

Osteoarthritis of the Hip

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Abstract: Osteoarthritis (OA), often referred to as “wear-and-tear” arthritis, or degenerative joint disease, is the most common form of joint disorder. The effects of OA on the large joints of the lower extremities, including the hips, can result in reduced mobility and marked physical impairment that can lead to loss of independence and to increased use of health care services such as dependency in walking, stair climbing, and rising from a seated position. Disease initiation and progression are caused by a combination of local factors and systemic factors that vary between individuals and its progression caused by a combination of endogenous and environmental risk factors. The management of hip OA included: 1. Pharmacological treatment: analgesic, NSAID, duloxetine, opioid, intra articular injection. 2. Rehabilitation management: joint rest, physical modalities, exercise, appropriate joint use, weight control, assistive devices and orthosis, ergonomic and environmental adaptation, education, psychological intervention. 3. Surgery. Medical rehabilitation goal such as: decrease pain/symptoms, increase range of motion, maintain the strength of muscle, increase aerobic capacity, optimize daily function and minimize disability. Exercise therapy should be the mainstay therapy when possible, with physical modalities utilized as an adjunct. Evaluate and correct for abnormal biomechanics, using assistive devices and orthosis as necessary.

1 INTRODUCTION

Osteoarthritis (OA), often referred to as “wear-and-tear” arthritis, or degenerative joint disease, is the most common form of joint disorder. As a degenerative disorder, OA can involve any joint, and it primarily affects the articular cartilage and surrounding tissues. The hip joint is one of the body’s largest weight-bearing joints and is commonly affected by OA. The OA process involves progressive loss of articular cartilage, subchondral cysts, osteophyte formation, periarticular ligamentous laxity, muscle weakness, and possible synovial inflammation (Lespasio et al., 2018). The effects of OA on the large joints of the lower extremities, including the hips, can result in reduced mobility and marked physical impairment that can lead to loss of independence and to increased use of health care services such as dependency in walking, stair climbing, and rising from a seated position (Lespasio et al., 2018).

2 DISCUSSION

The reported prevalence of hip osteoarthritis varies greatly due to differences in the definition of osteoarthritis used (radiographic, symptomatic, or self-reported) and the characteristics of the sample (Bennell, 2013). The prevalence rates varied from 0.9% to 45%. Men and women showed similar overall prevalence: 11.5% for men and 11.6% for women. In contrast to prevalence, information on the incidence of hip osteoarthritis is limited, reflecting greater methodological challenges. Cumulative incidence rates varying from 3.8% over 10 years to 33% over 8 years (Bennell, 2013). The lifetime risk for symptomatic hip OA is 19% for men and 29% for women (Suri et al., 2012).

2.1 Etiology and Risk Factors

Disease initiation and progression are caused by a combination of local factors and systemic factors that vary between individuals (figure 1 and 2) and its progression caused by a combination of endogenous

and environmental risk factors (Lohmander et al., 2017).

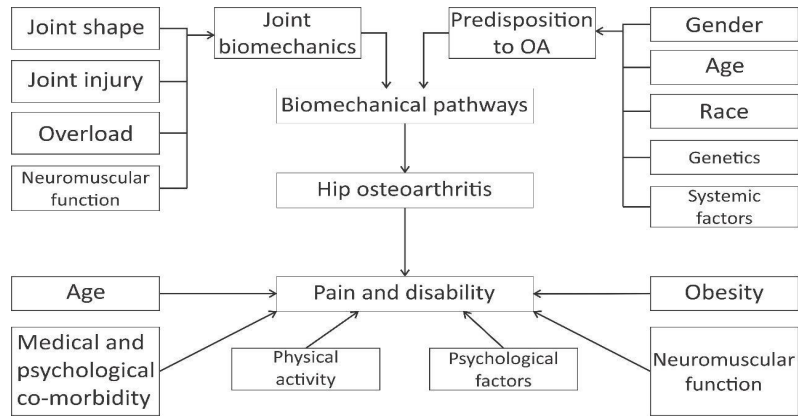


Figure 1: Etiology and risk factor for hip osteoarthritis.

