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Review Article

An Overview of Arthritis: It's Prevalence and Updated Therapies for the Management of Arthritis

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ABSTRACT

The purpose of this study was to review the literature and current guidelines for the surgical and non-surgical treatments of arthritis. Despite the fact that the published guidelines offer well-known assistance, the complexity of underlying mechanisms requires that measures designed to relieve pain. Although, surgical management consists of arthroscopy, osteotomy, arthroplasty and exercise programs for non-surgical management and it has been proven to be effective. It follows that the combination of both pharmacological and non-pharmacological strategies offers a pleasant possibility of therapeutic success, although it remain difficult to establish the effectiveness of such complex interventions. Pharmacological therapy is often prolonged and tolerance problems prove to be as important as effectiveness over time. Recently systematic reviews and individual studies confirm the effectiveness of aerobic and strength exercise programmes and evidence for the promotion of physical activity according to public health recommendations. For exercise, physical activity programmes and self-management interventions in arthritis, research is increasingly focused on optimizing their content, intensity, frequency, duration, mode of delivery and effective implementation techniques. They are recommended in young and energetic patients in regard to the risks and limited durability of total knee replacement and this is a safe method in the elderly patients. Its treatment should be initially non-operative and requires both pharmacological and non-pharmacological approaches. This issue has been addressed over recent months in updated guidelines and these guidelines describe three treatments: non-pharmacological, pharmacological and surgical. This paper summarizes current surgical and non-surgical treatment strategies and focuses on the latest advances and evidence.

INTRODUCTION

The word arthritis can be derived from the Greek word means "for joint inflammation" and mainly affects the joints in the body [1]. Arthritis can be a disease of chronic joint pain and inflammation of the joints. Arthritis is of 200 types that are associated with joints, and other connective tissues. The characteristics of arthritis are continuous pain within the joint which locates within the affected joint and then worsens with daily joint loss, the muscle strain caused by heavy movements in relation to stiff and painful joints.

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Arthritis shows heavy morbidity of pain, decreased flexibility, and swelling in and around one or more joints called rheumatic conditions [2]. The most prevalent chronic disease among individuals aged 65 years and older is arthritis and its prevalence increases after the age of 45 years, occurring in up to 50% of older adults [3]. The pain of arthritis is common and related to worse functional outcomes and poorer quality of life once we compare it with other ranges of chronic conditions. Mediators released from the synovial membrane or other tissues induce local sensitization of joint pain receptors. Clinical experience has shown that the goal of systemic or topical therapies is aimed at reducing the number of inflammatory mediators which may indicate a beneficial effect in chronic conditions

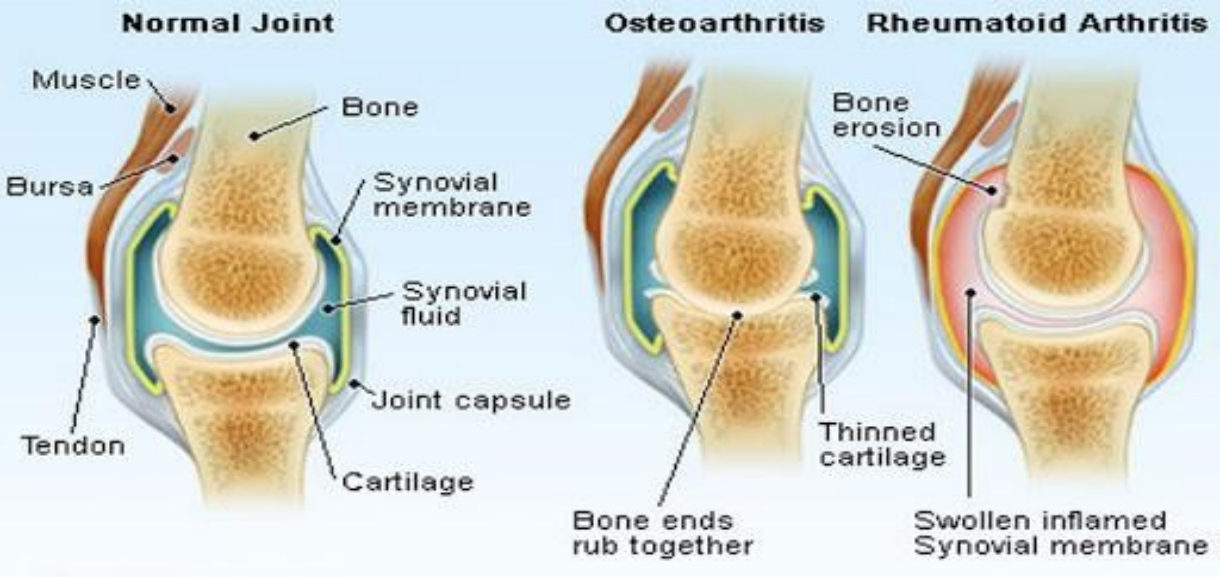

Figure 1: Comparison between the normal and arthritic joints where osteoarthritis occurs when the protective cartilage that covering the ends of the bones in the joints and slowly deteriorates, and in case of rheumatoid arthritis, the immune system attacks the synovial membrane, which causes inflammation [5].

like osteoarthritis. Psychological and social factors are the foremost important predictors of both the presence and severity of pain in RA, OA [4].

