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Lactic Acidosis [1]

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Understanding Lactic Acidosis

Mitochondria are small organs inside your cells. They help convert energy in the food you eat into energy your body uses to function. Like solar cells that convert sunlight into electricity, mitochondria are power plants inside your cells that convert glucose (sugar) into usable energy. At the same time, lactic acid is made as a waste product. Normally, the body breaks down lactic acid and gets rid of it.

Certain HIV drugs in the nucleoside reverse transcriptase inhibitor (NRTI) class sometimes have negative side effects [2] that may lead to liver problems. One such side effect is damage to the mitochondria inside your cells, or mitochondrial toxicity. When mitochondria are damaged, lactic acid is not broken down. This can cause levels of lactic acid in your blood to rise. If the levels of lactic acid become too high, a rare, but serious condition called lactic acidosis can occur.

What Causes Lactic Acidosis?

Lactic acidosis can develop when your cells make too much lactic acid or when your liver is not working properly to get rid of it. Certain HIV drugs in the NRTI class can sometimes cause these problems:

- Cells make too much lactic acid: NRTIs can damage the mitochondria. This is known as mitochondrial toxicity. It can cause the mitochondria to have trouble making energy. Lactic acid is made by cells that are not getting enough energy from their mitochondria.
- The liver is not working properly: NRTIs can cause the liver to become fatty. A fatty liver does not work well and cannot break down lactate efficiently.

Lactic acidosis is a rare side effect of the NRTIs, especially Zerit (stavudine, d4T) and Videx (diadanosine, ddI).

Symptoms of Lactic Acidosis

The symptoms of lactic acidosis include:

- Persistent nausea, vomiting, and abdominal (belly) pain
- Unexplained tiredness
- Shortness of breath
- Rapid breathing
- Enlarged or tender liver
- Cold or blue hands and feet
- Abnormal heart beat
- Weight loss

It is important to get in touch with your health care provider right away if you experience these symptoms. Because lactic acidosis can be fatal, it is best to identify and treat it early.

Treatment

If your health care provider suspects that you have lactic acidosis, she or he will perform a physical exam to check for an enlarged liver and may order a CT scan or ultrasound of your liver. You will probably also have some blood tests done to measure your:

- Liver enzymes
- Electrolyte level
- Blood pH (the level of acid in your blood)
- Lactate level

Treatment will depend on your symptoms and lab test results:

- A normal lactate value is less than two mmol/dL. If your lactate value is more than two but less than five, and you have none of the symptoms of lactic acidosis, your health care provider will probably continue your HIV drugs.
- If your value is more than five, and you have symptoms of lactic acidosis, your health care provider will probably stop your HIV drugs, as the level of lactate in your blood is getting into the danger zone.
- If your value is more than ten, and you have symptoms, you definitely have lactic acidosis. Your health care provider should stop your HIV drugs and admit you to the hospital for treatment. Lactic acidosis at this stage is a medical emergency.

There is no proven treatment for lactic acidosis other than stopping the NRTIs that are causing it. In serious cases, hospitalization and supportive care, such as intravenous (IV) fluids and a machine to help you breathe, may also be needed.

Some health care providers recommend giving thiamine (vitamin B1), riboflavin (vitamin B2), L-carnitine, coenzyme Q, or vitamins C, E, and K to people with lactic acidosis. While some of these vitamins and supplements [3] have shown encouraging results in small studies, they

have not yet been proven to be effective.

It is important that you not stop taking any HIV drugs without talking with your health care provider. If you are diagnosed with lactic acidosis, your health care provider can help you decide how to stop your HIV drugs, when to restart, and which ones to take when you go back on treatment. If you have only slightly elevated lactate levels and no symptoms, you may not need to change your HIV treatment regimen.

Risk Factors

Certain factors put people at higher risk for lactic acidosis, including:

- Treatment with Videx and/or Zerit (when used together, the risk is even higher)
- Treatment with ribavirin (for hepatitis C [4])
- Treatment with Glucophage (metformin), which is used to control diabetes
- Obesity
- Female sex
- Poor liver function

Taking Care of Yourself

Because there is a connection between liver problems and lactic acidosis, it is important that your health care provider check your liver function while you are taking NRTIs, especially if you have a history of heavy alcohol use [5] or a liver problem.

Many people on HIV drugs have elevated lactate levels. It usually does not cause any problems. For that reason, it is not recommended that lactate tests be done on a regular basis. However, if you experience any of the symptoms of lactic acidosis described above, tell your health care provider immediately.

Although lactic acidosis can be life-threatening, it is also very rare. The point of learning about lactic acidosis is not to scare you. Rather, it is to help you be aware of important signs in your body that may indicate a serious problem. In this way, you will be better able to recognize symptoms of lactic acidosis, tell your health care provider right away, and get treatment if necessary.

Tags:

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- lactic acidosis and HIV [7]
- lactic acid [8]
- blood [9]
- nucleoside reverse transcriptase inhibitor [10]
- NRTI [11]
- mitochondrial toxicity [12]
- nausea [13]
- vomiting [14]
- muscle weakness [15]

- lactate values [16]

Additional Resources

Select the links below for additional material related to lactic acidosis.
Mitochondrial Toxicity (AIDS InfoNet) [17]
Less Common Side Effects (CATIE) [18]
Lactic Acidosis (AIDSmap) [19]
Mitochondrial Toxicity (AIDSmap) [20]
NRTI Drug Characteristics Table (DHHS antiretroviral guidelines) [21]

Source URL: http://www.thewellproject.org/hiv-information/lactic-acidosis?qt-activity_tabs=2

Links:
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