Editorial

Arthritis – A Global Burden

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Introduction

Arthritis is derived from the Greek term "disease of the joints." It is defined as an acute or chronic joint inflammation that often co-exists with pain and structural damage.[1] Arthritis is not synonymous with arthralgia, which refers to pain localized to a joint, regardless of the origin of the pain (which may or may not be due to joint inflammation).

Arthritis is a frequent illness that affects your joints. Inflammation and discomfort may result, making it challenging to move or maintain activity. Inflammation and injury to the joints, surrounding tissues, and other connective tissues are symptoms of more than 100 illnesses collectively referred to as arthritis.

The tendons and ligaments around the joint, however, may also be impacted by inflammation. A person's ability to carry out daily chores may be hampered by the symptoms, which may appear gradually or unexpectedly.

Types of Arthritis

There are over a hundred different types of arthritis. Arthritis may generally be divided into the following categories:

Degenerative or Mechanical Arthritis:

Degenerative or Mechanical Arthritis primarily entail harm to the cartilage that surrounds the ends of the bones. The supple, slippery cartilage's primary function is to facilitate easy gliding and motion in the joints. This kind of arthritis causes the cartilage to weaken and roughen.

The body starts remodelling the bone to restore stability to make up for cartilage loss and changes in joint function. Osteophytes, which are unwanted bone growths, may form as a result. The joint may develop a misalignment. This ailment is generally referred to as osteoarthritis. Osteoarthritis may also develop as a result of joint injuries, such as a fracture, or joint inflammation.

Inflammatory Arthritis:

A typical aspect of the body's healing process is inflammation. As a preventative measure against germs and viruses or as a reaction to wounds like burns, it frequently occurs. On the other hand, patients who have inflammatory arthritis experience inflammation that is not immediately obvious.

Damaged inflammation that does not naturally develop in response to injury or illness defines inflammatory arthritis. The damage caused by this sort of inflammation, which results in discomfort, stiffness, and swelling, is counterproductive and harmful to the afflicted joints.

Multiple joints may be affected by inflammatory arthritis, and the inflammation can harm both the bone under the skin and the joint's surface which also rheumatoid arthritis causes. Following are some examples of inflammatory arthritis:

- Rheumatoid arthritis
- Ankylosing spondylitis and psoriatic arthritis.

Childhood Arthritis

Numerous forms of arthritis may be mentioned here. The most typical kind of arthritis is juvenile idiopathic arthritis (JIA), also known as juvenile rheumatoid arthritis (JRA). There is no treatment for childhood arthritis, which can permanently damage joints. Remission, on the other hand, is conceivable and occurs when the illness is dormant. Immune system issues might be at blame.

Chronic Connective Tissue Disease (CTD)

Supporting, uniting, or dividing other bodily tissues and organs are the functions of connective tissues. Among them are cartilage, tendons, and ligaments. Inflammation and joint discomfort are symptoms of CTD. In addition to the skin, muscles, lungs, and kidneys, inflammation may also develop in other tissues, such as the lungs and muscles. CTD examples include

- Lupus, or SLE,
- Systemic sclerosis, also known as scleroderma
- dermatomyositis
- Sjogren's

Infectious Arthritis

Inflammation in joints can occasionally be brought on by bacteria, viruses, or fungi. Joint-infecting microbes include:

- Shigella and salmonella, which are transmitted through tainted or contaminated food
- Sexually transmitted illnesses including gonorrhoea and chlamydia (STDs)
- Hepatitis C, a blood-to-blood infection that can be contracted via receiving blood transfusions or using shared needles,

Antibiotics or other antimicrobial drugs might be prescribed by a doctor to treat a joint infection. On the other hand, if the infection has continued for a while, arthritis may occasionally turn chronic and the damage to the joints may be irreparable.

Metabolic Arthritis

When the body breaks down purine-containing compounds, urate is produced as a chemical. Human cells and several dietary sources contain purines. The majority of uric acid dissolves in the blood and is carried to the kidneys. Urine is produced thereafter, and it leaves the body. Some people have high amounts of uric acid because either their bodies naturally make

more than they require, or because their bodies cannot remove the uric acid rapidly enough.

Some individuals have a buildup of uric acid that results in the formation of needle-like crystals in the joint, which can cause rapid spikes in their level of acute joint pain or a gout attack. If the amounts of uric acid are not lowered, gout can either develop into a chronic condition or occur in episodes.

The big toe and hands are typical joints that are affected, along with a few other smaller joints. Typically, it has an impact on the extremities. According to one idea, uric acid crystals grow in joints that are colder and further from the body's core heat.

