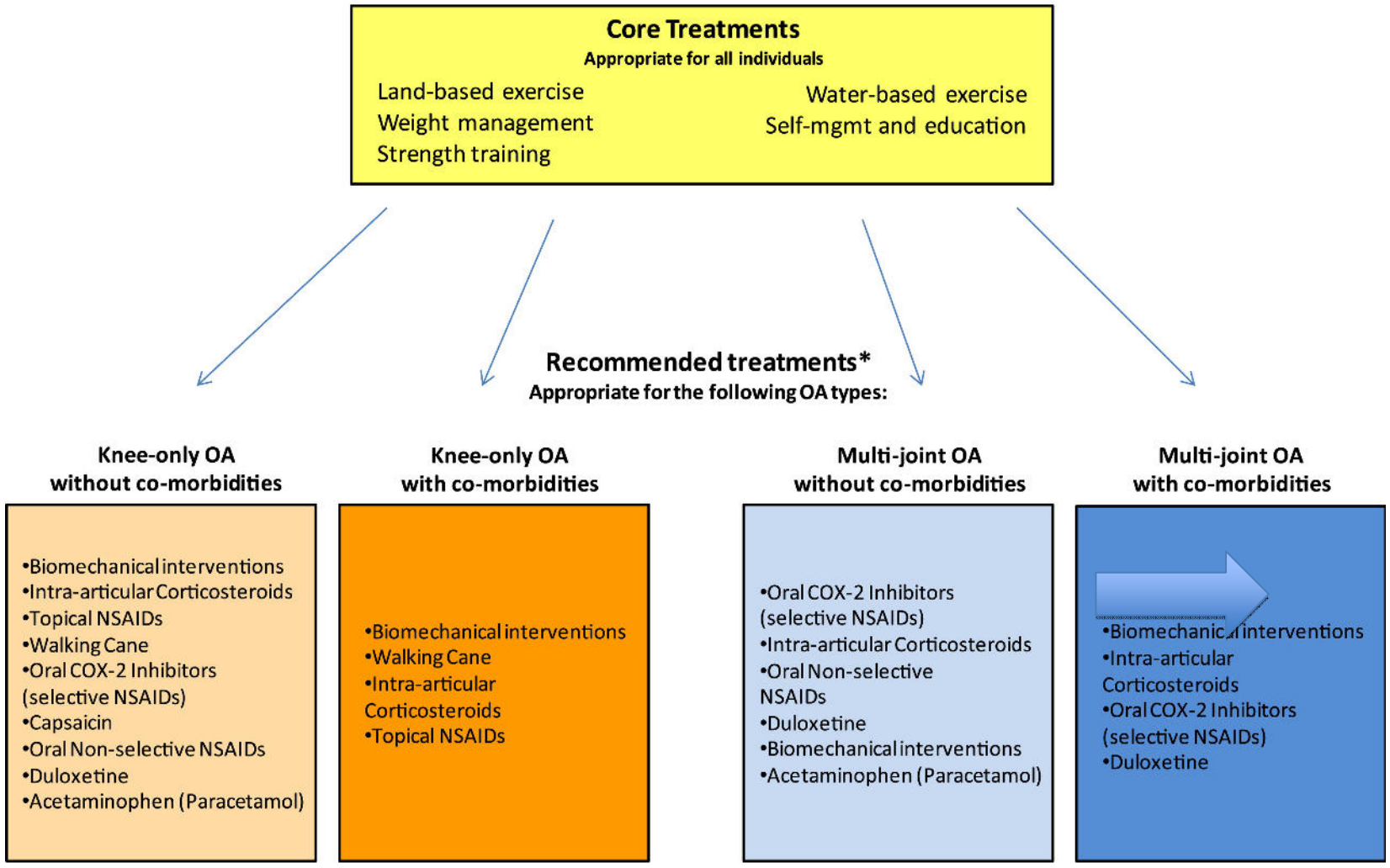
Results

- Statistically significant **decrease in pain** was found in all patients except hip osteoarthritis (p=0.063) and rheumatoid arthritis (p=0.134) subgroups;
- Statistically significant **improvement in function** in all patients except hip osteoarthritis (p=0.068), rheumatoid arthritis (p=0.111) and rotator cuff tendinitis (p=0.078) subgroups.