1. Causes of Arthritis

1.1 Age:

Increased laxity around joints, reduced joint proprioception, cartilage calcification, and reduced chondrocyte function all thanks to the traditional ageing process which results in a propensity for osteoarthritis. The Framingham Study shows radiographic evidence of knee osteoarthritis found in 27% of these aged 63 to 70, increased to 44% within the over 80 age bracket, but other studies have found that 80% of individuals over the age of 65 have some radiographic evidence of osteoarthritis but that incidence and prevalence of symptomatic osteoarthritis leveled off or declined in men and ladies at around 80 years aged.

1.2 Gender and Ethnicity:

Under age 50, men have a better prevalence than women. The differences between men and women become less marked after the age of 80. Osteoarthritis is usually commoner in Europeans than in Asians. Europeans (7%–25%) have more common Osteoarthritis of the hip than Chinese. European women have more common osteoarthritis of the hand than in women of Afro-Caribbean descent.

1.3 Genetics:

Identical twins are more resistant to osteoarthritis than diabetic twins and are genetically more susceptible to disease. Several Families with rare dominant arthritis genotypes have been identified. Children of parents with early onset osteoarthritis are at higher risk of developing it themselves compared with families where this is often not the case.

1.4 Obesity:

Obesity is that the strongest modifiable risk factor. During walking three to 6 times the weight is transferred across the knee. When an overweight patient walks, a rise in weight should be multiplied by this factor to estimate the surplus force across the knee. Increasing weight increased the danger of contralateral osteoarthritis of the knee in women with established osteoarthritis of one knee. Losing 5 kg of weight reduced the danger of symptomatic knee osteoarthritis in women of average height by 50%.

1.5 Diet:

People having lower tertile of vitamin C and vitamin D blood levels had a threefold risk of progression of knee osteoarthritis. Individuals taking vitamin D had no effect on development of knee osteoarthritis but those with low intake and low serum levels had an increased risk of osteoarthritis knee progression whether vitamin E has not been shown to be of benefit.

1.6 Bone Density:

Relationship between bone density and osteoarthritis is inverse. Increasing subchondral bone density may cause increased loading through weight bearing joint cartilage [6].

2. Global Status of Arthritis

In Worldwide from 27.6% prevalence of arthritis from which around 18% of girls and 9.6% of men are universally reported with symptomatic arthritis in 60 years and better age groups. In India there's 33.8% prevalence of arthritis, therefore with Increase in age exponentially increases the allied risk of Arthritis, thanks to progressive changes in routine diet, working milieu conditions and lifestyle patterns. India is predicted as a chronic disease capital by 2025 and expected to possess 60 million people with arthritis.

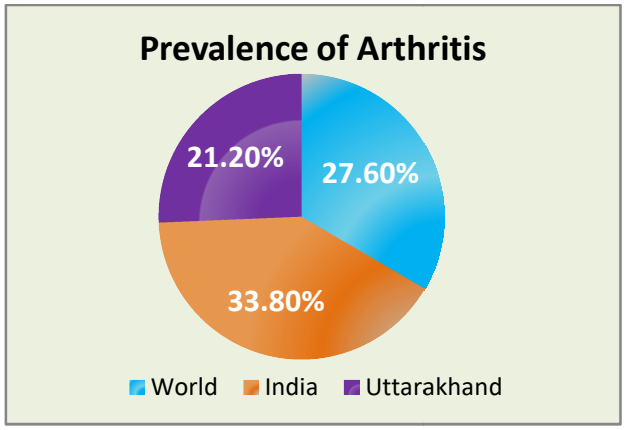

Figure 2: Contribution in prevalence of arthritis like in worldwide from 27.6% prevalence, India there's 33.8% prevalence of arthritis and in Uttarakhand has 21.2% prevalence of arthritis [7].

Table 1: Prevalence of Arthritis in Different State of India [7].

State	Prevalence of Arthritis (in %)
Uttar Pradesh	78.27
Andhra Pradesh	68.0
Delhi	47.3
Assam	43.0
Karnataka	41.3
Jammu & Kashmir	24.9
Bihar	21.4
Uttarakhand	21.2
Tamil Nadu	18.6
Bangalore	17.0
Maharashtra	10.2
Rajasthan	3.66

It shows the percentage distribution of arthritis reported in several states of India. According to their increasing order like Uttar Pradesh (78.27) to Rajasthan (3.66) and mainly focused on Uttarakhand has 21.2% prevalence of arthritis from which 12.8% of men and 14% of women [7].

3. Types of Arthritis

3.1 Rheumatoid Arthritis:

Rheumatoid arthritis is defined as a chronic disease mediated by the immune system that's characterized by chronic progressive inflammation followed by destruction of peripheral joints, ligaments and tendons [8]. Multiple Inflammatory cytokines activates macrophages leading to swelling of joints, cartilage damage, erosion of bone and stiffness [9].

