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Original article

KNEE OSTEOARTHRITIS AND FUNCTIONAL RE-EDUCATION. A COMPARISON BETWEEN DRY AND WATER ACTIVITIES

LARION ALIN¹, BIANCALANA VINCENZO², OLTEAN ANTOANELA¹

Abstract

Osteoarthritis (OA) is a heterogeneous group of conditions that lead to joint symptoms and signs which are associated with defective integrity of articular cartilage, in addition to related changes in the underlying bone at the joint margins (American College of Rheumatology).

Objectives. The aim of the study was to compare the data obtained in functional assessments pre and post-rehabilitative intervention in patients with gonarthrosis who have conducted two different types of functional rehabilitation - dry and water activities - in order to check which of the two is more effective.

Method of research. For comparison, 32 patients (age between 49 and 76 years), suffering from gonarthrosis were recruited from the Orthopedic ward of the hospital of Urbino.

Patients underwent a functional re-education program consisting of 2 weekly sessions of 50-60 minutes each for 3 months (total 24 sessions). The re-educational program, identical in terms of purpose and progression, was carried out in aquatic environment by the GRS, and in the gym (dry) by the GRC.

All patients underwent a series of tests before (T0) and after (T1) the re-educational intervention in order to relate the pre-post-treatment variations in each groups and the intragroup changes to the post-test.

Results. The results show a significant greater reduction in arthrosic knee pain in subjects who underwent water treatment compared to those who performed conventional re-education (dry). The improvement of this variable is in line with the bibliography of this topic and with the scientific literature.

Conclusions. The results also show an improvement in the strength expression of the quadriceps in the group that performed functional re-education in water compared to the other group.

Key words: osteoarthritis, knee, water, gonarthrosis

Functional re-education in water, for some time now, is an intervention method indicated in many situations of functional recovery (Wang T.J., Belza B., Elaine Thompson F., 2017); (Benelli; Zanasso 2015).

Indeed, thanks to its specific characteristics, it allows to work with patient who have difficulty with muscle overload, reduced movement and joint capacity and in all those situations where there is a need for solicitations that can not be reached in a dry context. Today, the knowledge and rationalization of the therapeutic properties of water combine with advances in technology founded the bases of hydrokinesitherapy as an indispensable branch of Physical and Rehabilitative Medicine, with precise clinical indications and therapeutic programs to follow in the individual pathologies. The possibility of working in partial absence of gravity makes it possible to tackle rehabilitative exercises with a considerably reduced effort, obtaining excellent results in a short time.

The aim of the study was to compare the data obtained in functional assessments pre and post-rehabilitative intervention in patients with gonarthrosis who have conducted two different types of functional rehabilitation - dry and water

activities - in order to check which of the two is more effective (Kim E., Kim T., Kang H., 2010).

For comparison, 32 patients suffering from gonarthrosis were recruited from the Orthopedic ward of the hospital of Urbino. The recruitment standard considered the eligibility criteria indicated below:

Inclusion criteria: age between 49 and 76 years, female people diagnosed with medium-advanced gonarthrosis.

Exclusion criteria: other osteo-articular pathologies, psychological disorders and SNC disorders, dermatological pathologies and adversity towards the aquatic environment.

Patients were randomly divided into an experimental group (GRS) with 16 women, and in a control group (GRC), it also composed of 16 women.

Patients underwent a functional re-education program consisting of 2 weekly sessions of 50-60 minutes each for 3 months (total 24 sessions). The re-educational program, identical in terms of purpose and progression, was carried out in aquatic environment by the GRS, and in the gym (dry) by the GRC.

All patients underwent a series of tests before (T0)

¹Physical Education and Sport Faculty from Ovidius University of Constanta, Romania

²University of Urbino - Department of Biomolecular Sciences, School of Health and Sport Sciences, Italia
E-mail address for the corresponding author (olteantoanela@gmail.com)

and after (T1) the re-educational intervention in order to relate the pre-post-treatment variations in each groups and the intragroup changes to the post-test.

FUNCTIONAL RE-EDUCATION IN WATER
SPECIFIC OBJECTIVES PHASE I

In the first phase (12 sessions), it is very important for the patient to achieve a good degree of acclimatization in the water where not present. For this reason, to obtain good results, it is essential that the operator infuse safety, ensuring at least in the first part of the setting, his presence in the water.