Conclusions

- In daily clinical practice, spa therapy is prescribed mainly for degenerative joint diseases, than for soft tissue rheumatisms; and less frequently for inflammatory joint diseases.
- In real-life spa therapy is effective in rheumatic diseases by soothing pain and improving function.
- Further studies are needed to document the real-life use and effectiveness of spa therapy in other disciplines.

OARSI Guidelines for the Non-surgical Management of Knee OA



*OARSI also recommends referral for consideration of open orthopedic surgery if more conservative treatment modalities are fo und ective.

Osteoarthritis and Cartilage 2014 22, 363-388DOI: (10.1016/j.joca.2014.01.003)

Clinical effectiveness

International Journal of Biometeorology
pp 1–11 | Cite as

Spa therapy adjunct to pharmacotherapy is beneficial in rheumatoid arthritis: a crossover randomized controlled trial

Authors | Authors and affiliations

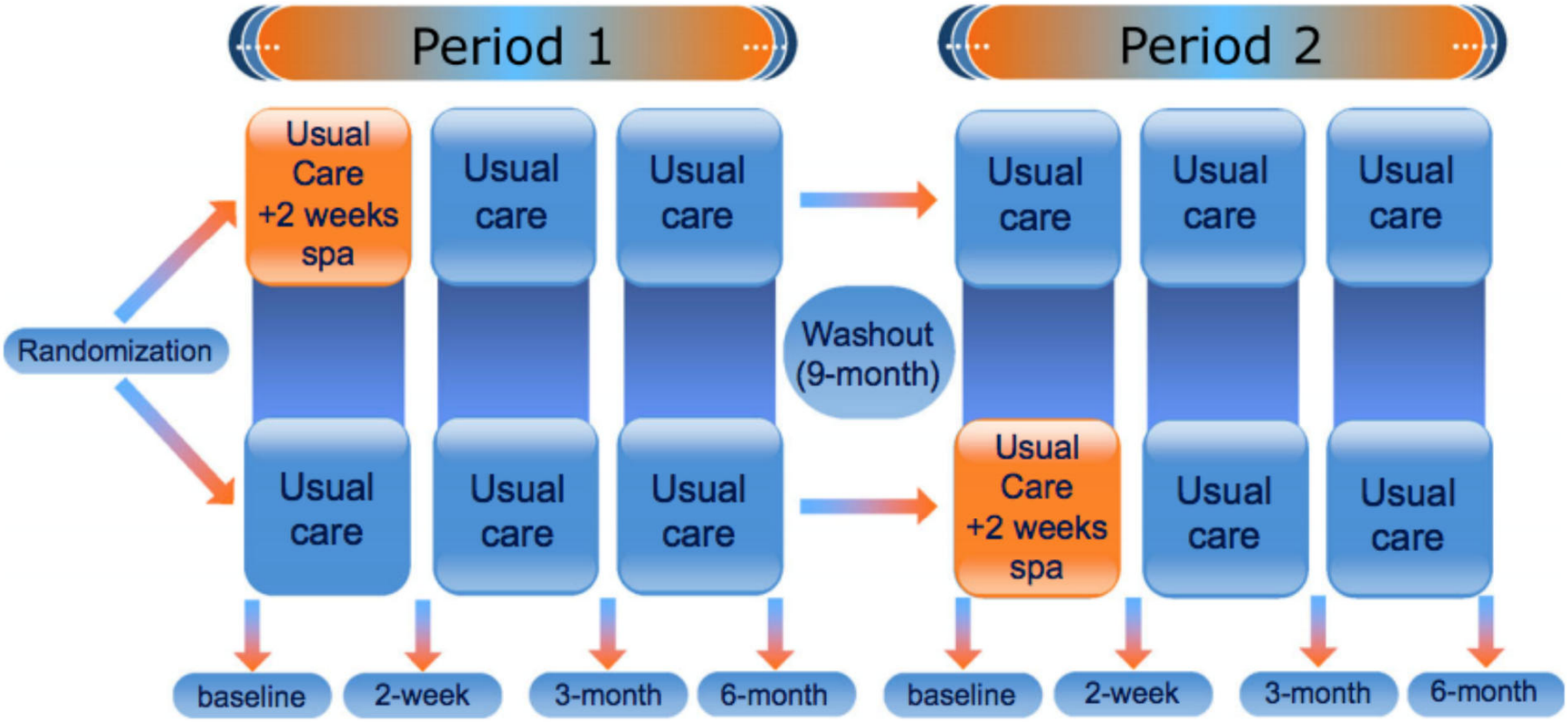
Mine Karagülle ✉, Sinan Kardeş, Rian Dişçi, Müfit Zeki Karagülle

Original Paper
First Online: 07 September 2017

Objective

- To investigate whether 2-week spa therapy, as an adjunct to usual pharmacological therapy, has any beneficial effect in patients with rheumatoid arthritis treated with conventional DMARDs.

