Restoration of functionality of the Elderly with Gonartrose and Coxoartrose, by Hidrocinesioterapia: A retrospective study

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SUMMARY

The osteoarthritis (AO) is a degenerative process that affects the joints, especially in weight-bearing joints. With the increase in population increases longevity of chronic diseases interfering with well-being. One of the ways to treat this dysfunction is through hidrocinesioterapia, which can offer the elderly, their
quality of life through the aquatic physiotherapy. The aim of this study was to conduct a literature review on the applicability of the hidrocinesioterapia and its effects on the functionality and quality of life of the elderly with gonartrose and coxoartrose. The visits were carried out four top-level institutions libraries of the State of Pará: ESAMAZ, UEPA, UFPA, UNAMA, as well as used four electronic databases: PUBMED, LILACS, SciELO, MEDLINE. We used descriptors: arthrosis, hidrocinesioterapia, coxoartrose, gonartrose, functionality of the elderly, together and apart. Selected national and international journals published in Portuguese and English. Inclusion criteria were the publication of articles and references in the period of 1998 to 2012. OA occupies the third place in the list of insured persons away from the work they receive sickness. And according to the obtained results, it is concluded that the performance through the applicability of physiotherapy of hidrocinesioterapia technique is extremely important and beneficial in the functionality of the elderly. Providing less pain, less pain instabilities, improvement in muscle strength, improve flexibility and improves range of motion, making it so their daily life activities and improving their quality of life.

**Keywords:** Osteoarthritis. Hydrotherapy. Functional Recovery. Quality of life.

**INTRODUCTION**

The Osteoarthritis (OA) is the result of various patterns of joint dysfunction, being characterized by degeneration of articular cartilage and bone tissue proliferation and concurrent of connective tissue. Is the most common form of arthritis and is often associated with significant restriction and reduction in quality of life (QOL) (FALOPPA; ALBERTONI, 2008).

One of the clinical forms of OA, OA of hip and knee to be particularly more disabling, since these are the joints that receive the entire body weight. OA of hip reaches 20% of people over the age of 55 years and, despite being less common than OA of the knee, your symptoms is often more severe (RICCI; CHEN, 2006).

Its prevalence increases with age, of 7% among people of 65-70 years the 11.2% among those with 80 years or more, little ranging from existing studies. A recent study by the World Health Organization (who) States that the OA would be the fourth most important cause of dysfunction among women and the eighth among men. Radiographic studies show some changes in 30% of men and women over 65 years, but only a third of these are symptomatic (RICCI; CHEN, 2006; DOI et al., 2008).

As someone ages, there is a reduction of bodily functions. For example, reducing the capacity maximum respiratory and cardiac output. The muscle and bone mass decreases, while the amount of fat increases, mainly due to endocrine factors. This frailty of old age is characterized by decreased muscle strength, reflexes, decreased mobility and balance lentificados and reduced resistance. The result of this are falls,
fractures, reduced daily physical activity and loss of independence. The muscle weakness is not caused only by physiological processes of aging and wear due to use as in joint injuries, but also because of a lack of drive, leading to a vicious cycle (SILBERNAGL; LANG, 2006).

With the population growth, the degenerative diseases become more frequent, bringing with it the dysfunctions caused by the symptoms of OA (RICCI; CHEN, 2006; DOI et al., 2008).

Maintaining functional capacity is one of the requirements for healthy aging. The physical function is a universally accepted indicator of the State of health and an important component of the QOL. Individual's point of view, the physical function is needed to maintain the individual and independent participant in the community. Thus, dysfunction is a social problem, which brings greater risk of institutionalization and high costs for health services (TAMEGUSH et al., 2008).

One of the ways to treat is through hidrocinesioterapia, which is able to cover the needs of rehabilitation treatment, in addition to offering the elderly QV through aquatic physiotherapy (FACCI, MARQUETTI, rabbit, 2007).

The hidrocinesioterapia can be considered as one of the major therapeutic interventions in the treatment of OA, however there are few jobs that check your benefits. The physical and physiological properties of water allow the exercise hardly run on soil, which associated with the greater range of motion (ADM) and high temperature of the water increases joint mobility, muscle control and strength, relieving pain and accelerating the process of functional recovery. At the same time, the therapeutic program run on water is a safer form of muscle strengthening, as it does not increase the joint friction, as is the case of the exercises performed in solo (FACCI, MARQUETTI, rabbit, 2007).

On the foregoing, the present research aimed to evaluate the functionality of the elderly with gonartrose and coxoartrose, through the practice of hidrocinesioterapia.