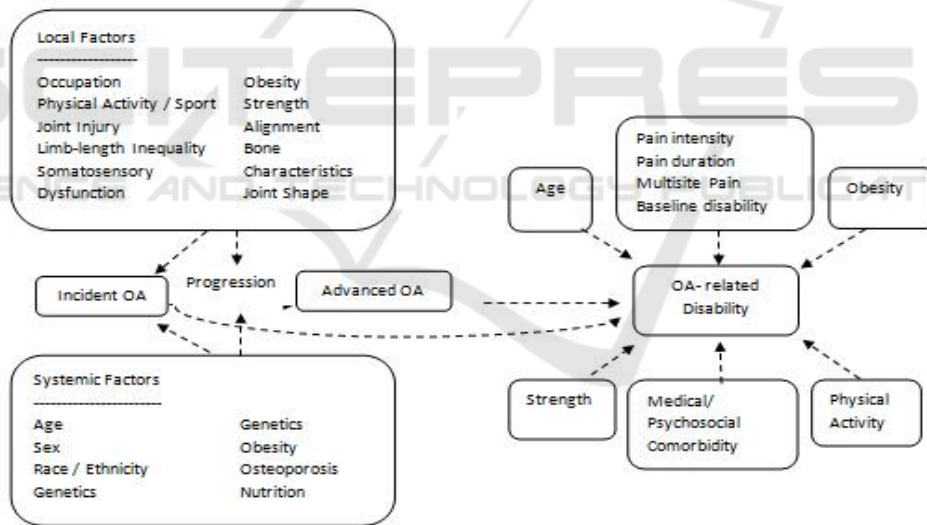


Figure 2: Risk factors for osteoarthritis and related disability.

2.2 Signs And Symptoms

- Pain:
 - Progressively increasing
 - Aggravated - movement; when hip is loaded wrong or too long; cold weather
 - Eased with continuous movement
 - Commonly in groin/thigh, radiating to buttocks or knee
 - End-stage: Constant pain, night pain
- Stiffness:
 - Morning stiffness with end-stage osteoarthritis, usually eased with movement (<1 hour)

- “Locking” of hip movement
- Decreased range of motion - leading to joint contractures and muscle atrophy
- Crepitation with movement
- Gait abnormalities - short limb gait, antalgic gait, trendelenburg gait
- Leg length discrepancy
- Local inflammation

2.3 Criteria OA of The Hip

Table 1: Clinical (history, physical examination, laboratory) classification criteria for osteoarthritis of the hip, classification tree format.

1	Hip pain
2a	And Hip internal rotation < 15°
2b	And ESR ≤ 45 mm/hour (If ESR not available, substitute hip flexion ≤ 115°)
3a	Or Hip internal rotation ≥ 15°
3b	And Pain on hip internal rotation
3c	And Morning stiffness of the hip ≤ 60 minutes
3d	And Ages > 50 years

Hip pain And At least 2 of the following 3 features ESR < 20 mm/hour Radiographic femoral or acetabular osteophytes Radiographic joint space narrowing (superior, axial, and/or medial)
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Figure 3: Combined Clinical (history, physical examination, laboratory) and radiographic classification criteria for osteoarthritis of the hip, traditional format.

2.4 Diagnosis

- History
- Physical examination
- X-ray
- CT scan
- MRI

2.5 Management and The Goal

- Pharmacological treatment:
 - Analgesic: paracetamol
 - NSAID
 - Duloxetine
 - Opioid: Tramadol
 - Intra articular injection: corticosteroid
- Rehabilitation management:
(Marks, 2015 ; Stemberger and Kerschan, 2013)

- Joint rest
- Physical modalities
- Exercise
- Appropriate joint use
- Weight control
- Assistive devices and orthosis
- Ergonomic and environmental adaptation
- Education
- Psychological intervention
- Surgery: Total Hip Replacement

Table 2: Combined clinical (history, physical examination, laboratory) and radiographic classification criteria for osteoarthritis of the hip, classification tree format.