Method



50 patients were randomized to receive usual pharmacological therapy plus 2-week spa therapy or usual pharmacological therapy alone (period 1, 6 months); after a 9-month washout, patients were crossed over to the opposite assignment (period 2, 6 months).

Intervention

- The spa therapy was carried out at Tuzla Spa, near Istanbul.
- It consisted a daily saline balneotherapy session at 36–37 °C for 20 min except Sundays.
- The spa water has a total mineralization of 3367 mg/L, and is saline water with a high concentration of sodium chloride (1900 mg/L), and also includes relatively low concentration of calcium and magnesium.

Results

- Spa therapy was superior to control therapy in improving all the assessed clinical outcomes in short term *(at the end of the spa therapy)*.
- This superiority persisted significantly in several outcomes in long term at 3 and 6 months.

Conclusion

- A 2-week spa therapy, as an adjunct to usual pharmacological therapy, provided beneficial clinical effects in immediate, short, and medium terms up to 6-month compared to usual pharmacological therapy alone, in RA patients treated with conventional DMARDs.

Clinical effectiveness

International Journal of Biometeorology
April 2017, Volume 61, Issue 4, pp 719–728 | Cite as

Balneological outpatient treatment for patients with knee osteoarthritis; an effective non-drug therapy option in daily routine?

Authors Authors and affiliations

Kağan Özkuk ✉, Hatice Gürdal, Mine Karagülle, Yasemin Barut, Rıza Eröksüz, Müfit Zeki Karagülle

Original Paper
First Online: 07 October 2016

Objective

- To compare the consecutive versus intermittent course of balneological outpatient treatment provided by the Department of Medical Ecology and Hydroclimatology Outpatients Balneology Unite
- in patients with knee osteoarthritis

Method

- 50 patients with knee osteoarthritis were randomized either:
- Consecutive (each weekday for 2 weeks, 10 applications in total)
- Intermittent (2-times per week for 5 weeks, 10 applications in total) course.

Balneological Interventions

- Hydrotherapy: is applied as head-out immersion in a tap water pool at 36-38 °C for 20 min.
- Peloidotherapy: is applied as local medicinal peloid pack on the knee joint at 42-43°C for 20 min.
- Are provided in our university hospital setting and are being reimbursed by the social health care insurance system in Turkey.


Hydrotherapy: is applied as head-out immersion in a tap water pool at 36-38 °C for 20 min.

Peloidotherapy: is applied as local topical peloid pack on the knee joint at 42-43°C for 20 min.

Conclusion

- Consecutive and intermittent balneological treatment
- are found effective
- have similar efficacy
- in patients with knee osteoarthritis.

Mechanisms of effect

International Journal of Biometeorology
January 2017, Volume 61, Issue 1, pp 169–180 | Cite as

Effect of spa therapy with saline balneotherapy on oxidant/antioxidant status in patients with rheumatoid arthritis: a single-blind randomized controlled trial

Authors | Authors and affiliations

Mine Karagülle, Sinan Kardeş, Oğuz Karagülle, Rian Dişçi, Aslıhan Avcı, İlker Durak, Müfit Zeki Karagülle

Original Paper
First Online: 21 June 2016

- This study is a part of the crossover trial.

Objective

- To investigate whether spa therapy with saline balneotherapy has any influence on the oxidant/antioxidant status in patients with rheumatoid arthritis.