**METHODOLOGY**

The present research refers to a retrospective analysis carried out through a review of the literature in the period of 1998 to 2012, on the theme "older persons with gonartrose and coxoartrose and the recovery of the body through the hidrocinesioterapia functionality. The visits were carried out four top-level institutions libraries of the State of Pará: ESAMAZ, UEPA, UFPA, UNAMA, as well as used four electronic databases: PUBMED, LILACS, SciELO, MEDLINE. It was used for the search more refined descriptors: arthrosis, hidrocinesioterapia, coxoartrose, gonartrose, old functionality, described together and apart. Selected periodicals published in national and international magazines in Portuguese and English languages. The inclusion criteria were articles published within the period investigated and which
complied with the theme and criteria of the search object. Were deleted articles that do not meet predetermined requirements.

79 search-related articles were selected and analyzed, of which 34 were chosen to guide the research, including only those who have greater relevance.

This search method allowed to find different articles and m, ais regarding specific research with respect to the object of study determined.

RESULTS AND DISCUSSION

CONCEPT:

**Osteoarthritis:**

Synonyms

- Arthrosis;
- Degenerative joint disease;
- Osteoarthritis;
- Osteoarthritis.

OA or degenerative joint disease (DJD) is characterized by progressive deterioration and breakage of the articular cartilage, especially in weight bearing joints; This leads to thickening subchondral bone, and bone excresences, bone Spurs (Spurs), around the shores of the joints. The cause is unknown, but most probably related to metabolic and biochemical changes (MITCHELL et al., 2006).

OA is a degenerative process that affects the joints. The changes begin in articular cartilage, which undergoes a process of softening and decay, even disappear in advanced stages. The subchondral bone also undergoes changes that translate into an increase of density or sclerosis and on occasional formation of cysts or cavities. On the banks, joint appear bony extensions of the subchondral bone, irregular shapes and sizes variables called osteophytes, which constitute the most signal characteristic of OA (SACHETTI et al., 2010).

OA is a chronic degenerative disease characterized by pain and the gradual loss of articular cartilage. OA presents multifactorial origin and may present in several joints where biochemical changes occur, metabolic and morphological, its features include loss of the normal configuration of the affected segment, crepitation, bony deformities, formation of osteophytes, presence of inflammatory processes and synovial fluid accumulation (SILVA et al., 2011).
**Epidemiology**

In relation to epidemiological aspects it is believed that about 85% of the world's population presents radiographic evidence of OA by the age of 65 years of age. OA is distributed equally among men and women in all ages are analysed, however when we analyze age groups above 55 years women are most affected and seem to develop a more serious illness, probably associated with bodily habits or even genetic predisposition. OA can vary also in relation to the ethnic group, however this variation may be more related to occupational differences and even between different cultural races. Genetic predisposition involves mainly the nodal of OA presentations from hands and a few of OA (FREITAS; PY, 2011).

**Etiology**

For oak and Papaléo (2006) OA is not defined, and can be classified in several ways:

- Primary (idiopathic): there is a cartilage degeneration in apparently normal articulation without obvious cause.
- Secondary form: the cartilage degeneration is a result of preexisting joint changes.

Several factors may be involved in the etiology of OA, such as age, genetic predisposition, trauma, repetitive stress, some occupations, obesity, changes in the morphology of the joint, joint instability and changes in the biochemistry of the articular cartilage (oak; PAPALÉO, 2006).

According to Paradiso (1998) the OA may have mechanical influences and hereditary and can occur secondarily to another joint disease, such as traumatic damage or sport. OA commonly affects the hip and knees, are the most widely occurring forms of joint disease.

**Pathophysiology**

In articular cartilage changes in chondrocytes and cartilage matrix results in the loss of normal structure. With the progression of the disease, some parts of the articular surface become more irregular and FIB extends into the deeper layers of cartilage, the intermediate zone and then reaching the subchondral bone. When the cracks are advancing more deeply, the shallow ends of fibrilada cartilage wear out, decreasing the thickness of cartilage and loose fragments in releasing joint space. At the same time, the enzymatic degradation of the array may further decrease the volume of cartilage. In later stages, the subchondral bone may become exposed (Figure 1) (REBELATTO; MORELLI, 2007).
Figure 1: Pathophysiology of osteoarthritis

As a result of the pathological process characteristic of OA, the cartilage degradation, accompanied by bone alterations represented by eburnificação or sclerosis of subchondral bone and articular remodeling with the participation, often of synovial inflammatory reaction (REBELATTO; MORELLI, 2007).

Classification
The classification proposed by Kellgren-Lawrence (1979), has been the most widely used in the literature to date, although new technologies of diagnostic imaging such as x-rays microfocal, magnetic resonance imaging (MRI) and ultrasound, are more precise (joint NATALIO; OLIVEIRA; MACHADO, 2010).