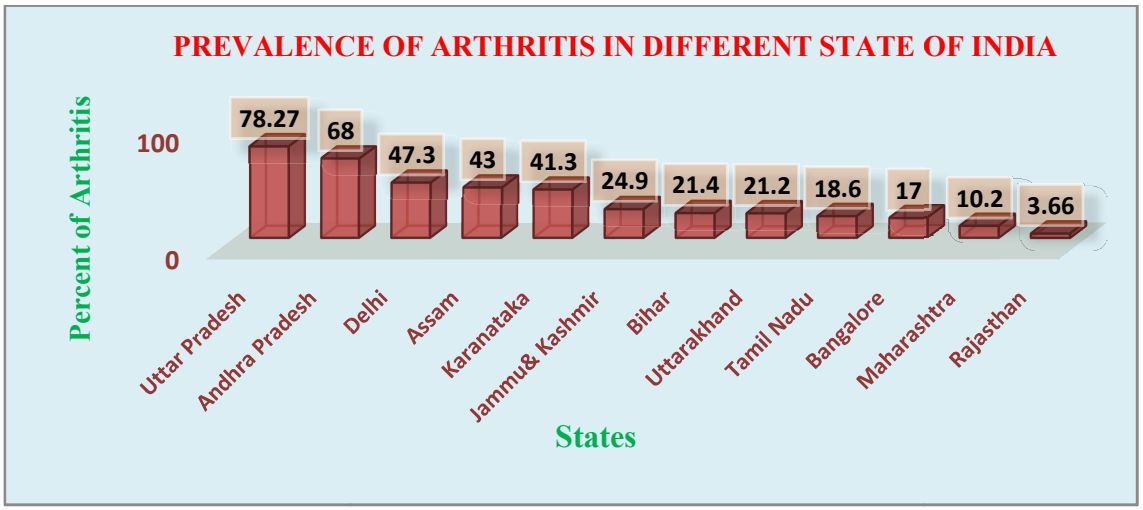

Figure 3: Graph between state and percent of arthritis cases reported in several states of India. According to their increasing order like Uttar Pradesh (78.27) to Rajasthan (3.66) [7].

Pathogenesis: It consists of a complex process - involving the formation pannus, the proliferation of synovial fibroblast causing infiltration of T-cells, B-cells, macrophages and plasma cells. In RA mediators form a network of interdependent system including various cytokines, tumor necrosis factor and interleukins that stimulate a pro-inflammatory response on the cell .Hence, aim of treatment is to stop joint destruction by improving functional performance, decreasing pain & inflammation [9]. The normal synovial lining is usually a few cells thick and consists of fibroblastic cells called 'synoviocytes' alongside macrophages. In RA, the synovial lining expands dramatically in combination with impaired growth of synoviocyte to make a structure called 'pannus' known as pannus formation. The synovial fibroblast in RA becomes destructive and produces mediators that degrade cartilage and joints. Due to proliferation of synoviocytes, the joint, including the synovium, exhibits intense inflammation which is the result of the interactions of B cells, T cells, macrophages and neutrophils, all operating locally to supply cytokines and other pro-inflammatory mediators. Among these mediators are the cytokine, TNF-alpha, a product of macrophages and other immune populations. Two autoantibodies are of great significance as diagnostic and prognostic markers. Rheumatoid factor and antibodies to citrullinated proteins. RF is an immunoglobulin IgM antibody directed against IgG and is considered an autoantibody and may have a physiological function in host defense of enhancing the activity of IgG antibodies. RFs are common in infectious and inflammatory diseases and occur in approximately 80% of RA patients. Although sensitive markers for diagnosis of rheumatoid factor aren't specific to RA but ACPAs are highly specific to rheumatoid arthritis. ACPAs antibodies are directed against proteins containing citrulline [10].

3.2 Osteoarthritis:

It is the commonest sort of arthritis that gets worse when the cartilage wears out and tears. Rupture of Articular cartilage may be an important characteristic of osteoarthritis and other joint tissues, including the synovium, ligaments and subchondral bone are actively participate within the progression of the disease [11]. It is a chronic disease of musculoskeletal system, that affects movable joints, like knee and hip joints [12]. Osteoarthritis can arise in any articulation synovial is within the body, most ordinarily within the hands, knees, hips, and spine. In osteoarthritis one joint might be involved, but it often affects several joints and the disease closely related to age, being less common under 40 years, but rising in frequency with age in most people, such most of the people older than 70 years have radiological evidence of osteoarthritis in some joints [13].

The pathological changes in osteoarthritis include degradation of the articular cartilage, thickening of the subchondral bone, formation of osteophytes, varying degrees of inflammation of the synovium, degeneration of ligaments, within the knee, and hypertrophy of the joint capsule. There may also be changes in peri-articular muscles, nerves, and muscle around the local fat pads that contribute to osteoarthritis [14]. It has a crucial inflammatory component that has increased activity of cytokines and chemokines in certain joints. These inflammatory cytokines and chemokines drive the assembly and secretion of enzymes that mediate destruction of cartilage [15].

Pathogenesis:

Osteoarthritis is an idiopathic disease characterized by the degeneration of the articular cartilage. Breakdown of the cartilage matrix leads to fibrillation and rupture, leading to severe caries resulting in loss of the entire posterior articular surface. It is often associated with bone changes with osteophyte formation and thickening of the subchondral plate. In addition, the clinical stage of arthritis includes not only cartilage but also the synovium, where an inflammatory response is usually observed [16].

Glycosaminoglycan produced by chondrocytes are proteoglycans, that sequentially bind to hyaluronic acid and stabilize larger molecule. Chondrocytes feed through the synovial membrane, which moves with the movement of the joint. When the movement of the joint stops, fracture or immobility occur, and the energy supply to the cartilage cell is lost and cartilage is impacted, which is thought to stop the repair of the cartilage. Metalloproteinase are produced, which catalyze collagen and proteoglycan degradation. The synovium has been shown to be variably inflamed in osteoarthritis producing increased levels of interleukin-1 and TNF-α, cytokines which induce inflammation in osteoarthritis and stimulate gas and

metalloproteinase production.Interleukin-6 and mechanical loading on joint stimulate catabolic cytokine receptors. IL-1 and TNF-α bind to cartilage and cause further destruction.The osteophytes and subchondral sclerosis seen in osteoarthritis could also be the body's way of trying to catch up on lack of cartilage, but some researchers have found bony changes before cartilage changes in animal models. This type of abnormal bone is thought to damage the surrounding cartilage. Inactive insulin-like protein may also result in poor cartilage synthesis and reworking growth factor beta agents which normally promote new cartilage formation [6].