1	Hip pain
2	And
	Femoral and/or acetabular osteophytes on radiograph
3a	Or
	ESR \leq 20 mm/hour
3b	And
	Axial joint space narrowing on radiograph

The goal of Medical Rehabilitation are to decrease pain/symptoms, Maintain and increase range of motion, Maintain the strength of muscle, Increase aerobic capacity, Optimize daily function, and Minimize disability (Talmage and Lemke, 2001; Hanada, 2003)

2.5.1 Joint Rest

In hip pain patients automatically tend to rest more, but it will be better to advise patients with this condition to get rest periods of 20 - 60 minutes duration. Such rest periods allow the cartilage to rehydrate. Although there is little scientific evidence that rest or joint unloading might be effective in preserving or improving the mobility and work capacity of persons with osteoarthritis, relief of pain is usually said to be proportional to the amount of protection from weight bearing (Marks, 2015).

Muscles around a painful joint are thought to fatigue more readily than muscles of a healthy pain free joint, and can work more effectively if they are not fatigued, protection from weight bearing appear to influence the work capacity of individuals with hip osteoarthritis. Rest can reduce or minimize joint inflammation and protect an inflamed osteoarthritic joint from further damage. Patients are advised to make appropriate planning of activities and avoidance of prolonged or repetitive activities (Marks, 2015).

2.5.2 Physical Modality

To relieve pain transiently and to aid muscle relaxation particularly during an acute flare of the

disease, and to treat associated inflammatory conditions ice therapy or transcutaneous electrical nerve stimulation can be considered. In mild sub-acute or chronic disease phases, such modalities: short wave diathermy and ultrasound applications, may help to facilitate joint mobilization and stretching procedures needed to maintain or increase hip joint range of motion (Marks, 2015).

2.5.3 Exercise

Exercise is designed to reduce or prevent muscle weakness and atrophy, maintain joint range of motion, and improve endurance. The implementation of exercises should not be stressful or injurious to the joints. Since joint stiffness, pain, disability and muscle weakness are related in patients with hip osteoarthritis a series of carefully graded non-weight bearing isometric strengthening exercises carried out on a daily basis to improve hip abductor and hip extensor muscle strength and endurance. Once muscle spasm and any evidence of joint inflammation have subsided, these exercises might be progressed to pain free isotonic exercises performed thrice weekly. Progressing too rapidly could worsen pain, likely discouraging patients to continue training. On the other hand, too light exercise may remain ineffective (Uusi et al., 2017).

Well designed non-weight bearing or partial weight bearing low-impact walking and conditioning exercises performed within the limits of pain and motion on a stationary bicycle, or in a warm pool (temperature 30°C -34°C) and swimming exercises in water, have all been shown to promote functioning in those with no signs of acute

inflammation. The re-education of postural control and balance is important to prevent fall (Marks, 2015), because falls, which can cause further traumatic hip joint damage, are so common in people with hip osteoarthritis.

Safety of an intervention is an important point. In general, exercise is safe and well tolerated by most patients with lower limb OA. However, the patient has to be informed that disease activity can vary from day-to-day, and that signs of excessive exercise stress include joint pain during activity, pain lasting more than 1–2 hour after exercise, swelling, fatigue, and weakness (Stemberger et al., 2013).

2.5.4 Appropriate Joint Use

Patients should be advised to avoid prolonged static activities, contact sports, repetitive high impact loading or over-exercising. Patients also should try to carry out activities as ease and comfortable as possible, and avoid rapid walking or needless stair climbing. Hip joint stresses may also be lessened by limiting the weight of loads carried (Marks, 2015).

2.5.5 Weight Control

The maintenance of an optimal body weight or the implementation of a weight reduction program for overweight or obese patients may reduce unwarranted stresses on an osteoarthritic hip joint. Another potential problem related to obesity that could destroy articular cartilage, or cause greater axial loading than the hip joint can accommodate (Marks, 2015).

2.5.6 Assistive Device and Orthosis

It has been widely reported that people with hip osteoarthritis who have unsteady gait or advanced disease, may improve their functional capacity and acquire some protection from untoward mechanical perturbations of the affected joint through the use of crutches, canes, walkers, or braces. It is further believed that footwear designed to absorb shock, shoes that give good support, shoes that have thin non-slip soles, or the use of corrective foot orthotics such as a heel lift in one shoe—if leg lengths are unequal—may prove beneficial, while dress aids, such as a long shoe horn or stocking stretcher, may help to facilitate those daily activities that require bending and reaching (Marks, 2015).