The criteria set by Kellgren-Lawrence go from I to IV and are classified as:

- Grade I: likely decreased joint space, with possible osteófitose;
- Grade II: osteophytes well defined and possible decreased joint space;
- Grade III: multiple osteophytes, clara decreased joint space and possible extremity bone deformities;
- Grade IV: large osteophytes, intense decreased joint space, severe sclerosis and bone deformities with defined edges (VALENCIA; DAYS; DAYS, 2006).

**Signs and symptoms**

Clinically the OA is manifested by pain ranging from mild to very intense, which worsens with the movements and to lift weight, joint stiffness that worsens at home, limitation of movements and Crackle (2008).

For Merklee (2007) the signs and symptoms of the increase with poor posture, obesity and occupational stress and may include:

- Deep joint pain caused by deterioration of cartilage, inflammation and bone stress, in particular after exercises or sustain weight, is the most common symptom, most often, is relieved by rest.
- Stiffness in the morning and after practice of exercises (relieved by rest), its causes are given by the degeneration of the cartilage, inflammation and bone stress.
- Crepitus or "shave" the cartilage during the move due to cartilage damage.
- Heberden nodes (distal interphalangeal joint bony enlargements), caused by repeated inflammation (Figure 2).
Gait change because of contractures of muscles that support the knee joint.
Decreased due to the ADM pain and joint stiffness.
Enlargement of the joint, induced by stress on the bone and disordered bone growth.

HYDROTHERAPY

Hydrotherapy is all external application of water, in any of its physical States, with therapeutic purpose (DEGANI, 1998).

Hydrotherapy is a feature used in the rehabilitation of patients with OA that have articular and extra-articular manifestations due to physical properties and physiological effects of water (FERREIRA et al., 2008).

With this physical therapy makes use of this resource by getting a group of possibilities of clinical interventions through the exercise in heated pools, as auxiliary resource rehabilitation or prevention of functional changes. The physical properties and water warming play an important role in improving, maintaining the ADM of the joints, reduced muscle tension and relaxation (CANDELORO; CAROMANO, 2007).
Being one of the oldest resources of physiotherapy, hydrotherapy is set to the external use of water with therapeutic purposes. It is a feature used in the rehabilitation process especially in patients with OA, by having some advantages due to physical properties and physiological effects, provided by the aquatic environment (RUOTI; MORRIS; COLE, 2000).

Hydrotherapy is often recommended for patients with OA, as it provides a range of benefits including reduction of edema, pain and overload on your joints already injured (FOLEY ET al., 2003).

Hydrotherapy promotes different reactions from those experienced in soil, improving the peripheral circulation, benefiting the venous return, in addition to providing a relaxing massage effect, acting this way in the main complaints of patients with OA. The exercises in the water are very well tolerated, especially in warm water, because the warm environment helps to reduce the pain and muscle spasms (REILLY; BIRD, 2001).

The water provides resistance for smooth movements and also the opportunity of training in various speeds. These components are the aquatic exercise is an excellent method for increased resistance and muscular strength (CAMPION, 2000).

**Properties of water**

The understanding of physical principles and the Thermodynamics of water provides his rational use (BIAZUS; P; LOUREIRO, 2010).

Floating allows the patient to walk with little overhead to articulate due to reducing the effects of gravity and the consequent increase of the articular (KISNER ADM; COLBY, 2005).

Hydrostatic pressure exerts a positive effect during the immersion (the same pressure is exerted in all directions of the body and increases with depth), reduction of edema, because the system redistributes the venous blood from the extremities to the thorax (KISNER; COLBY, 2005).

Water resistance can be used passively and actively, passive movements through the water facilitates relaxation and stretching of soft tissues, actively water resistance increases the energy expenditure required to move the ends, promoting muscle strengthening (BUENO et al., 2007).

The thermodynamics must also be taken into account and is related to the ability of the submerged body exchange energy (heat) with water by means of conduction and convection, having positive effects on soft tissues that can be easily deployed, increasing the degree of movement and reducing joint pain (SACCHELLI; ACCACIO; RADL, 2007).
The benefits provided by the water are: muscle relaxation, increase blood flow and flexibility, muscle strengthening, gait re-education, improves balance and coordination and, finally, is a playful activity and recreation (BUENO et al., 2007).

**Physiological effects**

The physiological effects of hydrotherapy arising from a combination of the physical effects of water (thermal and mechanical) and effects of exercise. The effects vary with the duration of treatment, exercise, type, progression, exercise intensity, water temperature, posture, associated movements of the upper limbs and the patient's pathology (IDE et al., 2004).

