

Cannabis and How It Impacts Cancer Cells

Now it's time to talk about the very interesting, actually fascinating interaction between medical marijuana and cancer cells. We've known for 3000 years that marijuana seems to impact cancer cell growth. And we don't have any data yet on large, controlled, randomized trials in the human model. In fact, waiting for that data is going to take probably decades. So the data I'm going to share with you here is data obtained from animal models in the laboratory and also from direct laboratory analysis of the marijuana plant combined with cancer cells in a test tube or Petri dish where scientists are really able to dial down on the mechanism of interaction. The way that marijuana reduces a cellular growth and encourages cell death.

So we've known for a very long time that marijuana seems to have an effect on cancer growth. It wasn't until the 1970s that our first real research came through. It was on mice that had developed a lung adenocarcinoma. And in the mice that were treated with medical marijuana, there were reductions in both tumor growth and then also an increase in the life span of the mice. Now this was a small study and of course needed replication. And again, it's in a mice model. That was encouraging. Remember that there are cannabinoid receptors all over your entire body that are usually stimulated by the endogenous cannabinoids. The cannabinoids that already exist in your body. And those cannabinoid receptors include CBD1 receptors, primarily found in the brain and other organs, and also the CBD2 receptors that are found almost exclusively in the immune system and particularly in greatest density in your spleen.

Now there are three types of ways that we can stimulate that receptor. We can stimulate it through the endogenous cannabinoids that already exist in your body, or through plant derived cannabinoids from medical marijuana, or through the synthetic cannabinoids that are being manufactured in laboratory settings.

Now the hallmarks of cancer include unregulated cell growth and an inability of the cell to die, or a lack of apoptosis. Both of these occur from damage to the DNA that results in mutations that limit the cell's ability to be regulated in its growth and that limit the cell's ability to die. That's how you get these big tumors that kind of fall out of the usual range of ways that the body manages cell growth.

So medical marijuana appears to work in these rat models. And by the way, it's been proven to work in all kinds of rat models now. In breast cancer, cancer on the lymph system, skin, pancreatic, prostate cancer. And it makes sense because cancer all comes from these initial same genetic mutations. And if we can impact cell growth or impact the cellular apoptosis or cell death, then it really doesn't matter what the initial tumor cell, what particular organ it came from. But medication is going to work.

So the medical marijuana appears to reduce cellular proliferation by inhibiting the cyclic AMP protein kinase, which results in an activation in MAPKS and also in PA13K Akt systems. These systems are all enzymatic systems that are very involved in the transfer of energy within the

cells and in management of cell growth. The product also works by increasing cell death by stimulating ceramide synthesis, which up regulates P8 and moves the cell into a persistent cell cycle at the G1 phase of growth that limits the cell's ability for it to grow and pushes it toward an early death.

So through this decrease in cellular proliferation and an increase in cellular death, medical marijuana appears to have a beneficial effect on reducing the cancer burden in patients who are suffering from cancer.