4. Principles for the Management of Arthritis

They are classified into 2 options:

1. **Surgical Options** [17]
   - I. Arthroscopic lavage and debridement
   - II. Osteotomies
   - III. Arthroplasty (Joint replacement)

2. **Non-Surgical Options** [17]
   - **I. Non-Pharmacological options**
     - **a.** Patient Education
     - **b.** Lifestyle modification
       1. Exercise
       2. Weight loss
     - **c.** Physical Therapy
       1. Strength training
       2. Physiotherapy
     - **d.** Biomechanical interventions
       1. bracing
       2. foot orthoses
     - **e.** psychological therapies
   - **II. Pharmacological options**
     - **a.** Oral therapy
     - **b.** Topical Therapy
     - **c.** Intra-articular injection

4.1 Surgical options

Table 2: Surgical Options for Knee Arthritis [18]

Type of Surgery	Type of Surgery
Arthroscopy	Normally aligned arthritis Mild arthritis Increasing pain
Osteotomies	Younger patients (age <60 year) Ligament stability
Arthroplasty	Older patients (age >70 year) Moderate to severe arthritis

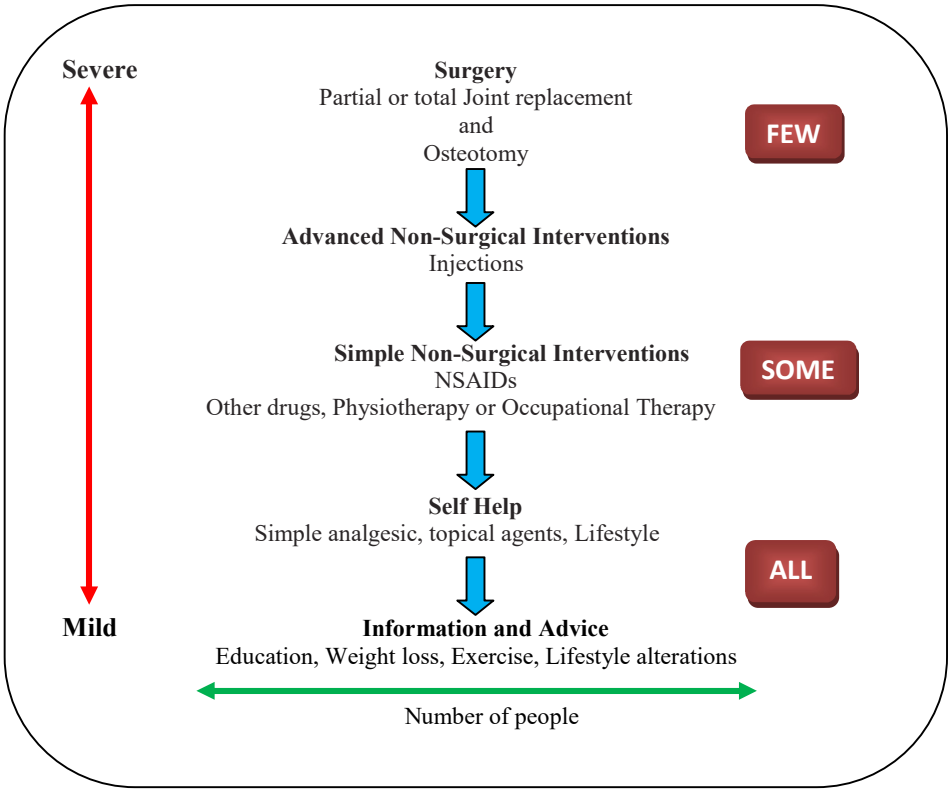

Figure 4: Outline some general principles that we believe that are important for good management of people with this arthritic condition [13].

3 types of Knee Arthritis surgical options and their ideal candidate for surgery in Arthroscopy, Osteotomies and Arthroplasty, have different patients with mild arthritis, ligament stability and pain so they are choosing the options for surgery [18].

I. Arthroscopic Lavage and Debridement:

This is a less invasive method than joint replacement. The surgeon removes the damaged cartilage and cleans the joint to prevent further joint deterioration. Arthroscopic techniques include knee lavage and wound resection [18]. Arthroscopy should relieve symptoms by removing the damaged tissue and inflammatory cytokines that cause synovitis and debridement can remove torn meniscal fragments and loose cartilage flaps. According to one study, arthroscopic debridement may also help temporarily relieve symptoms in carefully selected patients with arthritis of the knee. Arthritis patients are less likely to recover from X-rays, have less cartilage involvement and are younger at the time of surgery. The short term pain, mechanical symptoms, and mild to-moderate arthritis are all associated with better outcomes. However, patients with symptoms of meniscus tear or laxity may benefit from osteoarthritis [19].

Figure 5: (a)anterior-posterior view; **(b)** lateral view, (Radiograph of a 69 years old women with moderate osteoarthritis of her right knee and narrowing of the medial compartment, irregularities and sclerosis of the articular surface and small marginal osteophytes are apparent [20].)

