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# Therapeutic Features of Medical Care of Knee Osteoarthritis: A Study of 60 Cases

**Dhahri Rim[1], Metoui Leila[1], Gharsallah Imène[1], Boussetta Najah[1], Laajili Feida[1], Louzir Bassem[1], Othmeni Salah[1], Ksibi Imène[2], Maaoui Rim[2] and Rahali Hager[2]**

[1]*Internal medicine department of The Principle Military Hospital of Tunis, Tunisia*

[2]*Physical and Rehabilitation Medicine department of the Principal Military Hospital of Tunis, Tunisia*

[*]**Corresponding author:** Rim D, Internal medicine department of The Principle Military Hospital of Tunis, Tunisia, E-mail: rimdhahri@ymail.com

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## Abstract

Osteoarthritis (OA) is the most common form of arthritis. It gradually worsens with time. Osteoarthritis treatments can slow the progression of the disease, relieve pain and improve joint function. The present work aimed to study the clinical and therapeutic features of medical care of knee osteoarthritis.

**Methods:** Retrospective longitudinal study done on the department of Physical and Rehabilitation Medicine of the Principal Military Hospital of Tunis between January 2011 and December 2012, about 60 patients with knee OA. These patients were divided into two groups of 30 patients each: patients aged 65 years and over or old subjects (OS) and young subjects 30 to 55 years (YS). The evaluation protocol included clinical algofunctional before and after medical and rehabilitative treatment performed on an outpatient program with three sessions per week for two months.

**Results:** There were 35 women and 25 men with a mean age of 58 ± 6.27 years. The average duration of knee OA was 63.74 ± 38.62 months. The main characteristics of elderly subjects compared to young subjects, before rehabilitation, were the bilateral involvement of the knees (p=0.02), severity of pain (p=0.02), disability (p=0.006), stiffness (p=0.02), muscle weakness of the quadriceps (p=0.006), hamstrings (p=0.03), the retraction of the latter (p=0.04) and reducing the walking distance (p=0.04). 38 patients (19 OS and 19 YS) adhered to the rehabilitation program. After rehabilitation, the main features were the reduction of pain by 60%, improving activities of daily life of 50% .The rehabilitative treatment was more effective in the elderly in terms of pain (p=0.03) and activities of daily living improvement (p=0.01).

**Conclusion:** Non-pharmacological treatment of knee osteoarthritis is an essential practice at all stages and at any age. It allows elderly to improve their functional ability.

**Keywords:** Knee; Osteoarthritis; Therapeutic; Rehabilitation

## Background

Knee osteoarthritis is a common disease in the elderly, however its prevalence is increasing among young adults. Its medical care codified and is the subject of several guidelines like the recommendations of the European league antirheumatic (EULAR) in 2003 for the treatment of knee osteoarthritis [1].

Few Tunisian studies have focused on profiling knee OA according to age and evaluating its therapeutic management.

We then set targets of this work to describe clinical, radiological and therapeutic knee osteoarthritis features by age. It was also proposed to evaluate the non-pharmacological rehabilitation treatment overall load in the medical treatment of Knee osteoarthritis e.g. KOA. And that in light of the recommendations of the EULAR 2003 [1].

## Methods

A cross sectional study was conducted between (January 2011-December 2012) in the department of Physical Medicine and Functional Rehabilitation of the Main Military Hospital of Tunis.

Patients with knee osteoarthritis diagnosed with Knee OA according to the Using history, physical examination and radiographic findings: pain of a knee with at least one criterion of the following: Over 50 years of age, Stiffnesss<30 minutes, crepitus and osteophytes on knee radiographs. Age criterion was excluded for patients under 50 years old.

Patients were divided into two groups, one was made up of elderly of sixty five years or more, the other of young adults YS, whose age was between thirty and fifty five. All patients had a rehabilitative treatment based on masso-physiotherapy, physiotherapy, occupational therapy, proprioceptive rehabilitation and an education program for learning self-rehabilitation. The rehabilitation program was performed on an outpatient basis at a rate of three sessions per week for two months. All patients were jointly under pharmacological treatment.