Septic Arthritis

An infection, either bacterial or fungal, can cause septic arthritis, an inflammation of the joints. Hip and knee joints are frequently impacted. It normally affects 2–6 people out of 100,000. A joint may become infected with a microbe directly through an injury or surgery, or it may become infected when bacteria or other disease-causing germs travel to a joint through the blood.

Most cases of acute septic arthritis are brought on by bacteria like Streptococcus, Staphylococcus, or Neisseria gonorrhoeae. Chronic septic arthritis is brought on by microbes like Candida albicans and Mycobacterium tuberculosis. Similar to acute septic arthritis, this is less frequent. The likelihood of getting septic arthritis is increased by the following conditions:

- Joint injury or illness currently present
- Inserts for artificial joints
- Infected with microorganisms somewhere else in the body
- Bacterial presence in the blood
- Chronic sickness or illness (such as diabetes, RA, and sickle cell disease)
- Drug usage by injection or intravenous (IV)
- Medicines that lower immune function
- Recently injured joint
- Recent arthroscopy or other surgery on a joint
- Disorders that reduce immunity, such as HIV
- Diabetes
- Older age

Common Symptoms of Arthritis

General symptoms include:

- Joint pain
- Limited ability to move the affected joint
- Redness
- Stiffness
- Swelling
- Warmth

Symptoms of Arthritis according to Types

Two of the most common osteoarthritis (OA) and rheumatoid arthritis (RA).

The different types of arthritis have the same general symptoms, like joint pain and stiffness, but the affected joints and other symptoms differ.

Osteoarthritis

OA is a disease that usually affects the hands, hips, and knees. Similar to other types of arthritis, OA symptoms include:

- Instability when walking
- Loss of movement
- Pain
- Stiffness

Symptoms are usually worse in the morning or upon standing up after sitting for a while. The pain usually improves within 30 minutes of movement.

Some people with OA may develop cysts (fluid-filled pockets) behind the knee. Swelling in the knee typically triggers the formation of cysts.

Rheumatoid Arthritis

RA is an autoimmune disorder, meaning the immune system attacks healthy cells. It can cause bone erosion and cartilage changes.[2]

These changes can lead to joint stiffness that lasts longer than 30 minutes and pain while moving and at rest. Symptoms often develop in the same joint on both sides of the body.

RA can also cause symptoms like:

- Fever
- Joints that are tender and warm to the touch
- Loss of appetite
- Nodules (round, hardened lumps) that may limit the range of motion and push your joints out of alignment
- Swelling, usually in your wrist, hands, and feet
- Tiredness

RA can also affect other organs, including the eyes, blood, and nerves, if it is untreated. It may cause scarring on the lungs that makes it hard to breathe.

Psoriatic Arthritis

Psoriatic arthritis (PsA) is an inflammatory disease that affects your joints and skin. It mainly affects the joints in your hands, wrists, and feet, and can also affect the elbows, spine, and other joints. You may have swelling and discomfort in these areas.[3]

PsA also causes changes to your skin, similar to psoriasis. You may have raised red, dry, and itchy areas of skin called plaques. They usually develop on the elbows or knees. PsA can also affect your nails.[5]2

PsA is a complex disease that causes widespread symptoms, such as:

- Changes to your bowel movements
- Depression or anxiety
- Difficulty sleeping
- Eye swelling
- Fatigue
- Hypertension (high blood pressure)

Ankylosing Spondylitis

Ankylosing spondylitis (AS) is an inflammatory disease that primarily affects the spine. It can also impact large joints, such as your shoulders and knees, and the joints in your hands and feet.[4]

Symptoms of AS may include:[5]

- Anxiety or depression
- Decreased mobility
- Hunched spine, which can make it hard to breathe
- Pain or stiffness in the affected areas, especially in the morning
- Trouble sleeping

In rare cases, AS may cause swollen fingers. Some people may develop osteoporosis (weak and brittle bones) in the spine.

Gout

Gout is a form of arthritis caused by the formation of uric acid crystals inside the joint. Alcohol, meat, seafood, and other foods rich in the chemical compound purine can trigger gout flares.

The most commonly affected joint is the big toe. The rest of your foot, ankle, and leg can also develop symptoms. You may have intense pain and swelling in these areas.

Some people may develop a tophus over the affected joint. This hardened deposit under the skin typically appears on the fingers or around the ears.

