

Pseudogout is a disease that causes joint inflammation and arthritis. If someone develops pseudogout, they form and react to calcium pyrophosphate (CPP) crystals. These crystals can deposit in the joints and soft tissues. Pseudogout is also called calcium pyrophosphate disease (CPPD). Chondrocalcinosis is another word used to describe these calcium crystals. It is considered a rheumatologic condition.

This condition affects the body in a similar way to gout in hands. In each of these crystal forming conditions, the body's reaction to the crystals can result in cartilage and soft tissue damage.

Causes

The reason that the crystals form is unknown. There may be a genetic cause. This means you inherited a way your body processes calcium crystals. Certain risk factors are seen with pseudogout. For example, it occurs more often in men over 60 years of age. Other risks include thyroid disorders, kidney failure, or disorders of calcium or iron metabolism.

Sudden attacks of pseudogout are related to the release of crystals within the joint fluid. These crystals are attacked by the body's own defense cells. Polymorphonuclear neutrophils (PMNs) are a type of white blood cell. White blood cells often fight infection. But, they also react to the crystals. Macrophages are another type of white blood cell that ingest bacteria and crystals. These white blood cells often release toxic chemicals designed to kill bacteria. These chemicals can accidentally injure the surrounding tissue and cartilage, causing inflammation that results in severe pain, swelling and redness.

Signs and Symptoms

In pseudogout, patients will experience symptoms similar to gout. Episodes or attacks of swelling, pain and redness of joints are common (Figure 1). Pseudogout often affects the wrists and hands but can happen in any joint. These episodes can be confused with infection.

Diagnoses

The diagnosis of pseudogout can be tricky. Your doctor will ask about your pain and medical history. They will examine many of your joints. This will include joints that hurt and ones that do not hurt to look for patterns. The doctor may order x-rays of an involved joint, which may show crystal deposits within the soft tissue (Figure 2). The most definitive way to make the diagnosis is to remove fluid from a joint and analyze it in a lab. This is very



Figure 1: Acute pseudogout episode with a swollen, red and painful finger

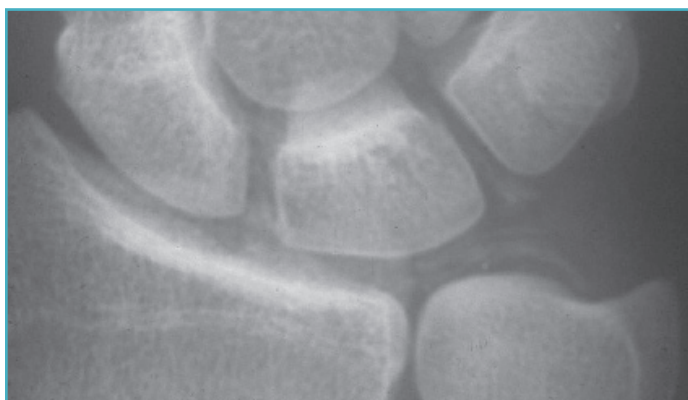


Figure 2: An x-ray of the wrist can show fluffy white deposits like those shown here.

important to help distinguish it from an infection. Gout and pseudogout crystals can be seen with a microscope. Each type of crystal looks different when viewed in a special polarized light. Each crystal has a unique shape and appearance. Gout crystals are shaped like a needle, while pseudogout crystals are rhomboid shaped. If there are no bacteria seen under the microscope, it suggests there may not be an infection. With no bacteria, definite calcium crystals, and PMNs, this pattern suggests pseudogout is present. Sometimes both a crystal problem and an infection can coexist.

The x-rays can also be helpful, as they show different changes. Gout eats away at the bones and joints of the hand and wrist. This is noticed with many small cystic erosions in the bones at the joint surfaces. An x-ray showing pseudogout may show calcification in the soft tissues around the joints. Blood levels of urate are often elevated in gout, and uric acid is normal in pseudogout.

The white blood cell count (WBC) may be elevated in these conditions. Finally, it is helpful to check kidney function. Many of the drug treatments for pseudogout can be impacted by whether kidney function is normal or reduced. Therefore, it is important to know the health of the kidneys when recommending treatments.

Treatment

Initial treatment includes rest and ice to the painful joint. There is no medication that can directly reduce the amount of crystals in tissue. However, there are treatment options that can improve pain and inflammation. They include:

- **Edema (swelling from extra fluid) control:** It can be helpful to use a light compression wrap to reduce swelling. When swelling is severe, the extra fluid makes it difficult to move the joint. It is better to prevent the swelling before it occurs; however, in most cases, swelling has already occurred by the time the patient seeks medical care. If this is the case, it's important to reduce swelling quickly to improve function. Ice and elevation can improve the swelling. And, as soon as pain permits, motion improves swelling. Therapy is very helpful to get the joints moving again.
- **Splints:** Splints can improve pain by limiting painful joint and tendon motion. They should only be used for a short time. Longer use can result in stiffness.
- **NSAID medications (ibuprofen or naproxen):** These medications are a good option to reduce swelling and pain. However, these may have some risk in elderly patients. NSAIDs can injure the kidneys (kidney function decreases with age). NSAIDs can also decrease function of platelets, which may negatively affect patients taking blood thinners. However, NSAIDs are very commonly used, effective, and safe when prescribed and monitored by a health care provider.
- **Steroids:** These medications are one of the most common and effective treatments and can be given by different routes. Depending on the severity of the pseudogout, milder attacks may be treated by pills taken by mouth. More severe cases may benefit from steroids given by injection. Steroids can have some side effects. In diabetics they can increase blood sugar. Sometimes a lower dose steroid can result in fewer side effects.
- **Colchicine:** This medication pill can be used to treat a painful attack. In severely painful joints, it is used at higher doses. One side effect may be diarrhea. If this happens, the dose can be reduced. Low dose colchicine can be used daily to hopefully prevent future attacks.
- **Immunosuppressive medications:** Stronger immunosuppressive medications can be used when other medications are not successful. They may include methotrexate, hydroxychloroquine, or interleukin 1beta inhibitors. These medicines have higher side effects. They need to be managed by an experienced health care provider.
- **Surgery:** This is rarely performed for this condition early on. If the patient is in severe pain and other medications are not working or cannot be used, a small surgery can be performed. The joint can be opened to remove the majority of crystals. If this is a first attack or a newly symptomatic joint, the crystals can be sent to the lab for analysis. By reducing the number of crystals in the painful tissue, lower doses of medication may be more effective. Surgery can establish or confirm a diagnosis, improve pain, and reduce cartilage damage. Surgery may also reduce the risk of arthritis, which can develop after several gout attacks.
- **Magnesium supplements:** There is a small chance that these supplements taken daily could decrease chances of developing pseudogout.