

ARTHRITIS

ABSTRACT

Arthritis is the most common disease affecting the joints. There are many different types of arthritis but the two that are the most common are osteoarthritis and rheumatoid arthritis. Although osteoarthritis and rheumatoid arthritis are similar, there are significant differences between these types of arthritis. Rheumatoid arthritis typically affects the joints in the fingers, hands, and feet, not the hips, knees, or spine. The exact cause(s) of rheumatoid arthritis are not well-understood and the disease is not common. Osteoarthritis is relatively well-understood and common. Both osteoarthritis and rheumatoid arthritis affect the joints and there is no cure for either disease. Some surgical procedures are possible in the treatment for arthritis if the disease is not too advanced. Individuals with arthritis can be supported to pay attention to their diet and to avoid obesity as preventive strategies.

Learning Objectives:

1. Identify the correct definition of OA and RA.
2. Identify the body structures that are affected by OA and RA.
3. Identify the common causes of *osteoarthritis* (OA), and *rheumatoid arthritis* (RA).
4. Identify common signs and symptoms of OA and RA.
5. Describe the most important approach for working with a patient with OA or RA.

Introduction

Arthritis is the most common disease affecting the joints. There are many different types of arthritis but the two that are the most common are *osteoarthritis* (OA), and *rheumatoid arthritis* (RA). There are over 100 other forms of arthritis such as arthritis associated with the skin disease psoriasis, arthritis associated with the autoimmune disease lupus erythematosus, and septic arthritis but these types of arthritis and the other are much less common than OA and RA.

Osteoarthritis and Rheumatoid Arthritis

Osteoarthritis is a disease that causes damage to the joints. The most common areas of the body that are affected are the hip joints, the knee joints, and specific areas of the spine and feet. Osteoarthritis can be mild or severe. People with OA can have significant pain. The pain of OA, combined with the damage to the joints, can severely limit someone's ability to walk, move around, and to perform activities of daily living (ADL). Some degree of osteoarthritis is an inevitable part of getting older but the severity of the disease and the limitations it inflicts vary considerably.

Approximately 30 million Americans have some degree of OA, and it is expected that more and more people will develop the disease in the coming years. There are some clear risk factors that increase an individual's chances for developing osteoarthritis; however, no one knows exactly what causes the disease. Many people can live comfortably with some degree of OA, which may worsen over time. There is no cure for osteoarthritis.

Rheumatoid arthritis is also a disease that causes damage to the joints. Many people who have rheumatoid arthritis suffer from serious disabilities, and it also has no cure. Although OA and RA are similar because they affect the joints and there is no cure for either disease, there are significant differences between these types of arthritis.

Rheumatoid arthritis typically affects the joints in the fingers, hands, and feet, not the hips, knees, or spine. Osteoarthritis is relatively well-understood and common. The exact cause(s) of rheumatoid arthritis are not well-understood, and the disease is not common. Rheumatoid arthritis only affects approximately 1% of the population. Unlike OA, RA is associated with serious medical complications and an increased risk of death.

The term arthritis is a combination of two medical terms. *Arthro-* is a prefix that means “*of or relating to the joints*” and *-itis* is a suffix that means “*inflammation*”.

Musculoskeletal System Review

Osteoarthritis and rheumatoid arthritis cause damage to the joints. In order to understand OA and RA and what happens to the affected joints, it is necessary to understand some basics about the musculoskeletal system.

The skeleton consists of bones. The bones give the body structure, shape, and support. The bones meet at various places and these areas are called articulations, or more commonly, joints. Some of the joints in the body are complicated but many are simple, much like the hinge

on a door. Whether they are simple or complicated, all joints have similarities.

Firstly, where the end of one bone meets the end of another bone at the joint, there is a material called cartilage. Cartilage is a tough, thick, tissue that is like dense and compact foam rubber. The cartilage provides cushioning and a smooth surface so that the ends of the bones do not grind against each other when the joint moves.

Secondly, the *ligaments* support the joints and hold them together. The ligaments, like the cartilage, are thick, dense, and strong connective tissue structures. They cross a joint, hold it together, and prevent the joint from being moved too far and causing injury.