Etiology

The etiology of arthritis varies with the type of arthritis. In osteoarthritis, the major contributory factors include advancing age, female sex, joint trauma, and obesity. Some genetic factors have been described such as mutations in genes encoding types II, IV, V, and VI collagens.[6,7]

Rheumatoid arthritis (RA), on the other hand, is an autoimmune systemic inflammatory disorder.

In Gout, prolonged hyperuricemia leads to uric acid deposition in joints, which then leads to joint inflammation. There are several genetic mutations that can cause hyperuricemia, although this accounts for less than 10% of gout. The majority of patients with gout are under-excretors i.e. they are not able to get rid of all the uric acid that is produced in them as a result of endogenous or exogenous purine metabolism. Male sex, advancing age, chronic kidney disease, alcoholism, and certain drugs such as the diuretics are additional risk factors for hyperuricemia and gout.

Septic arthritis is acute arthritis that is rare in the general population, but patients with pre-existing risk factors such as immunodeficiency, advancing age, diabetes mellitus, prosthetic joints, rheumatoid arthritis, and intravenous drug abuse are at a higher risk.

Arthritis can frequently be seen in patients with other autoimmune diseases and is one of the most common clinical features in patients with systemic lupus erythematosus (SLE). Other diseases frequently associated with arthritis include inflammatory bowel disease, psoriasis, celiac disease, Sjogren syndrome, systemic sclerosis, dermatomyositis, mixed connective tissue disease (MCTD), etc.

Pathophysiology

Osteoarthritis is characterized by a degenerative cascade of progressive cartilage loss which leads to bone damage. Characteristic findings include subchondral cysts, osteophytes, and subchondral plate thickening. Interleukin-6, monokines, interferon-induced protein-10, and macrophage chemotactic protein induce proteolytic enzymes such as matrix metalloproteinases, serine proteases, and cysteine proteinases and result in the degradation of joint collage.[8] Calcification of the surrounding articular cartilage reduces the thickness of and eventually destroys the cartilaginous matrix. Old age also is associated with a decrement in chondrocyte function, enhancing susceptibility to osteoarthritic degeneration.

Symptoms of rheumatoid arthritis are typically more severe than those of osteoarthritis. Rheumatoid arthritis is a systemic and chronic inflammatory state caused by an autoimmune response to an environmental trigger.

Septic arthritis is typically an inflammatory response to a monobacterial infection. Bacterial entry into the synovial fluid triggers a release of cytokines, chemokines, and proteases that degrade cartilage and trigger hyperplasia of the synovial membrane. Toxins produced by bacteria play an additional destructive role within the joint space itself.

Epidemiology / Prevalence of Arthritis

According to WHO,

- In 2019, about 528 million people worldwide were living with osteoarthritis; an increase of 113% since 1990.
- About 73% of people living with osteoarthritis are older than 55 years, and 60% are female.
- With a prevalence of 365 million, the knee is the most frequently affected joint, followed by the hip and the hand.
- 344 million people living with osteoarthritis experience severity levels (moderate or severe) that could benefit from rehabilitation.
- With ageing populations and increasing rates of obesity and injury, the prevalence of osteoarthritis is expected to continue to increase globally.

Prevalence of Osteoarthritis in Pakistan rose from 2.85 million in 1990 to 8.49 million in 2021, with a 17.9% increase in age-standardized cases, disproportionately affecting women and urban areas. The prevalence of knee osteoarthritis contributes to over 61% of new cases, with rates significantly higher in women and in some studies showing a 18.13% overall prevalence with higher rates in rural regions (70.11%).

Over one-third of the American population has arthritis on imaging, and this number is bound to increase with the mean population age,[9] of the arthritides, osteoarthritis is most prevalent.

Between 19% and 30% of adults over the age of 45 years have knee osteoarthritis, 27% have osteoarthritis of the hand, and 27% have osteoarthritis of the hip. It is estimated that 40% of men and 47% of women will develop osteoarthritis in their lifetime, with the incidence increasing to 60% if they have a body mass index greater than 30.13.

Gout is the most common inflammatory arthritis in the United States, affecting more than 8 million individuals in the United States with a prevalence of 3.9%,[10] with a prevalence of more than 9% in individuals over 60 years of age.

Rheumatoid arthritis is found in approximately 1% of Caucasians, with females being affected more frequently than males (lifetime risk of 3.6% in women vs. 1.7% in men).[11]

Septic arthritis is typically caused by bacterial seeding of an already arthritic joint via the hematogenous spread, most often from skin or urinary tract infection. Septic arthritis has a prevalence of 0.01% in the general population and 0.7% in patients with rheumatoid arthritis.