For mild knee arthritis, initiation of arthroscopic debridement is recommended. This is because you can expect rapid improvement of symptoms and function without serious complications after surgery. Clinically arthroscopic knee joint lavage alone, may help relieve symptoms in patients with mild knee OA. Therefore we hypothesized that arthroscopic knee lavage should be as effective as intra-articular debridement in a group of patients with mild joint degeneration [20].

II. Osteotomy:

In an osteotomy, the surgeon will remove a part of the bone. This is often done to improve joint alignment and reduce stress on the joints area by repositioning the bones within the joint. This helps reduce pain and other joints symptoms [18].

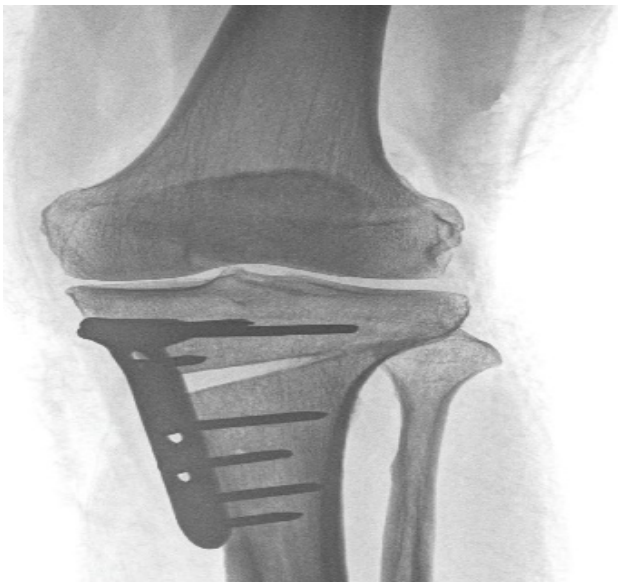

Figure 6: Unloading osteotomy**,** there is an Unloading osteotomy in which, exemplary a valgisation open-wedge high tibial osteotomy in uni-compartmental arthritis of the medial knee compartment. The corrected position is stabilized by a plate with angular locked screws [19].

Knee osteotomy is an acceptable method for the treatment of uni-compartmental arthritis due to valgus deformity. Osteotomy has become a common treatment for uni-compartmental knee arthritis. The classic osteotomy of Coventry was a closed-wedge valgization including afibula osteotomy and was administered proximal to the tibial tuberosity. This was the foremost widely used technique for an extended time. Good knee mobility may be a prerequisite and as ligament stability. Age is an important factor to consider. Age >60–65 years may be a relatively contraindicated, but age and biological activity also be considered. Ideally, before performing osteotomy, clinical finding and arthroscopic radiographs of the knee should be used to confirm normal position. This includes proximal tibial head osteotomies and supracondylar femoral osteotomies. Good results can be obtained during the first few years of follow up,

nut they tend to deteriorate over time. Knee osteotomy is an effective way to select young, active, and appropriate arthritis patients. Advance planning, careful surgical technique, and proper postoperative care can minimize complications and provide satisfactory results.However, it has been shown to be efficient in relieving pain and improving function [19].

III. Joint Arthroplasty:

In joint arthroplasty sort of surgery, the surgeon replaces the whole joint or simply a neighborhood of the joint using artificial parts. These artificial parts are commonly made from plastic or metals, like titanium [18].

Figure 7: Treatment of an isolated medial compartment arthritis by uni-compartmental arthroplasty [19]

Joint arthroplasty may be an acceptable, safe, and inexpensive way to treat advanced arthritis. Due to its irreversible nature, joint arthroplasty is recommended for patients who have failed other treatments or contraindicated. Although the lifespan of prosthetic components is limited to about 15–20 years but the survival of uni-compartmental arthroplasties is usually inferior. Therefore, in patients younger than 60 years of age, intra-articular surgery should be avoided as much as possible [19]. A uniform strategy has got to be figured out for every patient because many joints are involved even in one extremity. Often the hip and knee joints need to be replaced side by side. If this happens frequently, the pelvis must be replaced before the knee, and the knee or hip replacement can be done in a different location.

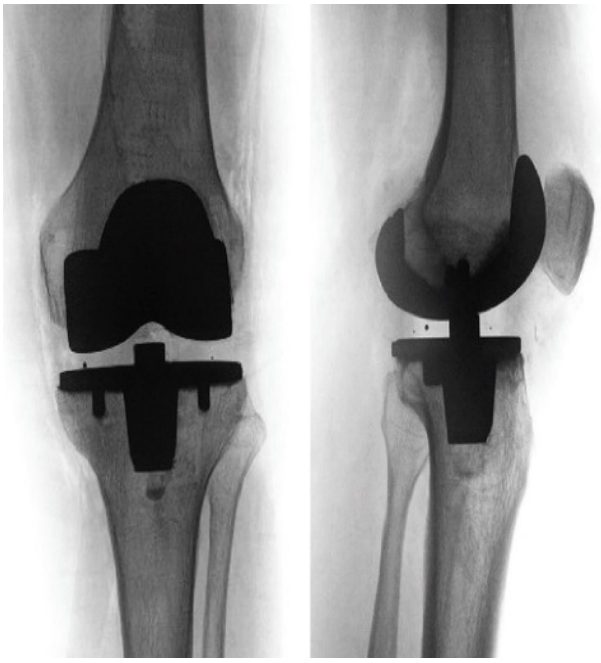

Figure 8: Treatment of advanced knee arthritis by total knee arthroplasty **[19]**

For the upper extremities, the shoulder and elbow are good candidates for arthroplasty. Within the shoulder deformity and muscular situation are responsible if a hemi arthroplasty or an inverse design should be the selection [21].