A useful way of imagining what the ligaments are and what they do is to imagine a door with a hinge. The doorway and the door would represent the bones of a joint. The hinge would represent the ligaments, holding the door together and allowing it to move but not move too far.

The other part of the musculoskeletal system that is important to know about is the tendon. Tendons are like ligaments in shape and structure - long, thick, dense, and not easily stretched. The function of the tendons is to attach the ends of muscles to bone.

The ligaments, bones, tendons and cartilage are all part of the musculoskeletal system. Collectively they are called *connective tissue*. Connective tissue is strong. It can resist a lot of force and recover from trauma. However, when connective tissue becomes damaged, it can be slow to heal.

The connective tissues do not have ample blood supply like the muscles do. A good blood supply is essential for healing. This lack of blood supply is a peripheral reason why arthritis can be difficult to treat and may be one of the reasons why it worsens instead of getting better. The other area of connective tissue, specifically the bones and cartilage, develops arthritis because the bones are constantly wearing down and losing minerals. The body has adaptive mechanisms that function to rebuild bones and keep them healthy and strong. During arthritis, especially in osteoarthritis, the bone breaks down faster than the repair mechanisms can rebuild it.

Connective tissue can be defined as a type of tissue that supports, connects, or separates the tissues and organs of the body. The bones, cartilage, ligaments, and tendons, are among the most important connective tissues in the musculoskeletal system but there is connective tissue in many other parts of the body as well.

Prevalence and Cause of Arthritis

Osteoarthritis is the most common disease of the joints. Approximately 30 million people in the United States have OA and it affects almost everyone as they get older. An estimated 40% of people aged 55 to 64 years of age have some evidence of OA, and approximately 100% of the population over the age of 75 has some evidence of the disease that can be seen on an X-ray. Osteoarthritis is found in men and women but after the age of 55 it is more commonly seen in women.

The number of people who have OA has been steadily increasing. Many experts feel this is due to the growing incidence of obesity. It

may also be due to the aging of the population. It has been predicted that by the year 2020, the number of people with OA may increase 60 percent to 100 percent.

Rheumatoid arthritis is much less common than OA and is 2 to 3 times more common in women than in men. The chances of developing RA increase as a person ages but is not a disease that is associated with the wear and tear of aging in contrast to osteoarthritis. Most people who develop rheumatoid arthritis do so in their 30s and early 50s.

Osteoarthritis

There is no single factor that causes osteoarthritis. It happens as a result of a person's genetics, lifestyle, age and gender.

Genetics:

It seems apparent that the risk of someone developing OA is higher if that person's parents or close relatives had OA. Osteoarthritis can also be "inherited" in specific joints such as the hands and hips. No one is exactly certain why this happens. It may be that people inherit weaknesses in the joints or the supporting structures around the joints. They may inherit the tendency to gain weight and weak joints.

Age:

There is one indisputable fact about OA; as people age, they are more likely to have the disease. There is no doubt about the association with increasing age and OA but no one knows why most people develop some degree of OA as they get older. Age itself is not an explanation for the development of OA. Among older adults who have OA, it may

be that the joints, muscles and connective tissues associated with them simply wear out with time. It is also possible that the regenerative mechanisms that repair the bones and other connective tissues cannot function as well as they once did. If this happens, the balance between breakdown and repair is lost with connective tissue breakdown predominating.

Another possible reason for the association between old age and osteoarthritis is declining levels of physical activity. Most people become less physically active as they age and a sedentary lifestyle does increase the risk of developing OA.

Gender:

Up to a certain age, OA affects men and women almost equally. However, after the age of 55, OA becomes more common in women. Women are more likely than men to develop OA in the fingers and the knees.

Obesity:

Obesity is defined as a body weight that is greater than 20% of the ideal weight, adjusted for height. Obesity has long been recognized as a risk factor for developing OA, especially OA of the knee. Obesity is a causal factor for OA because increased weight upon the joint leads to greater stress upon the knee that will increase the likelihood of bones, cartilage and ligaments of the joint breaking down.