2.5.7 Ergonomic and Environmental Adaptations

Adaptations to the home environment may further relieve some unwarranted hip joint stresses that could otherwise hasten hip joint damage. Joint protection during functional activities may also be enhanced by the use of raised toilet seats, grab bars next to toilets and in tubs or shower facilities and using adapted aid to do the activity of daily living (Talmage and Lemke., 2001). Arm rests on chairs and higher chairs may also prove beneficial for people with end stage hip osteoarthritis who are not candidates for surgery (Marks, 2015).

2.5.8 Education

For people with hip osteoarthritis, education about their condition, and their role in its management, is a vital first step towards lessening their level of functional disability and decreasing their pain. They may experience an overall improvement in life quality when compared to those receiving no form of education (Marks, 2015).

2.5.9 Psychological Intervention

Hip osteoarthritis can become a chronic pain and make the patients get depression condition and need psychological support to face the pain.^{11,12} One study found that patients whose spouses were involved in their program had less pain and psychological disability compared with patients whose spouses did not participate (Talmage and Lemke., 2001).

2.5.10 Evidence Based and Recommendation

Most frequently recommended for exercise is aquatic exercise and biking because provide cardiovascular training without putting undue stress on the joint of lower extremity, so to prevent the inflammation and increasing the pain (Talmage and Lemke, 2001). The benefits such as increased aerobic capacity, increased endurance, increased muscular strength, assistance with weight loss, psychological benefit: decreased stress, depression and give socialization for that activity. Cochrane T at al. (2005) reported: Group-based exercise in water over 1 year can produce significant reduction in pain and improvement in physical function in older adults with lower limb OA, and may be a useful adjunct in the management of hip and/or knee OA (Cochrane et al., 2005). Fransen M et al. (2014) reported the

conclusions: Pooling the results of 10 RCTs demonstrated that land-based therapeutic exercise programs can reduce pain and improve physical function among people with symptomatic hip OA (Fransen et al., 2014). Larmer PJ (2014) conclude that exercise and education is important thing in the management of OA hip (Larmer et al., 2014).

Fernades L et al (EULAR - 2013) give 11 recommendation for the non pharmacological management of knee and hip osteoarthritis such as biopsychosocial approach, education, exercise, weight loss, life style changes, walking aid (Fernandes, 2013).

Table 3: Pharmacological recommendation for the initial management of hip OA.

<p>We conditionally recommend that patients with hip OA should use one of the following:</p> <ul style="list-style-type: none"> Acetaminophen Oral NSAIDs Tramadol Intra articular corticosteroid injections <p>We conditionally recommend that patients with hip OA should not use one of the following:</p> <ul style="list-style-type: none"> Chondroitin sulfat Glucosamine <p>We have no recommendation regarding the use of the following:</p> <ul style="list-style-type: none"> Topical NSAIDs Intra articular hyaluronate injection Duloxetine Opioid analgesics
<p>*No strong recommendation were made for the initial pharmacologic management of hip osteoarthritis (OA). For patients who have an inadequate response to initial pharmacologic management see the Results for alternative strategies. NSAIDs: non steroidal anti inflammatory drug</p>

Table 4: Non Pharmacological recommendations for the management of hip OA

<p>We strongly recommend that patients with hip OA should do the following:</p> <ul style="list-style-type: none"> Participate in cardiovascular and /or resistance land based exercise Participate in aquatic exercise Lose weight (for persons who are overweight) <p>We conditionally recommend that patients with hip OA should do the following:</p> <ul style="list-style-type: none"> Participate in self-management programs Receive manual therapy in combination with supervised exercise Receive psychological intervention Be instructed in the use of thermal agents Receive walking aids, as needed <p>We have no recommendation regarding the following:</p> <ul style="list-style-type: none"> Participation in balance exercises, either alone or in combination with strengthening exercise Participation in Tai Chi Receive manual therapy alone
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Table 5: Recommendations for hip OA: non pharmacological therapies.