4.2 Non-surgical options

I. Non-Pharmacological Options

a. Patient Education and Self-Management Programs:

In randomized controlled trials, Patient education and self-help courses are cost-effective and are associated with pain relief, increased well-being, and increased knowledge, reduced use of healthcare services and increased compliance with exercises, and these effects are shown to be sustainable for up to 12 months. It is found in patients with arthritis. Self-management education is recommended in all published evidence-based guidelines for the treatment of arthritis. These programs include disease processes related information, medications and their actions and reactions, alongside goal setting for exercises and pain management strategies. They specialize in patients who can better control their disease [22]. The guidelines aim to provide patients with detailed information about arthritis and its course, characteristics, research, and treatment

options. Counseling can take the form of a telephone or group sessions training programs and is combined with other therapeutics approaches [23]. This involves enabling the patient to know the disease process affecting them via dissemination of data within the doctors'. These interventions has been shown to decrease pain and improve overall quality of life in patients suffering from Arthritis [24].

b. Lifestyle Changes through:

1. Exercise:

Exercises can help with various disease (osteoporosis, depression) that can affect older people. Arthritis often improves physical condition and strength without worsening symptoms. In general, reduced activity in arthritis can lead to a sharp decline in function. Several major studies have shown significant improvements in maximum aerobic capacity and muscle strength in just six weeks. One among the main issues concerning arthritis and exercise is learning how to manage fatigue. Fatigue can be a common complaint of chronic pain condition. Patients' needs help to manage the fatigue with the gradual introduction of exercises. All published guidelines for the treatment of arthritis include recommendations for exercises such as aerobic and strengthening. Recent studies on the effects of physical therapy on arthritis patients and support the benefits of exercise, but conclude that there is insufficient information to recommend the type and component of exercise [22]. The purpose of exercise is to relieve and improve pain. Vigorous exercise can strengthen the muscle around the knee. Recent studies have revealed an important role for exercise in the treatment of arthritis and the type of exercise has various benefits in treating arthritis [23].

As being overweight is also a major risk factor for osteoarthritis, so exercise programs aimed toward increasing energy expenditure and fitness and resulting in weight loss should help to decrease the load on the involved joint and reduce pain [22].

2. Weight Reduction:

Overweight are identified as major risk factors for arthritis. Many people with arthritis, especially women, are overweight. Obesity may be documented as a risk factor for development of knee arthritis [22]. Obesity is closely associated with an increased risk of arthritis, the need for joint replacement, and physical disability. The most important form of weight management is a lifestyle change. This may include reducing your diet, increased physical activity, or taking anti-obesity medications. In severe cases, surgery like gastric bypass is recommended [23]. There's also good epidemiological evidence that weight gain is strongly associated with radiological progression and disability of arthritis [22]. A recent study provide evidence for the importance of weight change in reducing knee pain by over 50%, 10% after weight loss [23]. Although, some studies of weight management programs have shown reduced symptom, there are no randomized studies yet to show whether weight loss can slow the progression of the arthritis. However, in general benefits of weight loss such as exercise should be the focus of treatment for arthritis [22]. Therefore, one of the main treatments prescribed for obese arthritis patients is weight loss [17].

c. Physical Therapy:

1. Strength training

Physical therapy is one of the most common treatments for arthritis and includes many treatments and methods. Recent studies have shown that the thigh muscles are the most affected. Conversely, a recent systematic review found that muscle training could improve the knee strength but on pain and functional impairment. Physical therapy techniques include a variety of physical interventions: TENS, electro-acupuncture and therapeutic ultrasound [17].

2. Physiotherapy

Knee physiotherapy aims to readjust the extension of the thigh muscles that normally dominate by these muscles. These methods are currently central to knee pain management for knee and ligament injuries and use different approaches to achieve similar overall goals. Physical therapy is widely used in the conservative management of ligamentous knee injuries to increase muscle strength, improve pro-prioception and reduce inflammation with the goals of a full return to physical activity [25].

d. Biomechanical Intervention:

1. Bracing and Foot Orthoses

Biomechanical and walking canes aren't included in the Hong Kong LLOA guidelines but are considered appropriate and effective under the OARSI guidelines. A review of the literature suggests that knee braces and orthoses may have a positive effect on

decreasing pain and stiffness and improving body function. This is not yet complete due to the lack of clinical trials and irregular interventions between studies [23]. The progression of arthritis is often associated with biomechanical damage to the knee. These patients require significant experience with knee behavior in the early stages of arthritis treatment. A specific brace uses opposing valgus force to scale back overload on the medial knee compartment, while foot orthoses change the mechanical axis of the leg by enhancing the valgus correction of the calcaneus. OARSI guidelines recommend these options to reduce back pain back pain, analgesic, stiffness and disease progression [17]. Knee braces are a simple and effective aid to treating knee pain. There are many benefits to using this type of orthoses. This study did not increase joint depth but showed relief from pain. These braces are specifically designed to protect certain ligament, it's important to make an accurate diagnosis before prescribing a knee brace [25]. Orthoses are widely used to treat people and useful for arthritis. In a qualitative study among women with arthritis in three European countries, the need for footwear for patient can also be complex, so doctors can better influence the social and emotional impact of the therapeutic use of footwear [26].

e. Psychological Therapy:

Psychological support is often obtained through external support and guidance from qualified staff or by equipping patients to exercise and use their ability to care for themselves [27]. Depression can be a strong predictor of fatigue in arthritis. In fact, energy deficiency is one of the diagnostic criteria for depression, even in people without atrophic arthritis. Perceived stress can also have direct and indirect effects on arthritis stress. Daily stress with high self-assessment predicted increased fatigue after one month. Chronic psychological stress is associated with increased IL-6 level, which is associated with increased self-reported fatigue. Perceived stress has also been linked to sleep disturbances associated with arthritis [28]. Several studies have shown a link between a person's mental state and severity of knee pain associated with arthritis, especially depression. Psychotherapy, especially cognitive-behavioral therapy, is widely used and has been shown to be effective in the treatment of depression, anxiety, and pain relief. Some recent systematic reviews have found that these treatments can relieve chronic pain. These results are still promising. Treatments could relieve the risk of side effects and reduce arthritis of the knee [17].

II. Pharmacological Options

Oral pharmaco-therapies include analgesic drugs (paracetamol, NSAIDs, opioids, antidepressants, and capsaicin) and Topical pharmaco-therapies include capsaicin.

a. Oral Therapy:

Paracetamol (Acetaminophen)

Paracetamol is the most common pain reliever, including arthritis. Recent studies have shown that acetaminophen has a mild to moderate effect in reducing knee pain and there is strong evidence.A systematic review with relatively good evidence reported mild to moderate effects on pain relief in arthritis [17]. Paracetamol is effective in many cases of arthritis and at any age. Oral analgesics are preferred for mild to moderate arthritis pain and patients with arthritis are generally advised to remain well tolerated for up to 12 months. Paracetamol is generally well tolerated and has extensive safety documentation, but these days, its use alone may slightly increase the risk of high blood pressure. A popular item for moderate arthritis pain and long-term relief in terms of effectiveness, safety and cost [23].

NSAIDs

The primary anti-inflammatory and analgesic effects of NSAIDs are associated with the inhibitory effects of cyclooxygenase and subsequent reduction of inflammatory prostaglandins like PGE2. NSAIDs have been shown to be very effective in the treatment of acute pain and are one of the most important drugs for the treatment of arthritis pain [4]. NSAIDs can be given orally or used topically. Non-specific cyclo-oxygenase inhibitor inhibits both cyclo-oxygenase-1 and cyclo-oxygenase- 2 while the selective alternative inhibits only cyclo-oxygenase-2 [17]. Although NSAIDs have a significant effect on pain, patients often prefer acetaminophen over NSAIDs. Dissatisfaction between patients treated with NSAIDs and physicians is evidenced by observational studies in which less than 20% of knee arthritis patients who start NSAIDs treatment continue to take similar medications after 12 months [29]. Published guidelines and expert opinion on the relative roles of NSAIDs and acetaminophen as first-line analgesics for arthritis are mixed. Although NSAIDs are widely used to treat

arthritis symptoms, similar moderate effects have been observed [4]. Patients and healthcare professionals are concerned about the serious and life threatening gastrointestinal side effects associated with the use of non-selective NSAIDs [29]. Topical and oral NSAIDs have significant advantage and benefits over placebo. Topical medications have a lower gastrointestinal risk, but have more serious side effects on the skin [23]. Although, topical NSAIDs are effective for symptoms of arthritis of the knee, they are tolerable and safer than oral NSAIDs [17].

Antidepressants

In patients with arthritis, randomized controlled trails and scientific studies have concluded that pain may be relieved and functional outcomes may be improved with acceptable side effects. For tricyclic antidepressants, there is insufficient evidence in the literature to recommend their use in the treatment of arthritis [17]. The analgesic effect of antidepressants is independent of their effects on depression and occurs after short-term, low dose treatment. Tricyclic antidepressants have the simplest analgesic effect and block the absorption of norepinephrine and serotonin. Although the most common pain symptom of tricyclic antidepressants is neuropathic pain, they also have beneficial effects in patients with fibromyalgia and back pain [4].

Opioids

Opioids having the severe side effects and therefore the physical dependence risk, opioid should be reserved for patients as an alternate to pain analgesic, and used at low potency with under close observation [17]. Long-term use of potent opioids in chronic musculoskeletal disorders is controversial. Receptor agonists have the simplest analgesic effect but are more likely to be abused. Although there is relatively little evidence to support the use of codeine and other pain relievers alone for arthritis pain, these factors prevent serious side effects in the extremities and are clinical for long-term treatment when combined with acetaminophen. In patients with arthritis where NSAIDs are contraindicated or combination therapy is ineffective, the use of stronger opioids may play a limited role. Recent advances in oral and transdermal formulations have improved the safety and application of effective extended release opioid therapies. In fact, toxicity remains a problem. The foremost commonly reported opioid side effects are constipation, nausea. Despite patient education, exercise, and medicine increases the likelihood of patient compliance with treatment guidelines, also as improving functional capacity and quality of life [4].

b. *Topical Treatments:*

Topical capsaicin creams are often used in patients with moderate pain in the hands and knee. Several studies have shown the effect of capsaicin on arthritis. There is little evidence that topical NSAIDs are effective [6].

c. *Two Intra-Articular Injections:*

Intra-articular steroid injections are widely used to control symptoms of arthritis and inflammatory conditions. Remission of osteoarthritis symptoms is also relatively short and lasts up to 2 weeks, but rheumatoid arthritis has a longer response [4].