It has been estimated that an increase of one pound of body weight increases the stress on the knee three- to six-fold. Obese people are

generally sedentary and inactivity increases the risk of OA. Research has shown that obesity stimulates a chronic, low-level state of inflammation in the body. The joints of someone who is obese are already being stressed and are more susceptible to the destructive effects of this chronic, widespread inflammation. Women who are obese are more likely to develop OA and the severity of the OA is worse for obese women.

Lifestyle Factors:

Trauma, a sedentary lifestyle, and repetitive stress (such as found in certain occupations in which a single movement or movements are repeated all day long) can increase a person's risk for developing OA. A major injury to a joint will predispose someone to development of OA in that joint. A joint injury that causes pain or swelling that lasts for more than a few days, or a diagnosed sprain, would be considered a major injury.

Repetitive exercise such as running does not appear to increase the risk of developing OA unless someone practices the sport at a high level, or if someone who has had a major joint injury becomes an avid runner.

Rheumatoid Arthritis

Rheumatoid arthritis is a chronic disease that is characterized by persistent, widespread inflammation that affects the joints. The exact cause of RA is not known but RA is clearly an autoimmune disorder. What initiates this autoimmune process is likely due to several factors: gender, genetics, infection, or other environmental or lifestyle triggers.

Genetics:

There is no doubt that RA is, in part, an inherited disease. It has been estimated that genetics account for approximately 50% of the risk of developing RA. For example, a first-degree relative of someone who has RA is 10 times as likely to develop RA as someone who does not have first-degree relatives with RA.

Gender:

Women are more likely to develop RA than men. There is some evidence that this increased risk for women to develop RA may be linked to sex hormones. The onset and intensity of RA symptoms are affected by pregnancy and the use of oral contraceptives.

Infection:

It is possible that RA may be caused by an infection from certain viruses. For example, the Epstein-Barr virus is more common in people who have RA than in people who do not. However, these viruses are found in many people who do not develop RA, so infection with a virus probably causes RA only in people who are susceptible to the disease.

Lifestyle Factors:

Cigarette smoking has been clearly identified as a risk factor for the development of RA. It has been estimated that cigarette smoking increases the chances of developing RA by almost three-fold.

These risk factors increase the chances that someone will develop RA; they are "triggers" that initiate the autoimmune process. It is the

autoimmune process that is responsible for the chronic inflammation that causes the signs, symptoms, and joint destruction of RA.

The body has defenses against infection and trauma. One of these defenses is the *immune system*. The immune system is made of specialized cells and blood components that attack and neutralize harmful bacteria, and viruses. However, sometimes the immune system malfunctions and starts attacking normal structures and tissues. This condition is called an autoimmune disease. Many autoimmune diseases are caused by an environmental trigger that starts the autoimmune process in a susceptible person. Autoimmune diseases are common; multiple sclerosis, RA, psoriasis, and Type I diabetes are all autoimmune diseases.

Joint Condition

The bones, ligaments, and cartilage in the joints are like every other part of the body. They require blood and nutrients to stay healthy. They also break down and must be replaced. For instance, the cartilage that lines the ends of the bones, where two bones meet, wears out periodically and new cartilage must be formed. This process is like the way the surface of the skin is always dying, being lost, and replaced. However, this process of breakdown and replacement gets disrupted in OA and RA. In OA, the cartilage, bone, and ligaments break down slightly faster than normal, and the replacement does not happen as quickly as it should. In RA, the connective tissue is actively destroyed by infection or an autoimmune process, and it does not get replaced. In either situation, the joints become affected. The bone breaks down, the cartilage is not replaced, and the ligaments get weak

and loose. Often, the joint gets scarred and inflamed. The result is a joint that is weak, painful, and difficult to move.

The breakdown processes and joint damage that occur in OA and RA are made worse by a limited blood supply to bones, cartilage, and ligaments. Healing in any part of the body requires an adequate blood supply. Normally, the blood supply to the connective tissue of the joints is sufficient to stimulate healing and repair. When someone has OA or RA, the limited blood supply is one of the reasons that the healing process in connective tissue is slow. The breakdown happens faster than the healing and the joint never recovers.