Land-based exercise	1A	2A
Aquatic exercise	1A	2A
Lose Weight	1A	2A
Self-management program	1B	X
Manual therapy and physiotherapy	1B	X
Psychological intervention	1B	X
Thermal agents	1B	2B
Walking aids	1B	2B
Balance exercises	1C	X
Tai Chi	1C	X
Manual therapy alone	1C	X
Electrotherapy	X	2B
Therapeutic ultrasound	X	2B
Pulsed magnetic field therapy	X	2B

Acupuncture	X	2B
Ergotherapy	X	2B
Manual massage	X	X
Mudpacks	X	X
Manual LD	X	X

A. Strong. B Moderate. C Unable to recommend. X not mentioned

3 CONCLUSIONS

Practice points Rehabilitation of musculoskeletal degenerative conditions should be patient-centered and active participation should be emphasized (Stemberger et al., 2013). Exercise therapy should be the mainstay therapy when possible, with physical modalities utilized as an adjunct. Evaluate and correct for abnormal biomechanics, using assistive devices and orthosis as necessary. Pain-related fear will trigger avoidance of specific movements and physical activity in general, called fear of movement, which in turn will lead to deconditioning. In other words, the muscles are getting weaker, cardiovascular capacity will decrease and as a result, not only is pain aggravated (Hanada, 2003), but disability, lower quality of life and depression are also observed (Marks, 2015 ; Stemberger et al., 2013).

REFERENCES

- Lespasio MJ, Sultan AA, Piuze NS, et al. 2018. Hip osteoarthritis: A primer. *Perm J*, 22:17-084. DOI: <https://doi.org/10.7812/TPP/17-084>
- Bennell K. 2013. Physiotherapy management of hip osteoarthritis. *Journal of Physiotherapy*, 59: 145-57.
- Suri P, Morgenroth DC, Hunter DJ. 2012. Epidemiology of osteoarthritis and associated comorbidities. *Physical Medicine and Rehabilitation*, 4: S10-S19
- Lohmander LS, Englund PM, Dahl LL, Roos EM. 2007. The long-term consequence of anterior cruciate Ligament and meniscus injuries: osteoarthritis. *American Journal of Sports Medicine*, 35: 1756-79
- Marks R. 2015. Non-operative management of hip osteoarthritis. *Pain Studies and Treatment*, 3: 7-22. <http://dx.doi.org/10.4236/pst.2015.32002>
- Stemberger R, Kersch-Schindl K. 2013. Osteoarthritis: physical medicine and rehabilitation – nonpharmacological management. *Wien Med Wochenschr*, 163:228–235. DOI 10.1007/s10354-013-0181-9
- Talmage DM, Lemke CL. 2001. Common conditions of the lower extremity. In: Bougie JD, Morgenthal AP, eds. *The aging body. Conservative management of common neuromusculoskeletal conditions*. New York: McGraw-Hill Companies, 205-42
- Hanada EY. 2003. Efficacy of rehabilitative therapy in regional musculoskeletal condition. *Best Practice & Research Clinical Rheumatology*, 17: 151-66
- Uusi_Rasi K., et al., 2017. Exercise training in treatment and rehabilitation of hip osteoarthritis: a 12-week pilot trial. *Journal of Osteoporosis*, 1-7
- Talmage DM, Lemke CL. 2001. Common conditions of the lower extremity. In: Bougie JD, Morgenthal AP, eds. *The aging body. Conservative management of common neuromusculoskeletal conditions*. New York: McGraw-Hill Companies, 205-42
- Nadler SF. 2004. Non pharmacologic management of pain. *JAOA*, 11(8): 6-12
- Cochrane T, Davey RC, Matthes Edwards SM. 2005. Randomised controlled trial of the cost-effectiveness of water-based therapy for lower limb osteoarthritis. *Health Technol Assess*, 9(31):iii-1v, 1x-xi,1-114
- Fransen M, McConnell S, Hernandez-Molina G, Reichenbach S. 2014. Exercise for osteoarthritis of the hip. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD007912. DOI: 10.1002/14651858.CD007912.pub2.
- Larmer PJ, et al., 2014. Systematic review of guidelines for the physical management of osteoarthritis. *Archives of Physical Medicine and Rehabilitation*, 95:375-89
- Fernandes L. 2013. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis. *Ann Rheum Dis*, 72:1125–1135. doi:10.1136/annrheumdis-2012-202745
- Hochberg MC., et al., 2012. American college of rheumatology 2012 recommendations for the use of nonpharmacologic and pharmacologic therapies in osteoarthritis of the hand, hip, and knee. *Arthritis Care & Research*, 64: 465-74