Our assessment protocol was based on clinical and functional evaluation. Pain was evaluated by the following scales: Visual analogue

scale e.g. VAS pain, the WOMAC questionnaire for the lower limbs (pain) section, the LEQUESNE algo-functional index for knee pain (pain section). The evaluation of the functional impact of knee osteoarthritis was made through the VAS Handicap, the WOMAC index (stiffness section and function) and LEQUESNE algofunctional index (walking distance, and activities of daily living) before and after rehabilitative treatment. The rehabilitation program was given on an outpatient basis at a rate of three sessions per week for 2 months.

The rehabilitative protocol included:

- analgesic and relaxant massage therapy at both knees
- An analgesic therapy
- Active mobilization helped by passive mobilization
- Intermittent static muscle building knees
- A stretch of plans in pelvic anterior and posterior
- A proprioceptive rehabilitation
- Occupational therapy
- Learning a self-rehabilitation program

Statistical Analysis:

Data were entered using Excel software and analyzed using SPSS version 11.5 software.

### Descriptive study

We calculated simple frequencies and relative frequencies (percentages) for categorical variables. We calculated averages, medians and standard deviations and determined extreme values for quantitative variables.

### Analytical study

- Comparison of means: Comparisons of mean 2 of independent series were performed using the Student t test for series independent.
- Comparisons of multiple (>2) medium: in series independent were performed using the test F Snedecor analysis of the parametric variance (one-way ANOVA).
- If a significant difference, the comparisons 2-2 were made by the Bonferroni method.
- Percentages Comparisons: Comparisons of percentages on independent series were performed by the chi-square Pearson and in case of non-validity of the test, the Fisher exact test bilateral.

## Results

Sixty patients were recruited for the study. They were divided in two groups by age: 30 older subjects (OS) aged over 65 years and 30 young subjects (YS) aged between 30 and 55 years. The average age of patients was 58 ± 6.27 years, ranging from 31 to 90 years. In the group of OS the average age was 70 ± 5.8 years, while that of the YS group was 46 ± 6.75 years. Patients included in the study included 35 women and 25 men. The overall Sex Ratio was 0.71, those of OS and YS groups were respectively 0.66 and 0.76. This preferential involvement of women was associated with more frequent and earlier involvement beyond 50 years. The average disease duration was 63.74 ± 38.62 months with a range of 2-288 months. This average was 73.74 ± 88.62 for OS and 40.55 ± 29.04 for YS.

Twenty-eight of the 35 women in our study were housewives. 73.3% of patients had at least one medical history, high blood pressure was noted in 20 cases, followed by type 2 diabetes and osteoporosis in respectively 12 and 9 cases.

Thirty-six patients were followed for another documented location of osteoarthritis: 21digital osteoarthritis with significant association with age (p=0.05), 10 lumbar arthritis, 5 for cervical arthritis. By adopting the definitions Kellgren, Dougados and ACR for poly-osteoarthritis [2], 28 patients met the three sets of criteria, 18 met the ACR criteria [3], 21 met the criteria Kellgren and 51 had poly-osteoarthritis according to Dougados criteria.

In all cases, patients were overweight or obese with a mean BMI at 32.26 ± 5.4 kg/m$^2$. Morbid obesity was objectified in 11 cases. The average waist circumference was at 113 cm, it was in all cases greater than the thresholds defining android obesity. Combining the criteria of IDF 2005 [4], 12 of our patients had metabolic syndrome.

Seniority, triggering mechanisms (positions, standing, sitting and squatting), bilateral involvement (90%) were the elements that characterized the OS patients. Membership in rehabilitative treatment was seen in as many OS as young adults (38 cases or 63.33%, of which 19 YS) (Figure 1).