Signs and Symptoms of Arthritis

The signs and symptoms of OA and RA are basically the same, but there are some important differences between the two diseases. The most common signs and symptoms of OA and RA are 1) pain in the joints, 2) swelling of the joints, 3) pain when moving the joints, and 4) limited range of motion of the joints. Someone who has OA or RA has joints that are painful, swollen, hurt to move, and cannot be moved normally. The basic signs and symptoms are common for both OA and RA. The differences between OA and RA signs and symptoms are highlighted below.

Rheumatoid Arthritis

Rheumatoid arthritis tends to affect the joints of the hands, fingers and feet. RA produces more pain and disabilities than OA and progresses much faster than OA. Most people with RA have signs and symptoms but many people with OA do not.

There are serious complications associated with RA and people with RA have a shortened life expectancy. People with RA often have generalized symptoms such as fatigue and malaise. RA can also cause heart, kidney, and lung problems. Rheumatoid arthritis can cause fibrosis of the lungs, pericarditis (inflammation of the fluid filled sac that surrounds the heart), and people who have RA are more likely to develop atherosclerosis or suffer a myocardial infarction or stroke. Rheumatoid arthritis shortens life expectancy.

Approximately 30-40% of people with RA develop subcutaneous nodules. These are small collections of fibrous tissue that form over certain joints. The joints of people who have RA may be visibly deformed. Morning pain is more common in RA than it is in OA. This pain is eased by exercise, but for people who have OA, the morning pain is made worse by exercise.

Osteoarthritis

Osteoarthritis progresses much slower than RA. A large percentage of people with OA will initially have no signs and symptoms or minimal signs and symptoms. Osteoarthritis does not produce serious complications and people with OA have a normal life expectancy.

The pain of OA is brought on by exercise and relieved by rest. People with OA have stiffness in the morning or after a long period of inactivity, such as watching television for several hours.

After a certain age, OA affects almost everyone. This is not true of RA. Some people do not know they have OA until a physician diagnoses it

during a physical examination or sees the signs of OA on X-ray. This is especially true for patients who have no signs or symptoms of OA, or if the signs or symptoms are minimal. Rheumatoid arthritis is different in that it produces more pain and symptoms, and can lead to serious complications.

Treatment of Arthritis

People with osteoarthritis and rheumatoid arthritis do not simply have a disability that prevents them from living a vigorous, athletic lifestyle. People with OA, and especially RA, often have pain and a level of dysfunction that prevents them from performing simple physical tasks. Someone with OA or RA will often have great difficulty in walking, getting out of bed, using a computer keyboard, stretching, opening a jar, and turning a key in a lock. For some people, at certain times of the day, these simple activities may be too painful to perform.

Aside from some surgical procedures, there are no cures for OA or RA. Cases of OA and RA are often too far advanced to be treated with surgery since the affected joints cannot be surgically repaired. Weight loss can reduce the risk of developing OA but dieting can be a challenge for some people.

Despite the guarded p there has been considerable progress made in the number and effectiveness of the treatments that can be used for OA and RA. For example, in the past, RA often produced crippling joint deformities but with early diagnosis, early treatment, and more treatment options, this scenario is seen less often. With early detection, lifestyle changes, and the right treatments, OA and RA are diseases that can be managed.

Osteoarthritis

The goals of treatment for OA are to decrease the pain, improve function, and improve the patient's quality of life. The therapies for OA can be separated into four categories: 1) medical and lifestyle treatments, 2) pharmacologic treatments, 3) surgical treatments, and 4) alternative therapies. As with any disease, the simplest and least invasive therapies are tried first; however, depending on the patient's level of pain and functional disabilities, a combination approach or aggressive treatment may be needed.

Medical and Lifestyle Treatments:

When possible, the medical and lifestyle treatments should be tried first for the patient who has OA. These therapies are non-invasive and do not have side effects and some of them, such as exercise and weight loss, have beneficial health effects aside from decreasing OA pain. The first step is to determine the activities that are causing the most pain and then avoid or change them. This may sound simple to do but can be challenging. Occupational therapists and physical therapists can be of great assistance in this area.

