

Chaima Mohamed
Professor Serhiy Metenko
FIQWS Killing Stories - Writing Section
October 20,2022

Over Usage of Over the Counter Medication

You're having a terrible migraine the whole day so the first thing you do when you come back home is to immediately reach in for your advice. You grab two pills because they seem to work better than just one pill and after a few minutes you feel the rush of relief. You finally go along with your day without pain. About four out of five American adults use over the counter medicine such as tylenol, advil, ibuprofen to get rid of pain such as raging headaches, cramps, muscle aches, fever and so on.

It's an easy way to get rid of the pain and a quick fix without having to go through the process of visiting a doctor. It's easily accessible; you see them in supermarkets, bodegas, gas stations and anywhere near you. You can even have them shipped straight to your house. What many people don't understand and are not warned about is the dangers of overusing over the counter medications and their negative impact on the body. That bears the question of how safe are over the counter medications?

First we have to understand how these drugs work and how we even feel pain. As humans we have specialized nerve cells called nociceptors. Just like other nerve cells, nociceptors are all across your body from your heart, legs, arms, stomach and so on. Now nociceptors unlike your other nerve cells don't actually work unless something is causing damage or harm to your body. For example if you touch a wall you will feel it but you won't feel any pain. Now if you slap your hand on the wall really hard you will start feeling pain because your nociceptive nerves are traveling from your hand to your brain indicating that something is

harming or hurting your hand. But nociceptors are not the only thing in charge of alerting your body of pain. When cells are damaged they release a chemical called arachidonic acid. Then two enzymes called COX_1 and COX_2 convert the arachidonic acid into prostaglandin. The prostaglandin then converts into multiple other chemicals that have specific roles such as raising your temperature, causing inflammation, and pain sensitivity. Many people use medications such as tylenol, advil, and ibuprofen to subdue them and feel less to no pain.

Now how do over the counter medications such as tylenol, advil, ibuprofen and aspirin work. Well all enzymes work as a lock and key. That means for the enzyme to work it has to have a specific chemical to allow it to work. For example enzyme COX_1 can only work if arachidonic acid is attached to it because they fit like a lock and key and therefore can continue to produce prostaglandins which cause pain releasing chemicals.

Painkillers do the opposite, they obstruct the chemicals from entering the enzyme thus preventing it from converting and releasing pain causing chemicals. Not only do the painkillers obstruct the enzymes from releasing pain causing chemicals, they also obstruct nerve signals to the brain that alert us of pain in our body.

Now what happens to the painkiller medications after doing its job? Where does it go in the body? Well after 1-2 hours of full effectiveness of the medications the body starts eliminating the medication. Through the bloodstream again the particles of medication pass through the liver then the kidneys. Some drugs get through the process without any metabolic changes and get passed through as excreted bile. However other drugs are converted into metabolites while in the liver and then are passed through the kidneys and excreted as bile. The amount of excreted bile caused by these medications and converted metabolites can all fluctuate based on how much medication you take, your age and health issues such as diabetes.

Knowing that the liver and the kidneys are both part of our detoxification and filtration systems there should be a direct correlation between the amount of over the counter medications you take and the effect they may have on your liver and kidneys. When you take more than the required dose of any over the counter medication that has to be converted into metabolites, there can be an over reproduction of metabolites and once the liver starts storing these metabolites instead of filtering them out they turn into toxins. These toxins start accumulating in the liver over time and start changing structures of the liver making it incapable of doing its job and eventually this causes liver damage.

Kidneys filter out bile and water from the bloodstream through many blood vessels. These blood vessels are able to filter out waste. These blood vessels can narrow and widen to change the pressure in the filters. The amount of blood filtered is based upon the amount of pressure in these blood vessels. It is always best to keep the pressure in a healthy balance. When you are sick your body is already at a low body pressure which also causes the blood vessels in your kidneys to have low blood pressure. When you take medications such as ibuprofen, aleve or motrin those medications lower your blood pressure. When taken through a proper prescription from a doctor these medications are not as harmful but once they are being used without proper advising you run the risk of making your blood pressure so low your kidneys lose function and stop working.

Many people who are in desperate situations and need a quick fix for their health problems don't particularly think about the consequences of using over the counter medications without doctor advice. They most probably weren't even aware of how these drugs affected their body and how easily someone can overdose on these medications. The CDC said that "In 2016, 115 Americans died every day from an opioid overdose – that is more than 42,000 drug overdose

deaths”(blog administrator). In the journal “*Hepatology*” it has been mentioned that “ U.S. researchers found that over a six-year time span, more than 40 percent of acute liver failure cases were caused by an acetaminophen overdose. High doses of acetaminophen can cause liver injury, even to a healthy liver”(Cutler).As we further read multiple other stats we see that liver damage, kidney damage and overdosing on over the counter medications is more common than we think.

This can be caused by multiple factors such as taking prescription without doctor's advice, not reading instructions on medication bottles/boxes, mixing medications, and taking multiple pills to quickly fix your pain.