DANUBIUS HOTELS GROUP

CLINICAL STUDY SUMMARY FROM HÉVÍZ

INTRODUCTION

The aim of the trials was to study the effects of a course of bathing treatments in medicinal thermal water on patients suffering from muscular-skeletal diseases.

The treatment undertaken by the patients consisted of 15 sessions of bathing in thermal mineral water for a period of 30 minutes. This is referred to in this document as the 'balneologic' or bathing treatment. The completion of the treatments was recorded in a so-called 'hydro-log'.

The tests were performed by the largest spa hospital in the country (St Andrew State Rheumatism and Rehabilitation Hospital). Since the water from all Hévíz thermal wells is of practically identical composition, the Ministry of Health has granted the classification of 'medicinal water' to the water of all seven wells. (The registration number of the well supplying the Danubius Health Spa Resort (formally Danubius Thermal) is B-15.)

CLINICAL TRIAL CONDITIONS

	Men	Age	Women	Age
Arthrosis of the knee-joint	10	19-81	22	19-81
Lumbago	14	41-82	20	41-82

- The tests were performed in 2003.
- The tests were performed using water with a temperature of 36ºC.
- Taking into consideration a potential dropout, 40 patients suffering from spine ailment and 40 patients suffering from knee-joint ailment were enrolled into the trial.
- Only patients in pain, or who showed other muscular-skeletal symptoms such as joint swelling, dwindling motion path, etc, took part in the trial.
- X-ray photographs were taken and laboratory tests conducted.
- Whilst taking non-steroids was not a cause of exclusion for patients, attention was paid to whether their dosage of medications could be reduced or entirely stopped under the influence of the bathing treatments applied.
- A condition of participation in the four-month trial was that the patients would agree not to receive any other physiotherapy or treatment for their spine or joints.
- We did not involve in the investigation any patient currently receiving steroid treatment.
- When selecting patients, we naturally took into consideration that the bathing treatment should have no counter-indications.

OTHER IMPORTANT FACTORS

- Only Hungarian patients on state insurance were involved in the test. There is unfortunately no data detailing how long those examined had suffered from their complaints.

- There is no data regarding the lifestyle of the people examined.

- No placebo treatments were performed because the patients where specifically attending to receive effective treatment for their conditions.

CONDITIONS OF THE TREATMENT

Prior to the trial the patients read the patient information document and signed it together with a declaration of consent.

It was a technical condition that the patient should submit a so-called “minor laboratory finding” and an **X-ray photograph** of the problematic organ or its description. In the absence of that, we performed this in the hospital.

In order to record the pathological symptoms of both diagnoses before and after the treatment, and three months afterwards, we prepared assessment forms, which slightly differed from each other.

Besides a patient’s personal data, we recorded data of the patient’s muscular-skeletal disorder on the forms. Within pathological symptomatic parameters, we could assess the results **subjectively** (the patient’s and the doctor’s opinion of the patient’s condition and various forms of pain), **semi-objectively** (tenderness to pressure, measuring the different durations of walking, etc) and **objectively** – results which could not be influenced by the patient’s will – for example symptoms measured (instrumentally).

Prior to the balneologic treatment, we always briefed the patients on how the **Visual Analogue Scale** should be completed and kept.

The co-ordination of this number of patients in our experiment sometimes created difficulties, which explains why the balneologic treatment was not always commenced at the same time. However, in the case of every patient, the procedure of the examination before and after the treatment, and the **examination after three months**, was performed identically.

The final number of patients fully assessed was 34 patients suffering from backache and 32 patients suffering from knee-joint ailment; some did not return for the three-month follow-up examination.

RESULTS

Effects of the therapy on pain reduction:

The first question concerned whether the balneologic treatment reduced a patient's pain and how long this abatement of pain lasted. If we investigate the results of the statistics, the answer is unequivocal. Upon conclusion of the balneologic treatment, from among the 19 investigated pathological symptomatic parameters of patients suffering from backache, seven parameters were applicable to the patient's pain. All seven parameters indicated a significantly beneficial reduction. The Visual Analogue Scale indicated by the guest's experience confirmed it too.

If we perform the very same investigation in case of the patients suffering from knee-joint ailment, here again, of the eight parameters applicable to pain, all eight symptomatic parameters confirmed a significantly beneficial abatement of pain. The Visual Analogue Scale indicated by the guest's experience again confirmed it.

If we consider alterations in pain by investigating the findings of examinations before the treatment and three months afterwards, in the case of backache, from among the six parameters, all six symptomatic parameters significantly indicated a pain reduction. In the case of patients suffering from knee-joint ailment, all parameters applicable to pain showed a significantly beneficial improvement even after three months. If we consider the results of the examination immediately after the treatment and the follow-up three months later, from the aspect of pain, we can say that a nearly identical improvement is detectable in both groups of disease. From among the six symptomatic parameters of patients suffering from backache, only four parameters indicated abatement of the patient's pain; in the case of patients suffering from knee-joint ailment, there were also four symptomatic parameters that indicated abatement of the patient's pain. From these data, one could conclude that the greatest reduction in pain occurred mainly under the influence of the balneologic treatment. Although in the three months following the balneologic treatment, the patient's pain did not abate so much as directly after the balneologic treatment, the data relating to the three-months reduction of pain ultimately showed favourable values.

Effects of the therapy on range of movement:

If we thoroughly examine the data related to motion, in the case of the patients with backache, according to all three mathematical statistics (before and after treatment, before treatment and upon the three-months post-examination) from among the motion parameters, only rotation showed significant improvement. If we investigate the motion parameters of those suffering from knee-joint ailment (flexion, walking data, pace distance), improvement is detectable only in the case of flexion, and related to that, pace distance to a minor extent. The parameters of load walking showed no significant improvement. However the improvement of flat walking showed a favourable value.

Effects of the therapy on medication prescription:

A clear reply can be given to the question as to how the balneologic treatments influence the dosage of medication already set prior to the treatment. From among the 34 patients suffering from backache, 28 (82.35%) were on non-steroid medicated treatment; from among the 32 patients suffering from knee-joint ailment, 20 (62.5%) were on non-steroid

medicated treatment. From among the 28 patients suffering from backache who took medication, 19 (67.86%) stopped taking their non-steroid medications after the balneologic treatment. Likewise, from among the 20 patients suffering from knee-joint ailment, 15 (75%) entirely stopped taking their non-steroid medications. There was only one patient who, despite the balneologic treatment, still required medicated treatment.

Water Information:

Cation		**mg/l**	**Anion**		**mg/l**
Natrium	Na^{+}	27,00	Nitrat	NO_3^{-}	< 1,00
Kalium	K^{+}	7,1	Nitrite	NO_2^{-}	< 0,02
Litium	Li^{+}	0,02	Chloride	Cl^{-}	24,00
Ammonium	NH_4^{+}	0,32	Bromide	Br^{-}	0,10
Calcium	Ca^{++}	83,00	Jod	J^{-}	0,01
Magnesium	Mg^{++}	30,3	Fluoride	F^{-}	1,24
Ferrum	Fe	0,07	Sulphate	SO_4^{--}	50,00
Manganese	Mn^{++}	< 0,02	Hydrocarbonate	HCO_3^{-}	378,00
			Phosphate	PO_4^{---}	0,06
			Sulphide	S^{--}	4,8

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