Below are proposed exercises (Bartels E.M., Lund H, Hagen K.B, Dagfinrud H., et. al., 2009) hat aim to improve and restore the knee joint of which the objectives are:

1. Normalization
2. Mobilization
3. Proprioceptive recovery
4. Tone-trophism recovery

SPECIFIC OBJECTIVES PHASE II

In the second phase (12 sessions), there are exercises that aim to further improve muscle trophic tone and that provide the alternation of works already proposed in the previous phase to new dynamic stimulations aimed at:

1. Further improvement of the trophic tone of the arthrosic limb;
2. Recovery of articular R.O.M (Range Of Motion) necessary for normal daily activities;

3. Recovery of the correct deambulation.

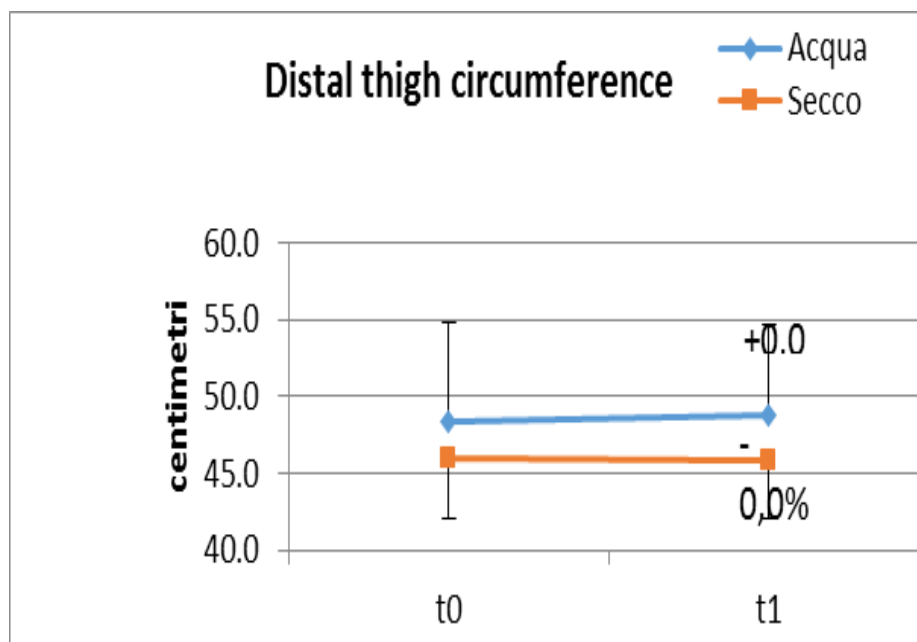
STATISTIC ANALYSIS

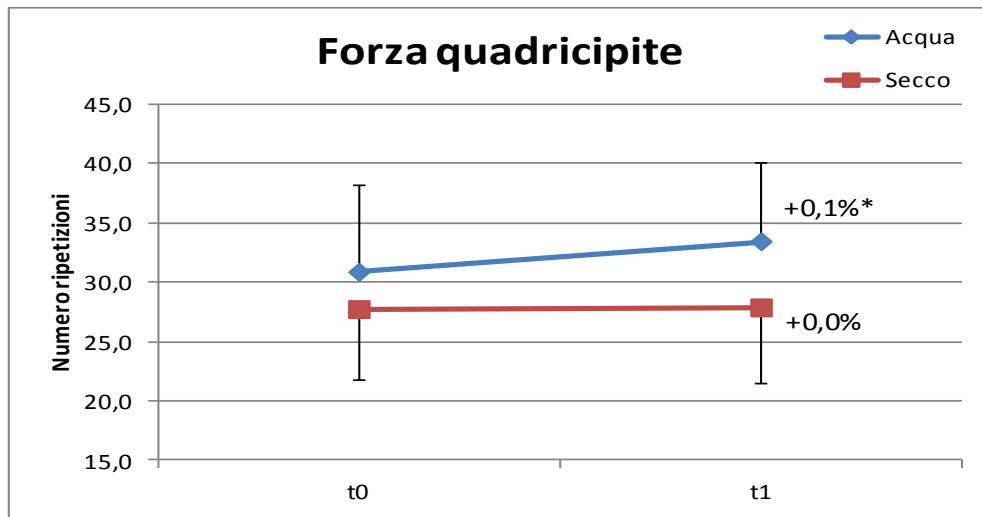
Except the SF-36 test (Questionnaire on the evaluation of the quality of life), the results of the functional assessments were analyzed, for each variable, with a 2-way covariance analysis (ANCOVA) (group and time) for repeated measurements (pre- and post-intervention). The analysis was carried out using as a predictive covariate the result of the evaluations given at T0. The post-hoc comparisons, to verify the pre-post-intervention differences in the individual groups and to assess the differences between the groups at the post-test, were carried out with the Bonferroni test. (Hochberg, Y. (1988).