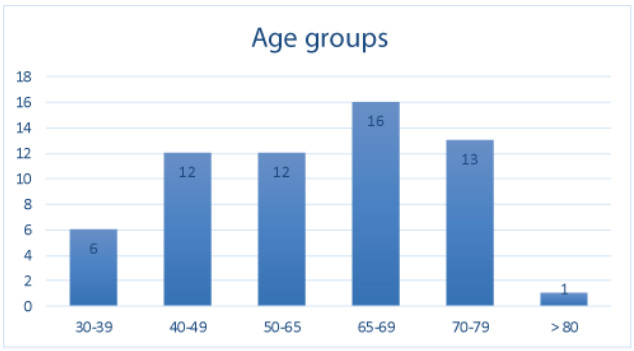


**Figure1:** Age group's representation in our study population

The joint review objectified knee mal-alignment in 33 cases with a predominance of genu varum observed in 21 cases. Joint mobility showed a limitation of passive range of motion in 43 cases and 27 cases in active mobilization.

At the initial assessment, quadriceps muscle atrophy was observed in 40 cases, that of the vastus were noted in 30 cases. Muscle weakness on the quadriceps was rated significantly greater in elderly (p=0.006).

The initial assessment of pain intensity showed a mean of VAS-pain at 63.11 ± 14.22 mm, which was significantly related to age (p=0.002) and sex (0003). This reflects the difficult experience of pain in older subjects and a lower tolerance for pain in women.

The evaluation of the impact of knee joint on function has objectified a 60.56% handicap with a significant association with age (p=0.006), the walking was more limited in OS. The functional disability related to knee osteoarthritis was estimated by a LEQUESNE index of overall average of 12.35 with a significant relation to age (p=0.04). Stiffness emerged as a major functional limitation factor among older subjetcs (4.76 ± 2.13 p=0.02). The mean VAS before treatment was 63.11 ± 14.22 mm. The WOMAC score (pain section) was 16.22 ± 2.01. The index of LEQUESNE (pain) was 4.44 ± 1.02.

At the end of the rehabilitation program, indices' evaluation (Figure 2) has shown that there has been a reduction in pain intensity of -38.27 mm or 60% of its initial value, regardless of age.

The analysis of evaluated data showed that all patients improved on functional disability plan, and impotence with an average decrease of VAS Handicapof-31.02 mm representing 51% of its initial value and an average decrease in the global WOMAC index of -38.19 (59% of its initial value) and a decrease in the algofunctional Lequesne Index of -4.45 (36% of its initial value) (Figure 2).

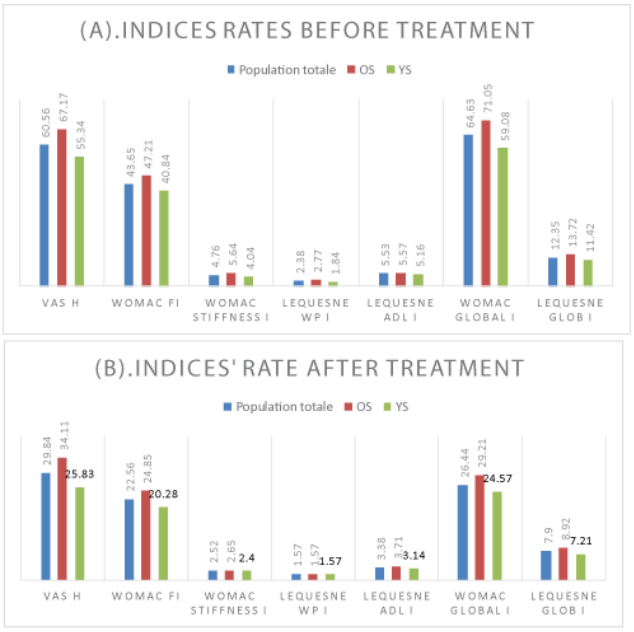


**Figure 2:** representing indexes rates before, A) and after, B) treatment: VAS H: Visual Analagic scale Handicap; WOMAC FI: WOMAC functional impairement; Lequesne WP I: LEQUESNE Walking Perimeter Index; LEQUESNE ADL I: LEQUESNE Activities of daily life Index; WOMAC Global U: WOMAC Global Index; LEQUESNE Global I: LEQUESNE Global Index.

After functional treatment, there's been an improvement in range of motion of at least 5% regardless of age.

The evaluation of muscle balance sheet showed no significant difference with age except for muscle testing. Indeed, the OS had muscle weakness of the quadriceps significantly greater than in younger (p=0.01). After the treatment, recovery of muscle strength was better in YS especially for the quadriceps (p=0.01).