a. Corticosteroids injection**-**Corticosteroids are short-term pain and physical therapy. This limited effect has been confirmed by the OARSI guidelines and recommend the use of corticosteroid injection only for short-term pain relief. A long-term decline in efficacy is a recent meta-analysis that corticosteroids are short-acting drugs, with non-specific outcomes between 6 weeks to 6 months, followed by ineffectiveness [17].

b. Intra-articular Hyaluronic Acid-Intra-articular injections of HA has been used with great interest in recent years for the treatment of arthritis pain that is not controlled by non-pharmacological intervention programs. Manufacturers suggest that intra-articular hyaluronic acid treatment is the basis for clinical improvement, which temporarily increases synovial fluid viscosity, although viscosity increases may persist for months after treatment in some patients. Overall, these studies show only mild to moderate benefit of IAHA treatment. Intra-articular injection of hyaluronic acid is expensive, has few benefits, has no systemic effect, and is less expensive to treat because it reduces the patient NSAIDs dose, reducing the risk of gastric ulcer and ulcer-related complications. Therefore, the cost of regular laboratory studies to monitor treatment with chronic NSAID was necessary. However, there's no evidence to suggest reducing the NSAIDs dose or discontinuing the NSAIDs in patients with IA HA, and recent studies have did not show that HA treatment is

best than IA injections of saline or enzymatically degraded HA [29].

Table 3: Current Pharmacological Options in the Management of Arthritis [30]

Therapy	Options
Oral therapy	Acetaminophen NSAIDs and COX2 inhibitors
Topical Therapy	Opioids Capsaicin
Intra-articular injections	Corticosteroids injection Hyaluronic acid injections

Some therapies like oral, topical, and intra-articular injections, under which certain medications are used as a Pharmacological options in the management of Arthritis [30].

5. Preferred Route for Management of Arthritis

5.1 Oral Delivery:

Oral administration is the most conventional and preferred method of drug administration. Most drugs used to treat arthritis are taken by mouth. Since the therapy involves frequent administration of drug, chances of patient non-compliance increase. NSAIDs inhibit the COX-I and COX-II enzymes, and reduce pain and inflammation, as well as many side effect such as gastric bleeding, decreased blood flow to the kidneys and liver damage. Oral corticosteroids also cause many systemic side effects like bone loss and osteoporosis. There are several ways to address the risks of oral arthritis medications. Oral indomethacin is of limited use because it causes many dose-related side effects associated with long-term use. To address this problem, long-term release of Indomethacin by granulation and coating has been established [31].

5.2 Parenteral Delivery:

Intravenous products have a unique formulation because they are injected in to the body lumen through the skin or mucous membranes. Despite the benefits of drug injections for arthritis, this route is rarely used because of poor patient compliance, rapid drug release and eventual relapse. Intra-articular corticosteroids are recommended to reduce side effects when taken orally and have been shown to relieve symptoms of arthritis [31].

5.3 Topical Delivery:

It allows the drug to diffuse beyond the structure to the superficial tissues of the skin. The easy handling makes this route more comfortable for the patient and easier for the patient compliance. The drug is absorbed through the intestine more slowly, but penetrates the epidermis very quickly. Once the drug passes through the stratumcorneum of the epidermis of skin, there is no barrier to entry. Topical NSAIDs have been reported to reduce the incidence of systemic side effects like gastric bleeding and peptic ulcer. We evaluated the feasibility of the parenteral route in the treatment of arthritis. Topical methotrexate gel of poloxamer 407 polymer have been shown to produce stable and high levels of the active ingredients in the muscle tissues beneath the site of administration [31]. Among the various drug administration methods for Arthritis, topical treatment has a greater skin protection ability, has a more specific targeted action, has a lower drug dose, has fewer adverse effects, has better absorption and is useful for better observation of patients [32]. According to guidelines from the European League against Rheumatism and National Institute for Health and Care Excellence guidelines, topical NSAIDs are recommended for the treatment of mild to moderate osteoarthritis pain before the oral route [33]. Topical use to increase local soft tissue and joint concentrations by reducing its systemic distribution and preventing side-effects [34].

CONCLUSION

Arthritis is a major public-health problem. In recent years precise development has been made in our knowledge of the many pathogenic pathways that cause pain and joint damage. As a result, it is possible to develop theoretical methods for the early prevention of joint damage, mainly by reducing obesity and joint damage but these strategies can reduce arthritis in the short term. With the appearance of latest treatments through popular interest search engines for a variety of treatment options raises patient expectations and provides opportunities for a quick and safe recovery. Strategies for treating arthritis pain should consider this fact, and may always include medications using both surgical and non-surgical methods. The purpose of this document is to help physicians make right choices and consider surgical and non-surgical options through recently adopted guidelines. Without disease modifying therapy, many people with arthritis develop joint damage. Therefore

surgery plays an important role in the treatment of arthritis. Advances in this field combine scientific knowledge with in-depth research in to the effectiveness and cost-effectiveness of surgical approaches in the treatment of arthritis. If there is one guiding message for physicians in disease management, it is that dosage is an important part of treatment and that non-pharmacological interventions are equivalent. Non-surgical treatment of arthritis is essential to improve outcomes in patients with arthritis and reduce the burden of arthroplasty. Several exercise programs for the treatment of non-surgical arthritis have been shown to improve pain, physical function, quality of life, and these programs reduce the need and waiting instances for joint replacement surgery. This review has to provide a sound basis for clinicians and patients to possess a knowledgeable discussion on treatment options. The management plan is ready-made to supply optimal pain relief and functional benefit, specific to all person at the start of a patient's care.

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