The ordinal values obtained by the administration of SF-36 were compared using the nonparametric homologue of the t test for non-paired data (Mann-Whitney test) (Corder, G.W., Foreman, D.I., (2014). These results, reported for each dimension of the test (total 8), were shown in graphic form, reporting the 8 dimensions in the abscissa, and in y axis the variation (in percentage) between the final assessment and the initial one.

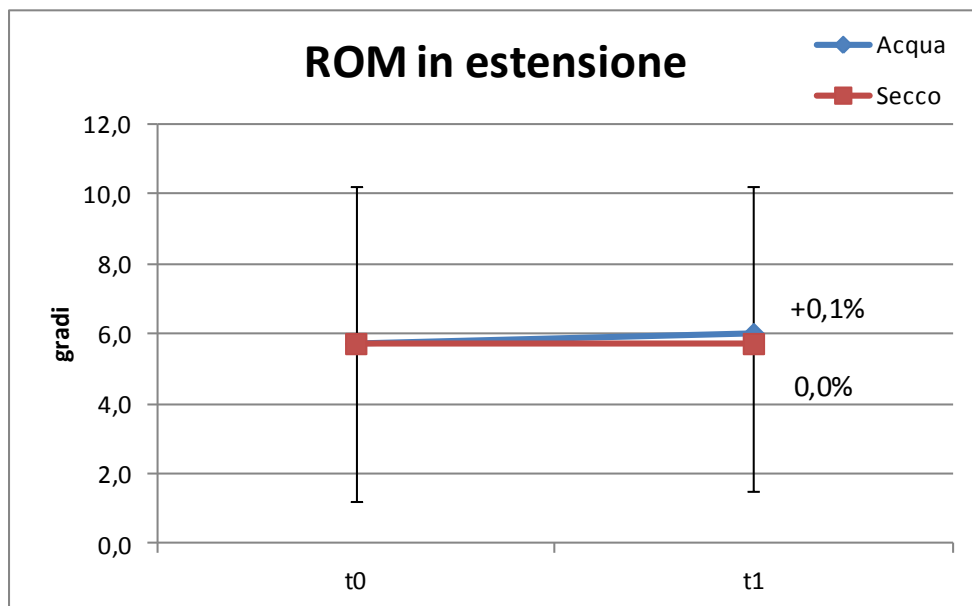
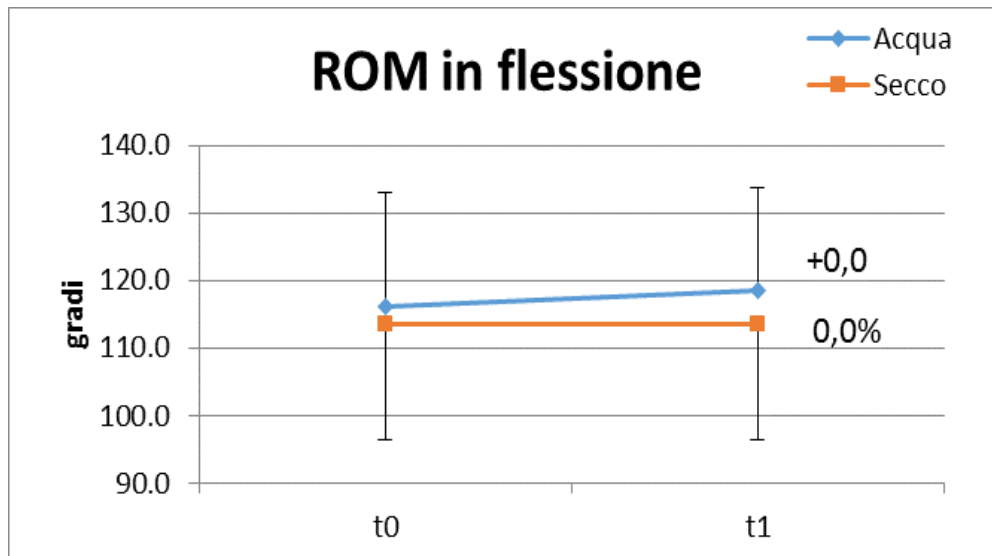
The significance level was set at $p < 0.05$.

Below are some graphs that compare some results obtained with the dry treatment and water treatment.





Knee articulation



This study aimed to compare the effects of two re-education treatments performed under different conditions (in water and dry) in subjects with Gonarthrosis.

The results show a significant greater reduction in arthrosic knee pain in subjects who underwent water treatment compared to those who performed conventional re-education (dry). The improvement

of this variable is in line with the bibliography of this topic and with the scientific literature. (Altman R.D., 2010).

The results also show an improvement in the strength expression of the quadriceps in the group that performed functional re-education in water compared to the other group.

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