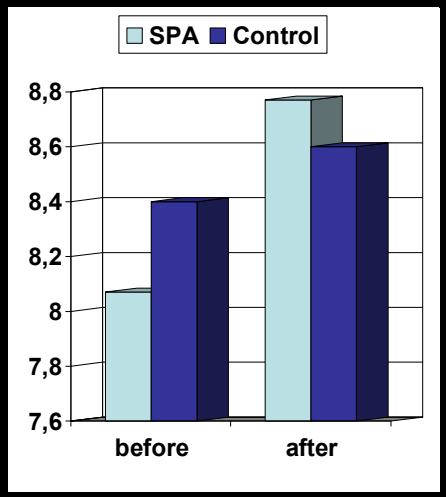
Oxidant/antioxidant status parameters

- Malondialdehyde (MDA) is an end product of lipid peroxidation and the potent marker of oxidative stress.
- Superoxide dismutase (SOD) is a first line of defense against oxidative stress, by turning superoxide radical anion to hydrogen peroxide.
- Antioxidant potential (AOP) reflects the total capacity of the enzymatic and nonenzymatic antioxidant systems collectively.
- Nonenzymatic superoxide radical scavenger activity (NSSA) reflects the total capacity of the nonenzymatic antioxidant systems collectively.

Results

- The NSSA levels were increased significantly in the spa group; and there was a trend in favor of spa therapy for improvements in NSSA levels compared to control.

Nonenzymatic Superoxide Radical Scavenger Activity (NSSA) U/mL



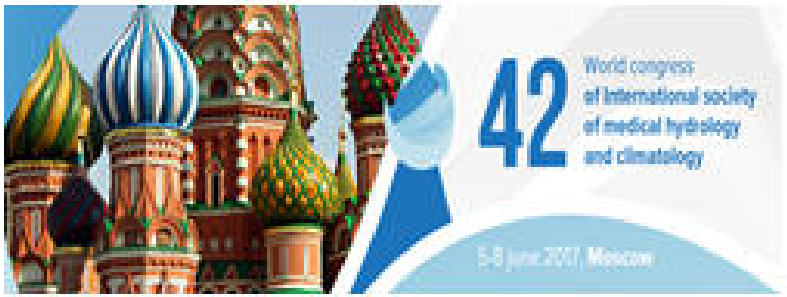
After 2-week spa therapy;

- increased in both groups
- Statisticaly significant increase in SPA group ($p<0,05$)

Conclusion

- Spa therapy with saline balneotherapy exerts anti-oxidant effect in patients with RA as reflected by the increase in NSSA levels after spa therapy.

Mechanisms of effect



In vitro evaluation of natural thermal mineral waters in HaCaT cells

**Müfit Zeki Karagülle[1], Murat Türkoğlu[2], Son
Hakan Sevinç[2], Mine Karagülle[1] and Cihat**

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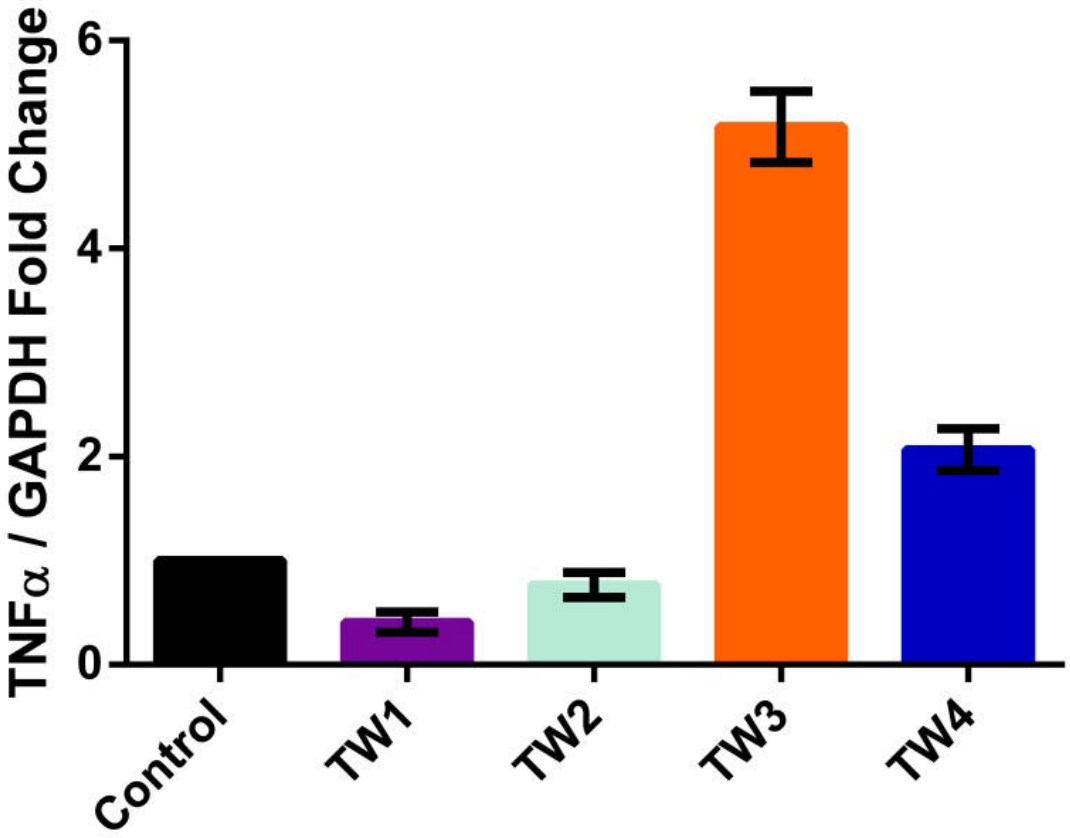
Mechanisms of effect