By profiling these results by age group, we found a decrease in the intensity of pain in all OS (19 cases), 13 of them lowered their VAS pain at a lower level than 50 mm. Among young adults, the pain remained stationary in 2 cases and was exacerbated in one case.

The evaluation of the joint objective balance improved joint range of at least 5%.

Similarly, evaluation of muscle balance showed improvement in trophicity, scalability and muscle strength in both groups. Patients have gained on Quadriceps trophicity 1 cm on average.

It is also important to note the improvement in functional terms (global WOMAC index) of about 60% in OS as well as in young adults.

## Discussion

In the end, the overall assessment of the gain in functional capacity estimated by the global LEQUESNE index was 35% for OS and 36.8% for YS. Improved global WOMAC score was 58.8% for OS and 58.4% for YS.

Overall, there was a reduction in the consumption of NSAIDs and analgesics initially 28 cases in 3 cases at the end of the protocol.

With the aging of the Tunisian population, we shall have to face a lot of knee OA which requires us to adopt a strategy involving:

- Fighting overweight, obesity and trauma at a young age.
- Encouraging regular, moderate physical activity at any age.
- Spreading the advice of articular economy.
- Enhancing functional treatment.
- Respecting the unique characteristics of geriatric rehabilitation.
- Encouraging and motivating the elderly to join the self-home rehabilitation program.

These results were in line with data from the literature and confirmed the effectiveness of the functional and educational treatment in combination with taking conventional pharmacological management for knee OA. These findings were indeed valid regardless of age.

Elderly patients are often polymedicated. This situation made that non-pharmacological management becomes essential. This was remarkable in our study since our OS met the functional treatment, despite the pharmacological limitations of their age and their busy medical history. Our findings argued in favor of the effectiveness of treatment whatever the age group and this was consistent with the literature data and international recommendations [1].

The management of degenerative osteoarthritis meet the same principles as for young adults. The management should, however, take into account in addition to the requirements of precautions and rules recommended for the elderly [5].

In recent years, several studies have highlighted the importance of non-drug therapies in the treatment of osteoarthritis and have proven their effectiveness in reducing pain and improving function [6].

In our study, an algofunctional evaluation before and at the end of the rehabilitation program was made to all patients who have well-bonded to the functional treatment (19 YS and 19 OS). Functional rehabilitation of knee osteoarthritis is now a mandatory practice at all stages of the disease [7].

In healthy subjects, after thirties, there are a loss of muscle mass of 3 to 5% per decade, with a further decline at the age of 60 years. It there's perhaps a greater loss in terms of muscle strength, up to 30% per decade after the age of 70 years. A healthy quadriceps and coordinated the task prevents only joint depreciation, while reducing the risk of falls in the OS [7].

The analysis of different clinical indications of lower limb muscle testing showed that there's been an improvement in muscle strength in both groups compared with the initial examination.

This improvement in muscle strength is more important in younger patients in our series than in older subjects. However, this difference was significant only for the quadriceps (p=0.01).

Several studies have reported a link between knee arthritis and quadriceps weakness [8].

In our study, there was an overall atrophy of the quadriceps as well in OS than in YS. Muscle testing of the lower limb showed a significantly greater weakness in OS than in younger adults and that both the quadriceps than the hamstrings. This can be explained by aging and muscle wasting.

In the literature, these exercises give good results in 70% of cases at 15 to 20 sessions [9].

It is clear from our investigation that the practice of self-education through patient is rare (Of the 11 patients who had prior therapy for osteoarthritis none have practiced self-re-education at home).

The explanation might come from a lack of time or belief of treating physicians. This was supported by the study of Mazieres et al. [6] the authors explained that although most practitioners would agree with non-pharmacological EULAR recommendations [1], they did not apply because, among other things, lack of time (the other explanations cited were that the recommendations were too rigid and they do not take into account the views of patients). That is why we must inform patients about the interest and how to practice this self-rehabilitation

## Conclusion

It would be interesting to complete this work by a prospective study on a larger sample and over a longer period with a long-term monitoring to assess compliance and effectiveness of the program of self-rehabilitation.

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