Next, an exercise program should be started and the program should include aerobic exercise and strength exercises. The strength exercises should be traditional weight-bearing exercises that have a lifting and lowering component. Except for warming up, range of motion exercises are not useful. This program can be designed by a physical therapist and tailored for the patient's abilities.

Exercise is an important part of the treatment of OA as it has been shown to decrease pain *and* improve function. Exercise also strengthens the muscles around the affected joints and this helps decrease stress on painful joints. Along with the exercise program, patients who are obese should be encouraged to lose weight. There is no special diet recommended for patients who have OA.

Finally, the load and stress on joints affected by OA can be reduced by using supportive devices such as splints or assistive devices such as a cane or a walker. People with OA and RA have joints that are painful and have limited range of motion. It is natural in that situation to want to limit activity, however this weakens the muscles supporting the joints. That puts more stress on the joints and damages the joint even further. Although many people with OA and RA find exercise difficult and uncomfortable, every effort should be made to encourage these people to follow the exercise program prescribed by the physician and the physical therapist.

Pharmacologic Treatments:

Some patients who have OA may only need medications for OA flare ups or when performing certain physical tasks while other patients may need to take daily medications. The most commonly used medications for treating OA pain are acetaminophen (Tylenol), non-steroidal anti-inflammatories such as ibuprofen (Motrin) or naproxen (Aleve) and COX-2 inhibitors such as Celebrex. The choice of drug will depend on the specifics of each case, but most physicians will first recommend acetaminophen.

Acetaminophen has been shown to be not quite as effective as the other choices for the relief of OA pain. However, it is still a good

treatment for OA pain and the side effects of acetaminophen are far less severe than those of the non-steroidal anti-inflammatories and the COX-2 inhibitors. Ibuprofen and naproxen are very good analgesics and they have the added benefit of reducing the level of inflammation; but, for many people who have OA, especially elderly patients, these medications can be risky because they can cause gastrointestinal bleeding and kidney damage, and using these drugs requires close monitoring. These adverse effects can be prevented or managed but if acetaminophen provides pain relief it is a better choice as there are almost no side effects if used properly.

Celebrex is also very effective at relieving OA pain, but its use has been associated with an increased risk of developing heart disease, which is a concern given that many people with OA are elderly. Injections into the joints with glucocorticoids such as prednisone may help if the patient is having a particularly painful flare up. The glucocorticoids reduce inflammation very effectively, but they do not provide long-lasting relief. Narcotic analgesics such as codeine or oxycodone or medications that combine acetaminophen and narcotic (Percocet) can be used sparingly for severe pain.

Finally, some patients find that the over-the-counter medications glucosamine-chondroitin capsules and capsaicin cream help with their OA pain. However, controlled clinical studies have shown that these are no better than placebo. Glucosamine-chondroitin and capsaicin are very safe and they are not harmful unless they prevent the patient from using a therapy that has been proven to work.

Surgery:

Surgery is an option for people who have OA and do not respond to medical or lifestyle treatments or medications and who are experiencing considerable pain and loss of function. Surgery for OA is most often performed for people who have OA of the hips or knees. The operations are generally very successful; the failure rate is approximately 1% although it is higher in patients who are obese.

The great majority of patients who have a hip or knee replaced regain a considerable amount of function and mobility and quite a bit of pain relief, as well. The key to success when replacing a hip or a knee is timing. It is best if the operation is done while the patient still has a limited amount of joint damage and not too much loss of muscle strength. Joint replacements typically last for 10-15 years before they need to be redone.

Alternative Therapies:

Ultrasound, acupuncture, the application of heat and/or cold, and massage therapy have all been shown to be helpful for relieving OA pain.

Rheumatoid Arthritis

Rheumatoid arthritis is a persistent and progressive disease. Some people with RA will have periods during which the pain is much worse and periods during which it is much better; their symptoms will wax and wane. Occasionally RA will progress to a certain point and then stabilize and not get worse but for most RA sufferers, the discomfort and loss of functional ability worsen slowly over time.

