



# IMMUNE RESTORATION SYNDROME

## WHAT IS IMMUNE RESTORATION SYNDROME?

Some people who start antiretroviral therapy (ART) get health problems even though their HIV comes under control. An infection that they previously had might return. In other cases, they develop a new disease. This is linked to improvements in the patients' immune systems. The problems usually occur in the first two months after starting HIV therapy. This condition is sometimes called Immune Restoration Inflammatory Syndrome or IRIS. It may occur in about 20% of people starting ART.

## HOW WAS THE SYNDROME IDENTIFIED?

Several patients developed cytomegalovirus (CMV) *after* they started HIV treatment. See Fact Sheet 504 for more information on CMV. In some cases, these patients had not been diagnosed with CMV before they started HIV treatments.

Doctors concluded that these patients were infected with CMV before their HIV treatment. However, their immune systems had been too weak to react to the CMV. When they started HIV treatment, their immune systems got stronger. Then they responded to the CMV. That's when the patients developed what looked like a new case of CMV disease.

There were similar cases in other patients and with different infections. It was called "immune recovery syndrome." Some patients developed fever and swollen lymph nodes. Others had inflammation in various parts of their bodies. These problems showed up *after* the patients had a large increase in their CD4 counts (see Fact Sheet 124) and a large decrease in viral load (see Fact Sheet 125).

## BAD NEWS – OR GOOD NEWS?

No one wants to develop inflammation or an infection. However, most cases of

immune restoration syndrome go away with continued HIV treatment.

What's probably more important is in the name of the syndrome: immune restoration. It is a sign that the immune system is getting stronger. It also shows that the immune system is responding to specific germs. Before HIV treatment, there might have been no response to these germs because the immune system was too weak.

## WHAT PROBLEMS CAN OCCUR?

Immune restoration syndrome has been linked with the following types of infections or inflammation:

**Cytomegalovirus:** The first cases of immune restoration syndrome showed up as inflammation in the eyes. This is linked to cytomegalovirus, as noted earlier.

**Hepatitis B and C:** Some of these were cases of hepatitis C that had not previously been diagnosed. Fact Sheets 506 and 507 have more information about hepatitis.

**Herpes Zoster (Shingles) and Herpes Simplex** outbreaks. Fact Sheet 509 has more information on shingles. Fact Sheet 508 discusses herpes simplex (cold sores and genital herpes.)

**Molluscum** (a skin infection. See fact sheet 513).

**Mycobacterium Avium Complex (MAC):** This opportunistic infection is related to tuberculosis. It can flare up during immune recovery. MAC during immune recovery may show unusual symptoms. Fact Sheet 514 has more information on MAC.

**Progressive multifocal leucoencephalopathy (PML):** See Fact Sheet 516 for a description of this viral brain infection. Immune recovery can cause a serious worsening of PML.

**Swollen lymph nodes**, also called "lymphadenopathy." This can indicate general immune activation.

**Tuberculosis:** See Fact sheet 518 for more information on tuberculosis.

## HOW IS THE SYNDROME TREATED?

There is no specific treatment for immune restoration syndrome. Continued HIV treatment strengthens the immune system. This normally takes care of any infections that emerge.

However, in some cases, doctors slowed down the recovery of the immune system. By gradually increasing its strength, they avoided some of the immune restoration responses. This has mostly been tried in people who had very low CD4 cell counts before they started HIV treatment.

The immune response can be slowed down by using a steroid drug like prednisone. This can ease the inflammation while the immune system gets stronger.

## THE BOTTOM LINE

Immune restoration syndrome can occur when people with very weak immune systems start HIV treatment. If their immune system recovers quickly (higher CD4 cell counts and lower viral load), it might have a strong response to some germs that were already in the body. This normally shows up as some type of inflammation.

Several different opportunistic infections have been linked to immune restoration.

This syndrome is a sign of improving immune health. Normally it is not treated. Continuing HIV therapy takes care of any problems. In rare cases, the immune system can be suppressed with steroids to ease inflammation.

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