- We aimed to test four different natural mineral waters with known chemical composition at the cellular level to determine their anti-inflammatory and angiogenic properties in human keratinocyte cells (HaCaT) *in vitro.*

Results; TNF-α

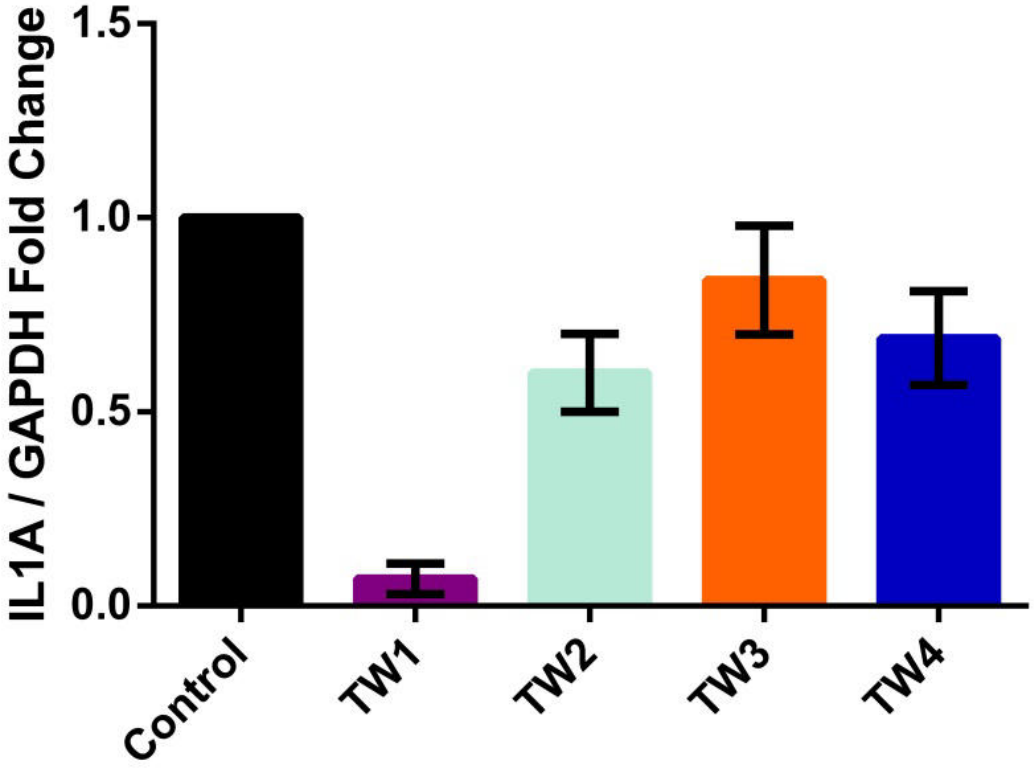
- TW1 and TW2 significantly down regulated, whereas
- TW3 and TW4 up regulated the expression of Tumor Necrosis Factor Alpha (TNF-α)



(0.4123 and 0.7745 respectively; p<0,05)
(5.1789 and 2.0762; p<0,05)