Treatments for RA include medical and lifestyle therapies, and pharmacologic treatments. Surgery may be helpful. The current approach to treating RA focuses on early detection, aggressive treatment, and an individualized approach. Rheumatoid arthritis pain can be controlled if it is diagnosed in its early stages, and if the patient begins treatment right away. The best outcomes are achieved if the treating physician and the patient are willing to be flexible and try different treatments to find what works best.

Medical and Lifestyle Treatments:

The medical and lifestyle therapies that are used to treat RA are essentially the same as the ones used to treat OA. Weight loss is less of an issue since RA more often affects the joints of the hands and the wrists. Avoidance or alteration of activities that cause pain, exercise, and the use of splints and other supportive/assistive devices are all used to treat RA.

Pharmacologic Treatments:

Acetaminophen and the non-steroidal anti-inflammatories can be used to treat RA but they are not the first-line choices. Narcotic analgesics and prednisone injections can also be used. However, the most effective drugs for treating RA are drugs that decrease inflammation and drugs that alter the autoimmune process of RA.

There is a very wide variety of drugs of these types that can be used. A common example is people with RA will be given methotrexate (Rheumatrex) or methotrexate in combination with other medications

such as rituximab (Rituxan). These drug combinations have been proven to slow the progression of RA and prevent joint destruction.

Surgery:

In specific cases of RA surgery may be helpful. There are many procedures that can be performed, and it is beyond the scope here to discuss them in detail.

Monitoring for Complications:

Unlike OA, RA is associated with many serious complications. People who have RA often have anemia. They are at greater risk for developing osteoporosis than the general population. Heart disease, pulmonary disease, and stroke are more common in people who have RA than in people without the disease, and people who have RA are twice as likely to die of a heart attack. Also, many of the drugs that are prescribed for RA have serious side effects.

Managing Care for Arthritis Patients

It is not difficult to work with a patient with OA or RA. It does require some patience and a basic understanding of these diseases. Perhaps the most important point to remember is that a person with OA and RA is often unable to perform simple physical tasks. Also, there may be times when a person with OA and RA can perform a task but it may take the person longer to prepare for and complete the activity. This is where the CNA is most helpful; a large area of responsibility for a CNA who is working with someone who has OA or RA is the area of physical activity, for example, movements and transfers.

In order to make the experience successful for the CNA and patient, the CNA should work with the patient and make plans. This is vital. A plan should be made with the patient's input – for every physical activity. If a CNA plans out physical activities with the patient's input, the activity will be accomplished much smoother and with a minimal amount of pain and frustration.

Other Resources

Two good sources of information about OA and RA are the Arthritis Foundation at www.arthritis.org and the Centers for Disease Control and Prevention (CDC) at <http://www.cdc.gov/arthritis/>.

Summary

Two of the most common types of arthritis are osteoarthritis and rheumatoid arthritis. There are similarities between the two arthritic conditions and there are also significant differences between them. Rheumatoid arthritis typically affects the joints in the fingers, hands, and feet, not the hips, knees, or spine. The exact cause(s) of rheumatoid arthritis are not well-understood, and the disease is not common, whereas osteoarthritis is relatively well-understood and common.

Osteoarthritis and rheumatoid arthritis are typically progressive diseases. There are no cures for these conditions. Nonsurgical treatments for OA or RA usually do not provide long-lasting relief from pain; they simply make OA and RA easier to live with and slow the progression.

The medical treatments, the lifestyle changes, and the medications can be very effective but it can be difficult for someone who has OA or RA to lose weight, to change activities, and to start an exercise program. Although OA and RA can be managed, doing so may require the patient to tolerate some short-term discomfort for some long-term benefits. It may be painful to exercise a joint that is afflicted with OA or RA but if that joint is not exercised the pain will eventually be worse and functional disabilities will be much more likely to occur.

Good sources of information about OA and RA are available for the CNA, other clinicians and patients through the Arthritis Foundation and Centers for Disease Control and Prevention.