Evaluation

History and physical examination plays a crucial role in the evaluation of arthritis and determining the type of arthritis, and differentiating symptoms from non-articular etiologies.

Usual symptoms of arthritis are pain, swelling, loss of function, stiffness, deformity, weakness, and instability. They may also be accompanied by fatigue, sleep disturbance, emotional liability and symptoms of the underlying systemic illness.

Physical examination is the most important tool in assessing arthritis and arthralgias. Inflammatory arthritis is associated with tenderness, swelling, effusion, erythema and warmth.

The next step shall be assessing the arthritis onset, the number of joints involved, symmetry, distribution, and pattern.

Laboratory and radiographic evaluation can assist in the diagnosis and grading of the severity of an arthritic condition.

Inflammatory arthritides are associated with an elevation in markers of inflammation (ESR and CRP). Anemia of chronic disease is common. Leukocytosis can be seen in septic arthritis as well as gout, pseudogout and Adult-onset Still disease, while leukopenia and thrombocytopenia can be seen in RA and SLE-associated arthritis. Serum uric acid may be elevated in patients with gout, although this shall not be the sole diagnostic criterion. Serologies such as rheumatoid factor, anti-citrullinated peptide antibodies, Anti-Nuclear antibodies, and more specific autoantibodies shall be performed when appropriately indicated to assist diagnosis.[12]

Plain radiographs shall be the initial imaging modality. Joint space narrowing, osteophytes and effusion are common findings in osteoarthritis.

If radiographs are non-diagnostic, further imaging can be considered. MRI is a very helpful tool and can assist in evaluating the presence or absence of synovitis, erosions, sacroiliitis with a much higher sensitivity than X-rays.

The synovial fluid examination is one of the most important tests especially for the initial diagnosis of arthritis.

A synovial biopsy is rarely performed but can be considered especially in cases of monoarthritis where other modalities have failed to provide a diagnosis.

Treatment / Management

The goals of arthritis symptoms and treatment include managing pain, reducing joint deterioration, and enhancing or maintaining function and quality of life.

Medication

The kind of arthritis will determine the medication. Typical medications include

Analgesics: They ease suffering. They do not, however, affect inflammation.

Anti-inflammatory medications that are not steroidal: These lessen discomfort as well as inflammation. Some NSAIDs are offered as patches, gels, or lotions that can be administered directly to the affected joints.

Counterirritants: The compound that gives hot peppers their fiery flavour, capsaicin, is included in several lotions and ointments. These can regulate pain signals from the joint and minimise discomfort when applied to the skin over an uncomfortable joint.

Antirheumatic medications that treat disease: The immune system's onslaught on the joints is slowed or stopped with DMARDs, which are used to treat RA.

Biologics: These medications have undergone genetic engineering and are designed to target different protein molecules involved in the immune response.

Corticosteroids: Inflammation is reduced and the immune system is suppressed by prednisone and cortisone.

Natural Solutions

People with arthritis can improve their general health and lessen the intensity of their symptoms by eating a healthy, balanced diet, getting enough exercise.

Natural Solutions are:

Diet: Consuming certain foods may assist to lessen inflammation. These meals provide several nutrients that are beneficial for joint health and can reduce joint inflammation.

- Fatty Fish
- Seeds and nuts
- Veggies and fruits
- Beans
- Olive oil

Polyunsaturated fatty acids, Berries, Cherries, Wholegrains, Vitamin D, E, Vit. B12 and Folate

Physical activity and treatment: Physical therapy is frequently advised by medical professionals to help

arthritis sufferers overcome certain difficulties and lessen movement restrictions. The following types of physical treatment might be suggested:

Physical therapy: Exercises that are customised to the illness and each person's demands are occasionally paired with pain-relieving therapies like cold or hot packs and massage.

Occupational therapy: Useful advice on managing daily duties, selecting specialised aids and equipment, preventing joints from additional injury, and controlling tiredness

Additionally, even though those who have arthritis may temporarily feel more pain when they start exercising, regular exercise can successfully lessen long-term symptoms.

Surgery

There may be a need for various surgical procedures on the damaged joints depending on the type of arthritis. Depending on the severity of a person's symptoms, and if previous therapies have been effective, it could vary. There are several arthritic surgery alternatives

Types of Surgery

- Synovectomy
- Complete replacement of joints
- Osteotomy
- Synovial fusion

Prevention

Arthritis patients may avoid the following:

Sugary treats
Refined carbohydrate
Food lead that are highly processed
Drinks with added sugars
Purines
Salty foods
Red meat
Alcohol
Fats and fried foods
Avoid smoking

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