Results; IL-1α

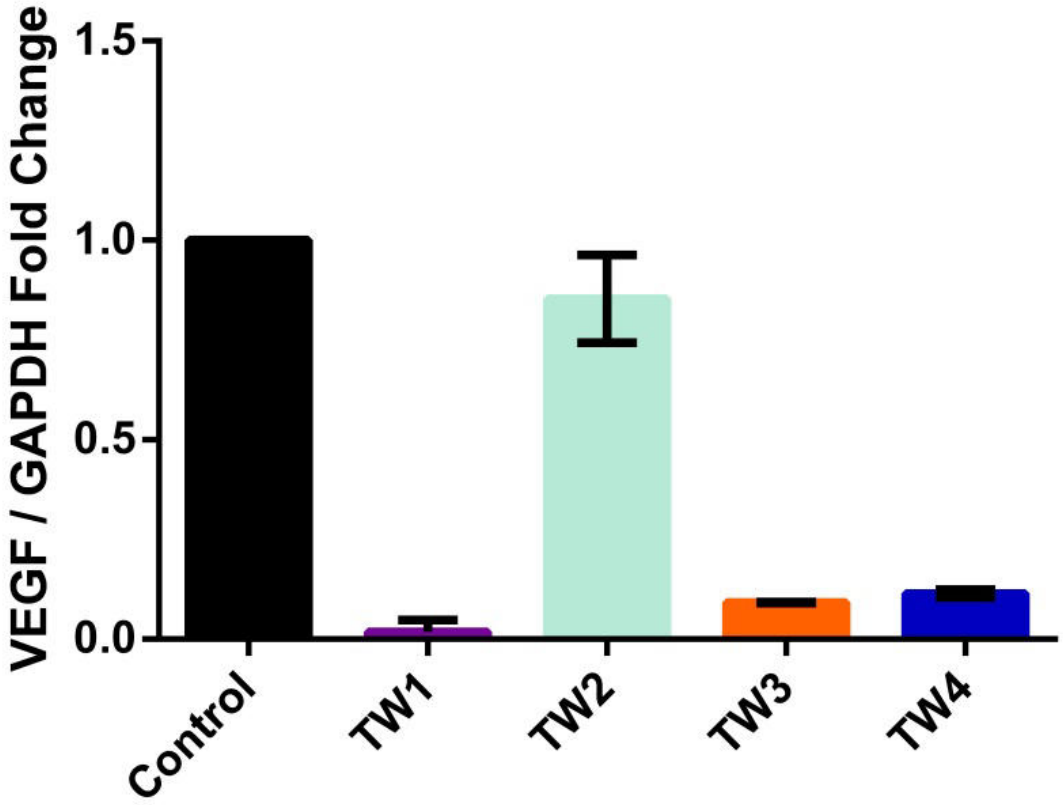
- All four tested thermal mineral waters decreased the expression of Interleukin 1-alpha (IL-1α) significantly
- The most prominent effect was seen by TW1



- (TW1 0.07; TW2 0.623; TW3 0.8974 and TW4 0.696; $p<0,05$).

Results; VEGF

- All waters showed downregulation of the gene expression of vascular endothelial growth factor (VEGF) significantly
- The most prominent effect was seem by TW1



- (0.018; 0.8526; 0.0918 and 0.1142 respectively; $p<0,05$).

Disscussion

- All tested waters exerted significant effects at the cellular level
- depending on their chemical content and/or levels they could either suppress or increase cytokines
  - significant downregulation of TNF-α has been found only with TW1 and TW2 mineral waters
  - whereas mineral waters TW3 and TW4 up regulated the expression of TNF-α
  - all four tested mineral waters decreased the expression of IL-1α
  - again all waters showed downregulation of the gene expression of VEGF significantly

Disscussion

- We hypothesize that the observed decrease in the gene expression of TNF-α was due to the specific chemical content of the TW2 (hydrogen sulfide) and TW1 (silica) and it can be taken as an anti-inflammatory effect on culture cells.
- Moreover suppressed VEGF expression that was found in a lesser or a greater extent with all waters might be indicating the antiangiogenic effect of waters on human keratinocytes

Conclussion

- These findings may give insight on the underlying mechanisms of the therapeutic benefit of balneotherapy observed in some skin diseases such as rosacea and psoriasis.
- In-vivo (animal and human) studies are needed to verify these findings.

Resent Research

Clinical effectiveness

- SPA THERAPY AND BALNEOTHERAPY
- DO THEY WORK?

YES

Mechanisms of effect

- HOW DO THEY WORK?

Anti-inflammatory & Anti-oxidant

Thank you for your attention!!

43rd World Congress of ISMH

13-16 June 2018, Amarante, Portugal