With the effects of immersion in warm water are also the elevation of body temperature even in the home, as long as the water temperature is higher than the skin, approximately 35.5° C. The increase in body temperature also occurs by conversion of energy during exercise. Depends on the intensity of the exercise and the amount of body fat (RUOTI; MORRIS; COLE, 2000).

**Hidrocinesioterapia**

The hidrocinesioterapia incorporated recent advances the knowledge of physical and functional assessment, evidence-based practice, clinical experience the principles of hydrostatics, hydrodynamics and Physiology, to trace and support patients' treatment plans in therapeutic pool (GOMES, DAYS, CISNEROS, 2007).

The aquatic exercises have been widely used in physical therapy programs, especially when the solo exercises generate pain. The decrease in joint impact during physical activity induced by flotation, reducing sensitivity to pain, decrease in compression joints Achy, greater freedom of movement and reducing the painful spasm. The floating effect assists the movement of stiffened joints in larger amplitudes with a minimum of pain, allowing the realization of exercises on the ground could be considered very difficult (CANDELORO; CAROMANO, 2007), (HINMAN; HEYWOOD; ANTHONY, 2006), (SILVA et al, 2011).

The strengthening exercises with submerged patient are based on physical principles of hydrostatics, that allow you to generate resistance constant motion multidimensional. This resistance increases proportionally as the force is exerted against it, generating a minimal overhead in the joints (CANDELORO; CAROMANO, 2007).

A comprehensive program of hidrocinesioterapia meets the needs of physical conditioning and rehabilitation of the patient, taking into account the psychological and sociological
components of QOL. Within this context, the promotion and the health care of the elderly include preventive, restorative and reabilitativas, giving priority to preserve, maintain, restore or develop the function for patients with coxoartrose and gonartrose (KOURY, 2000).

**Indications**

According to Koury (2000) hydrotherapy is indicated when you want little or no weight-bearing, or when there is acute inflammatory process, pain, retraction and muscle spasm and limitation of ADM, which can in no way individually or jointly reduce the normal function. Hydrotherapy is also an option for patients who are unable to perform exercises on the ground due to recent surgery, injury or acute disease, neuromuscular and orthopedic or neurological disabilities rheumatological.

The hidrocinesioterapia in patients with OA aims to maintain joint mobility, muscle lengthening and increase ADM, improving joint stability. In addition, aims to optimize the joint biomechanics to maintain the correct alignment of the affected segment and reduce any excess of abnormal load on the joint involved. The relief of pain, stiffness and other symptoms associated with is also part of the goals of physical rehabilitation (IZOLA; BIASOLI, 2003).

**Contraindications**

Second Kisner and Kolby (2005) are contraindications:

- Incipient heart failure and unstable angina.
- Respiratory dysfunction, vital capacity below 1 liter.
- Severe peripheral vascular disease.
- Risk of bleeding or hemorrhage.
- Severe renal disease: patients will be unable to adjust the loss of liquid during immersion.
- Open wounds, colostomy and skin infections.
- Urinary and fecal incontinence.
- Infections or diseases transmitted by water and by air: examples include gastrointestinal infections, influenza, typhus, cholera and polio.
- Uncontrolled seizures: they create a security problem, both for the professional and the patient, if necessary the immediate removal of the pool.

The same authors report that the specific purpose of aquatic exercise is to facilitate functional recovery by providing an environment that increases the ability of the patient and/or professional to perform various physiotherapeutic interventions, which aim to:

- Facilitate WMD exercises;
- Start the resistance training;
- Facilitate unloading activities of weight;
• Promote the application of manual techniques;
• Promote the three-dimensional access to the patient;
• Facilitate the cardiovascular exercises;
• Start the simulation of functional activities;
• Minimize injury and reduce the risk of injury relapsing during rehabilitation;
• Promote relaxation of the patient.

FINAL CONSIDERATIONS

According to the articles analyzed in this research, it is possible to observe that the acting through the technique of hidrocinesioterapia physiotherapy is of extreme importance and in recovery and/or functionality and QOL of the aged with gonartrose and coxoartrose. Being today one of the most prominent therapeutic techniques for the treatment of symptoms of these diseases.

In this way, with this study to review the expected contribution to the literature and to society in General by encouraging researchers and professionals operating in the area, to seek scientific evidence on the subject of improving its applicability to be better developed next to their patients.

Thus, at the end of this study, it can be concluded that the applicability of the hidrocinesioterapia is beneficial and very effective in the treatment of elderly patients with gonartrose and coxoartrose, provided that your technique is applied correctly and/or with the aid of other techniques and treatment methods. Its effects provide significant improvements in the functionality of the old guy thus, greater QOL. However we hope this therapeutic method gives the elderly a condition where he can feel more secure and confident having independence and autonomy in gave day-by-day for performing their activities of daily living (ADL's).

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